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Message from the Chair

Dear Esteemed Guests, Speakers, and Participants,

It is my distinct pleasure to welcome you to this pivotal conference on *AI-Driven Business Innovation: Leveraging Financial Inclusion and Social Impact*. As we stand at the crossroads of technological advancement and societal transformation, the convergence of Artificial Intelligence (AI) with business innovation has the potential to reshape industries, empower underserved communities, and drive sustainable economic growth. AI has already proven to be a game-changer in many sectors, but its true promise lies in its ability to address some of the most pressing challenges we face today — particularly in the realms of financial inclusion and social impact. By harnessing the power of AI, we can enhance access to financial services for underserved populations, create more inclusive economic systems, and ensure that marginalized groups are not left behind in this digital revolution. At the heart of this transformation is the opportunity for businesses, governments, and social enterprises to collaborate, combining cutting-edge technology with a focus on equity, accessibility, and empowerment. Through AI-driven solutions, we can unlock new financial products, enhance credit access, reduce inequality, and create sustainable models of growth that benefit all of society, especially those who have traditionally been excluded from economic systems. This conference is an important platform for sharing knowledge, exchanging ideas, and forging partnerships that will help shape a future where technology serves as a powerful tool for social good. The discussions, presentations, and case studies that will unfold in the coming days offer a unique opportunity to explore innovative applications, success stories, and challenges in this exciting space. I encourage you all to actively participate, engage with thought leaders, and be inspired to think creatively about how we can leverage AI to drive both business success and positive social change.

Together, we can pave the way for a more inclusive and equitable future, where AI is not just a tool for innovation but a catalyst for meaningful and lasting social impact.

Thank you, and I look forward to a thought-provoking and enriching conference experience.

Warm regards,

Dr. Ahmed Muneeb Mehta
Principal/ Conference Chair

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KEYNOTE SPEAKERS

Mr. Syed Athar Abbas (Habib Insurance Ltd.)

Dr. Cagri Bulut (Turkey)

Dr. Bartlomiej Dessoulavy-Sliwinski (Poland)

Dr. Goh Khang Wen (Malaysia)

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CONFERENCE SCHEDULE

SESSION 1

Session: 1 (A) Date 03-12-2024 Time: 2:00 – 3:30 Room No. 42 Session Chair: Dr. Ahmad Usman Shahid (Australia) & Dr. Ali Fayyaz Munir Finance and CSR Room Coordinator: Dr. Waqas Baig			
SR#	Presenter's Name	Institute	Title of the Paper
1	Mr. Ramzi Abdullah Ahmed Hassan	Swami Ramanand Teerth Marathwada University Nanded City, Maharashtra, INDIA	Promoting Financial Inclusion in Yemen: Strategies and Recommendations
2	Faisal Hanif Tayyaba Jameel	Capital University of Science and Technology, Islamabad	Exploring the Effect of Supportive Leadership on Team Performance: The Role of Goal Clarity and Trust as Mediators
3	Dr. Ahmad Usman Shahid	International College of Management, Sydney, Australia	Access to Finance, Social Capital and the Improvement of Corporate Performance: Evidence from Southeast Asia
4	Mariyam Mustafa	Hailey College Banking and Finance, University of the Punjab	The Role of Green CSR in Determining Environmental Attitude towards Green Purchase Intention
5	Iraj Shahbaz	Hailey College Banking and Finance, University of the Punjab	Uncovering the Path to Socially Responsible Investment: The Role of Investor Characteristics and Social Investing Efficacy

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Session: 1 (B) Date 03-12-2024 Time: 2:00 – 3:30 Room No. 43 Session Chair: Prof. Dr. Hafiz Zafar Ahmad Banking and Economics Room Coordinator: Dr. Muhammad Usman			
SR#	Presenter's Name	Institute	Title of the Paper
1	Muhammad Adnan Riaz	Hailey College of Banking and Finance, University of the Punjab	A pathway of Employee's positive Energy towards Subjective Well-being by Grit and Flourishing as Mediation Variables
2	Mahnoor Asif	Hailey College of Banking and Finance, University of the Punjab	Perception Acceptance of Islamic Banking Products and Services: Analyzing Consumer Awareness Adoption
3	Muhammad Hassan Danish	University of Management and Technology, Lahore	Unraveling the nexus between Public Spending and Sustainable Development: A Dynamic Panel Data Analysis of Developing Countries
4	Saeeda Batool	Hailey College of Banking and Finance, University of the Punjab	Assessing the Impact of Digital Banking on Financial Inclusion in Developing Economies: The Mediating Role of Financial Literacy
5	Dr. Rizwan Qaiser Danish Dr. Hafiz Ahmed Ullah Farah Kainaat	Institute for Art Culture, Federally Chartered Degree Awarding Institute, Lahore, Pakistan Institute of Business Administration, University of the Punjab, Lahore, Pakistan	Investigating Employee Experiences and Satisfaction with E-Tax Systems in Emerging Economy
6	Rimsha	Hailey College of Banking and Finance, University of the Punjab	The Impact of Behavioral Biases on Investment Decisions: Mediated Moderated Model

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Session: 1 (C) Date 03-12-2024 Time: 2:00 – 3:30 Room No. 44 Session Chair: Dr. Rizwan Qaiser Danish & Dr. Amna (UCP) Innovation and Digitalization Room Coordinator: Ms. Rabia Saleem			
SR#	Presenter's Name	Institute	Title of the Paper
1	Dr. Ahmed Muneeb Mehta Dr. Rizwan Qaiser Danish Anita Ali	Hailey College of Banking and Finance, University of the Punjab	How Green Dynamic Capabilities Affect the Sustainable Performance: Mediating Role of Green Innovation
2	Dr. Rizwan Qaiser Danish Noor Fatima	Institute of Business Administration, University of the Punjab, Lahore, Pakistan	Investigation of Key Factors Affecting User Trust in Chatbots Customer Service Agents Among Pakistani Users
3	Rizwan Qaiser Danish Waqas Shakir Rehab Khan Muhammad Arslan Rabia Saadat Ali	Institute of Business Administration, University of the Punjab, Lahore, Pakistan	Green Banking Development in Pakistan: A way forward
4	Dr. Kashif Nadeem	Institute of Business Administration, University of the Punjab, Lahore, Pakistan	Digitalization and Sustainability: An Integrative Literature Review through Taxonomy Development
5	Rizwan Qaiser Danish Khyzer Bin Dost Zartasha Ghaffar Khan Nosheen Pervaiz Awan	Institute of Business Administration, University of the Punjab, Lahore, Pakistan	The Dynamic Linkage between Technological Innovation, Economic Growth and Environmental Degradation: A Case Study of Pakistan
6	Nimra Younas	Hailey College of Banking and Finance, University of the Punjab	Digital Transformation and its Impact on Circular Economy Practices and Environmental Performance: A Pathway to Green Competitive Advantage for SMEs

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Session: 1 (D) Date 03-12-2024 Time: 2:00 – 3:30 Room No. 45 Session Chair: Dr. Sania Zahra Malik & Dr. Adnan Hushmat CSR and Management Room Coordinator: Ms. Fareeha Waseem			
SR#	Presenter's Name	Institute	Title of the Paper
1	Shahzad Gul Maham Saleem Muhammad Kamran Altaf	University of Management and Technology, Lahore Riphah International University	Audit Committee Characteristics and Environmental Disclosure: Empirical Analysis
2	Dr. Rizwan Qaiser Danish Sakina Bashir	Institute of Business Administration, University of the Punjab	Impact of Ostracism and Staking on the Performance of healthcare Professionals with the Mediating Role of Quality of Life in Pakistani Context
3	Sohail Younas Dr. Rizwan Qaiser Danish	Department of Commerce, University of the Punjab Jhelum Campus	How Ethical Leadership affect the Performance of Police Department? A Mediation Mechanism of Work Stress
4	Dr. Rizwan Qaiser Danish Sehrish Amin Khan	Institute of Business Administration, University of The Punjab, Lahore, Pakistan.	Exploring the Relationship between Ethical Leadership and Employee Performance through the Lens of Emotional Intelligence
5	Sidra Mustafa	Hailey College of Banking and Finance, University of the Punjab	Analying the Impact of High Performance Work System on Employee's Response in Banking Sector

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Session: 1 (E) Date 03-12-2024 Time: 2:00 – 3:30 Room No. 06 Session Chair: Dr. Majid Ali & Dr. Muhammad Sajid Marketing and Management Room Coordinator: Ms. Anam Masood			
SR#	Presenter's Name	Institute	Title of the Paper
1	Rizwan Qaiser Danish Waqas Shakir Rehab Khan Muhammad Arslan Rabia Saadat Ali	Institute of Business Administration, University of The Punjab, Lahore, Pakistan	Consumer Participation with Brands and Loyalty: A Social Commerce Perspective
2	Dr. Rizwan Qaiser Danish Maria Saddique Farooq Ashraf	Hailey College of Banking and Finance, University of the Punjab	Effects of Employer Branding and Religiosity on the organizational Commitment
3	Laraib Fatima	Hailey College of Banking and Finance, University of the Punjab	The Impact of Participative Leadership on Innovative Work Behavior through Different Mediating Mechanisms. Evidence from Banking Sector.
4	Hira Riaz	Hailey College of Banking and Finance, University of the Punjab	Investigating the Impact of Fear Of Missing Out and Impulsive Buying on Post Purchase Disonance
5	Dr. Rizwan Qaiser Danish Ibrar Mansoor Meryum Rehman Eman Fatima	University of Education, Lahore	Factors Affecting Compulsive Buying Behavior through Panic Behavior Disorder in the Pakistani Market
6	Ayesha Shahid	Hailey College of Banking and Finance, University of the Punjab	Exploring the Link Between Employee Collaboration and Job Performance

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Session: 1 (F) Date 03-12-2024 Time: 2:00 – 3:30 Room No. 07 Session Chair: Dr. Beenish Mughal Management and Marketing Room Coordinator: Mr. Asad Ejaz Sheikh			
SR#	Presenter's Name	Institute	Title of the Paper
1	Noor Arif, Amara Safdar	Hailey College of Banking and Finance, University of the Punjab	Challenges in Effective Utilization of Customer Feedback to Retain Customers in Pakistani Market
2	Dr. Rizwan Qaiser Danish Sadia Iftikhar	Institute of Business Administration, University of The Punjab, Lahore, Pakistan	The Impact of e- HR practices on Employee Retention- A case of Service Industry in Pakistan
3	Dr. Rizwan Qaiser Danish Sitara Kanwal	Institute of Business Administration, University of The Punjab, Lahore, Pakistan	Understanding the influence of Popup Ads on Customer Response in Modern Marketing: Popup ads Role in Shaping Customer-Brand Relationship
4	Rizwan Qaiser Danish Waqas Shakir Rehab Khan Muhammad Arslan Rabia Saadat Ali	Institute of Business Administration, University of The Punjab, Lahore, Pakistan	Perceived Insider Status and Thriving at Work: The Moderated Mediation Role of Employee Engagement
5	Zain Ashfaq		The Moderating Effect of Leader's Humiliation on Job Embeddedness and Employee Retention: A Study of Narcissistic, Paternalistic Leadership's Impact
6	Hafiz Muhammad Ahmad	Hailey College of Banking and Finance, University of the Punjab	Impact of Employee Turnover on a Business

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SESSION 2

Session: 2 (A) Date 03-12-2024 Time: 4:00 – 5:30 Room No. 42 Session Chair: Dr. Muhammad Ramzan, Dr. Muhammad Ashfaq & Dr. Kashif Nadeem (Italy) Banking and Corporate Governance Room Coordinator: Dr. Waqas Baig			
SR#	Presenter's Name	Institute	Title of the Paper
1	Noor Fatima	Hailey College Banking and Finance, University of the Punjab	Impact of Credit Risk on Islamic Banks Profitability in Pakistan with the Mediating Role of Macro Economic Factors
2	Dr. Rizwan Qaiser Danish Muhammad Usman Mubarik	University of Engineering and Technology, Lahore, Pakistan	Risk Management Practices and Prospects of Crop Insurance by Determining Farmer's Willingness to Pay: Evidence from District Narowal Punjab, Pakistan
3	Abdullah Shafiq		The Impact of Electronic Customer Relationship Management (E-CRM) Customer Loyalty: Evidence from the Banking Sector
4	Danyaal Bin Raza	University of Central Punjab, Lahore	Exploring the Antecedents of Skilled Workforce Voluntary Turnover within the Context of Migration Wave in Pakistan
5	Prof. Dr. Muhammad Ashfaq	IU International University of Applied Sciences, Germany	AI And the Future of Employment and Higher Education: Will it Increase or Decrease Inequality?
6	Dr. Muhammad Usman Raza Ali Dr. Samar Rahi	Hailey College of Banking and Finance, University of the Punjab	Corporate Governance, Dividend Payout and Role of Leverage: Evidence from Financial Sector of Pakistan

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Session: 2 (B) Date 03-12-2024 Time: 4:00 – 5:30 Room No. 43 Session Chair: Dr. Sayyid Salman Rizavi & Dr. Muhammad Shahbaz Economics and Finance Room Coordinator: Dr. Muhammad Usman			
SR#	Presenter's Name	Institute	Title of the Paper
1	Dr. Rizwan Qaiser Danish Rabia Yousaf	Institute Of Business Administration, University of The Punjab, Lahore, Pakistan	Assessing the Impact of Financial and Legal Constraints on Firm Growth and Survival: A Meta-Analytical Approach
2	Dr. Rizwan Qaiser Danish Iqra Riaz	Institute Of Business Administration, University of The Punjab, Lahore, Pakistan	Impact of Financial Sustainability on Credit risk with moderating behavior of Financial Technology Innovation
3	Muhammad Talha	Hailey College of Banking and Finance, University of the Punjab	Impact of Climate Change on Financial Performance: Evidence from Pakistan Sugar Industry
4	Muhammad Waqar Aslam	Hailey College of Banking and Finance, University of the Punjab	The Impact of POS-Based Taxation on Retail Business Compliance in Pakistan
5	Muhammad Raza Zafar	Bahahuddin Zakariya University Multan	The Role of Corporate Governance in Mitigating Financial Fraud and Enhancing Fraud Detection
6	Muhammad Raza Zafar	Bahahuddin Zakariya University Multan	The Effectiveness of Audit Committees in Improving Corporate Governance

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Session: 2 (C) Date 03-12-2024 Time: 4:00 – 5:30 Room No. 44 Session Chair: Dr. Usman Yousaf & Dr. Zia-ur-Rehman Rao Management and Marketing Room Coordinator: Ms. Rabia Saleem			
SR#	Presenter's Name	Institute	Title of the Paper
1	Dr. Rizwan Qaiser Danish Aneeza Azam	Institute of Business Administration, University of The Punjab, Lahore, Pakistan.	Impact of Leadership Development Practices on Organizational Performance with the Mediating Role of Affective Commitment
2	Dr. Rizwan Qaiser Danish Ali Noman Ashrif	Institute of Business Administration, University of The Punjab, Lahore, Pakistan.	The Influence of Travel Distance on the Adoption of Online Carpooling: Examining the Moderating Role of Perceived Safety
3	Muhammad Tanveer Ikram	Hailey College Banking and Finance, University of the Punjab	Bridging the Green Gap: Examining Sustainable Consciousness, Values and Influences on Green Consumption Intentions Among Gen Z and Millennials
4	Syed Aarsal Abbas		From Unethical Climate to Unethical Acts: Exploring the Roles of UPOB, Employee Moral Disengagement, Self-Interest, and Institutional Pressure
5	Adeel Muhammad	Hailey College of Banking and Finance, University of the Punjab	Quantifying the Impact of E-HRM Practices on Sustainable Competitive Advantage: The Mediating Role of Sustainable E-HRM Systems and Moderating Effect of Organizational Agility
6	Tehmina Fiaz Qazi Muhammad Sohail Javaid Nayyab zulfiqar Anam Sajid	HCBF, PU HCBF, PU UCP, Lahore	The Role of AI and Skilled Workers for Business Sustainability: Organizational Culture as the Moderator

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Session: 2 (D) Date 03-12-2024 Time: 4:00 – 5:30 Room No. 45 Session Chair: Dr. Omer Iqbal & Dr. Bushra Usman Marketing and Management Room Coordinator: Ms. Fareeha Waseem			
SR#	Presenter's Name	Institute	Title of the Paper
1	Adia Tallat	Hailey College of Banking and Finance, University of the Punjab	Impulsive Buying in the Digital Age: Omnichannel Usage and Payment Method Preferences
2	Zain Ashfaq		Evaluating the Effect of Toxic Leadership on Workplace Bullying in the Different Sector of Gujranwala: Mediated-Moderated Model of Employee Silence, Psychological Wellbeing and Employee Voice
3	Naeem Abbas	Bahria University, Lahore	Enhancing Project Success through Effective Communication: The Moderating Role of ICT in Government Projects
4	Abdul Mateen Yousaf	COMSATS University Islamabad Lahore Campus	Mindfulness to Enhance Employee Performance in High-Stress Environments: An evidence from IT Sector of Pakistan
5	M.Waqar Aslam	Hailey College of Banking and Finance, University of the Punjab	Leadership Impact On Organizational Performance In Pakistan's Textile Industry

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Session: 2 (E) Date 03-12-2024 Time: 4:00 – 5:30 Room No. 06 Session Chair: Dr. Syed Muhammad Irfan & Mr. Umar Sharif (FCC) Sustainability and Management Room Coordinator: Ms. Anam Masood			
SR#	Presenter's Name	Institute	Title of the Paper
1	Arjumand zaidi	Hailey College of Banking and Finance, University of the Punjab	Challenges of Implementing Green Human Resource Practices in Pakistan
2	Adil Arshad	Hailey College of Banking and Finance, University of the Punjab	Low Agricultural Yield of Major Cash Crops of Pakistan and its Impacts
3	Saba Shahzadi	Hailey College of Banking and Finance, University of the Punjab	Factors Affecting Tourism, Tourism Potential and Strategies for Development as an Industry in Pakistan
4	Rida Fatima	Hailey College of Banking and Finance, University of the Punjab	The Impact of Green Investment and Green Marketing on Financial Performance: A Test of the Mediating Model
5	Dr. Kashif Nadeem Waheed Akram	Institute of Business Administration, University of The Punjab, Lahore, Pakistan.	Digitalization and Sustainability: An Integrative Literature Review through Taxonomy Development
6	Muhammad Rohan Bashir		Sustainable Development vs. Political Influence: Corporate Environmental Practices in Pakistan

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Session: 2 (F) Date 03-12-2024 Time: 4:00 – 5:30 Room No. 07 Session Chair: Dr Amer Shakeel & Dr. Naveed ul Hassan CSR and Finance Room Coordinator: Mr. Asad Ejaz Sheikh			
SR#	Presenter's Name	Institute	Title of the Paper
1	Rafay Ahmad	University of Management and Technology, Lahore	The Role of CSR Spending in Enhancing Firm Performance: Insights from the Pakistan Stock Exchange
2	Amna Murtaza	University of Management and Technology, Lahore	Examining the Characteristics of Audit Committee on Firm Performance with Ownership Concentration as a Moderator
3	Esha Nisar	University of Management and Technology, Lahore	From Foundation to Innovation: Predicting the Impact of CEO Attributes on firm Innovation
4	Dr. Muhammad Usman Zeeshan Iqbal Dr. Samar Rahi	Hailey College of Banking and Finance, University of the Punjab	Firm Performance and Donation Payout as Predictor of Share Value through Moderating Effect of Corporate Philanthropy
5	Hafiz Mohsin Ali	Hailey College of Banking and Finance, University of the Punjab	Impact of Entrepreneurial Knowledge and FinTech on the Entrepreneurial Intension
6	Bisma Shehzadi		Factors Influencing Consumer trust in e-commerce

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SESSION 3

Session: 3 (A) Date 04-12-2024 Time: 9:00 – 10:30 Room No. 42 Session Chair: Dr. Bilal Ahmed & Dr. Muhammad Usman Management and Digitalization Room Coordinator: Dr. Waqas Baig			
SR#	Presenter's Name	Institute	Title of the Paper
1	Hammad Ahmad Warsi		Blockchain Innovation in Agriculture Sector of Pakistan: Prospects and Challenges of Adoption
2	Ayesha Noor		A Proposed Model for Solar Photovoltaic System Installation: Overview of Asian Countries
3	Dr. Muhammad Rizwan Yaseen	Government College University Faisalabad	The Impact of digital Marketing and Freelancing on Household Welfare in Pakistan
4	Muhammad Abdullah Hassan	Hailey College Banking and Finance, University of the Punjab	The Impact of Artificial Intelligence on Sustainable Growth: The Mediating Role of Digital Transformation
5	Riffat Sabir	Hailey College Banking and Finance, University of the Punjab	Impact of BDA and AI Capabilities on The Firm Performance with Mediating Role of Data-Driven-Culture

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Session: 3 (B) Date 04-12-2024 Time: 9:00 – 10:30 Room No. 43 Session Chair: Dr. Fatima Shaukat & Dr. Abdul Aziz Khan Niazi Marketing and Management Room Coordinator: Dr. Muhammad Usman			
SR#	Presenter's Name	Institute	Title of the Paper
1	Muhammad Shan	Hailey College of Banking and Finance, University of the Punjab	Immersive Retailing: Exploring the Impact of Virtual Reality on Customer Experience and Brand Loyalty
2	Abdullah Hamid	Hailey College of Banking and Finance, University of the Punjab	Impact of Social Media and Smartphone Usage on the Students (How it Affects Students' Behavior in Academic Performance)
3	Hafiza Syeda Soha Sharafat Muhammad Sohail Javaid	Hailey College of Banking and Finance, University of the Punjab	The Impact of Artificial Intelligence on Business Performance: Examining the Role of Artificial Intelligence on Business Performance, Mediating Role of Organizational Resilience and Moderating Role of Big Data Analytics
4	Eman Pervaiz Muhammad Usman	Hailey College of Banking and Finance, University of the Punjab	Understanding the Influence of Customer Psychology on Buying Decisions
5	Sabahat Rizwan	Institute of Administrative Sciences, University of the Punjab	Global Warming & Climate change” An Exploration of the Perceptions and Facts of Global Warming and it's Caused Consequences on the Atmosphere and Natural Habitats

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Session: 3 (C) Date 04-12-2024 Time: 9:00 – 10:30 Room No. 44 Session Chair: Mr. Muhammad Idrees & Dr. Farah Naz Sustainability and Digitalization Room Coordinator: Ms. Rabia Saleem			
SR#	Presenter's Name	Institute	Title of the Paper
1	Afra Zafar	Hailey College Banking and Finance, University of the Punjab	Influencing Green Agenda: Factors Affecting Green Purchase Intentions of Gen Z
2	Muhammad Baqar Naqvi	Hailey College Banking and Finance, University of the Punjab	Empowering Entrepreneurial Intentions Through Digital Readiness and E-Learning
3	Amna Amin	Hailey College Banking and Finance, University of the Punjab	Financial Determinants of Corporate Failure: Empirical Evidence from Pakistan
4	Aimon Riaz	Rashid Latif Khan University	Effect of Green Logistics on Economic Development at Global Level
5	Sidra Saleem	Rashid Latif Khan University	CSR and Employee Pro-Social and Environmental Behaviors: The Role of Intentions, Climate and Green HRM

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Session: 3 (D) Date 04-12-2024 Time: 9:00 – 10:30 Room No. 45 Session Chair: Mr. Asad Ejaz Sheikh Management and Sustainability Room Coordinator: Ms. Fareeha Waseem			
SR#	Presenter's Name	Institute	Title of the Paper
1	Lubna Khalid	Hailey College of Banking and Finance, University of the Punjab	Green Consumerism, Green Perceived Value and Revisit Intention: Insights from Pakistan's Restaurant Industry
2	Sehar Iqbal		Relationship of Transformational leadership and Work Outcomes (Performance & Satisfaction and OCB): The Role of Identification, Engagement and Personality Traits
3	Rabiya Usman	Kinnaird College for Women University	The Impact of Decarbonization, Green Finance and Innovation on Ecological Footprints: Moderating Role of Technological Innovations and Influence of Economic factors
4	Nayyab Zulifqar	University of central Punjab, Lahore	Use of Artificial Intelligence in the Banking Industry (Case study of Pakistan)
5	Anusha Khan Fizza Rizvi	Hailey College of Banking and Finance, University of the Punjab	Effects of Social Media Usage on Reading Habits amongst the Students of University of the Punjab

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Session: 3 (E) Date 04-12-2024 Time: 9:00 – 10:30 Room No. 06 Session Chair: Ms. Fareeha Waseem Total Quality Management and Sustainability Room Coordinator: Ms. Anam Masood			
SR#	Presenter's Name	Institute	Title of the Paper
1	Ahmed Ayyaz	Hailey College of Banking and Finance, University of the Punjab	Adoption of Solar Energy Benefits and Drawbacks in 2024: The Role of Technological Advancement and Mediating Challenges
2	Syed Dabeer ur Rehman	Bahria University Lahore	Impact of Inventory Management on Organizational Competitiveness: The Mediating Role of Agility in Inventory Management and the Moderating Effect of Employee Training and Development in Pakistan's IT Sector.
3	Aiman Nisar	Hailey College of Banking and Finance, University of the Punjab	Empirically Analyzed the Effect of Total Quality Management on Organizational Performance: With Mediation of Sustainable Innovation along with the Moderating Impact of Artificial Intelligence (AI) Adoption in Project
4	Areej Shoukat	Hailey College of Banking and Finance, University of the Punjab	Exploring the Impact of Storytelling Involvement in Hospitality Marketing: Mediating Roles of Perceived Authenticity, Well-Being and Customer Engagement on Consumer Behavior, Revisit Intentions and Purchase Decisions
5	Sayed Mehara Hasan	Hailey College of Banking and Finance, University of the Punjab	Scaling Circular Business Model: The Role of Anthropomorphism in Second Hand Fashion Retail

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Session: 3 (F) Date 04-12-2024 Time: 9:00 – 10:30 Room No. 07 Session Chair: Mrs. Tahreem Sadiq & Dr. Nisar Organizational Behavior and Management Room Coordinator: Mr. Asad Ejaz Sheikh			
SR#	Presenter's Name	Institute	Title of the Paper
1	Ayesha Noor Aslam	Hailey College of Banking and Finance, University of the Punjab	Investigating the Impact of Attitude Homophily with Influencers on E-entrepreneurial Intentions among Digital-native Generations
2	Muhammad Tasnim Khan	University of Management and Technology, Lahore	Navigating Contradictions: Exploring the Impact of Paradoxical Leadership on Employee Innovative Performance through Job Crafting and Job Autonomy
3	Saadia Younis	Hailey College of Banking and Finance, University of the Punjab	Financial Determinants of Dividend Smoothing: An Empirical Evidence from Pakistan
4	Shery Irshad		Organization Culture, Stakeholders Engagement
5	Usaid Ahmed Nadeem	Hailey College of Banking and Finance, University of the Punjab	Remote Work Dynamics: Impact on Productivity and Employee Satisfaction

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SESSION 4

Session: 4 (A) Date 04-12-2024 Time: 11:00 – 12:30 Room No. 42 Session Chair: Dr. Muhammad Gulzar & Dr. Fahmeed Idrees Governance and Management Room Coordinator: Dr. Waqas Baig			
SR#	Presenter's Name	Institute	Title of the Paper
1	Alishba Jameel	University of Management and Technology, Lahore	Strategic Governance: How Corporate Oversight Drives Social Responsibility Initiatives
2	Dua Batool Khan	University of Management and Technology, Lahore	Board Characteristics and Audit Quality with The Moderating Role of Gender Diversity
3	Laibah Hassan	University of Management and Technology, Lahore	Assessing How Audit Committee Features Affect the Integrity of Financial Reporting
4	Minahil Fayyaz	University of Management and Technology, Lahore	Analyzing the Influence of Working Capital Management on the Financial Performance of Selected Chemical and Pharmaceutical Firms in Pakistan
5	Kanwal safdar	Hailey College of Banking and Finance, University of the Punjab	ESG Unveiled: Enhancing Financial Performance in Investment Portfolios
6	Saeeda Batool	Hailey College of Banking and Finance, University of the Punjab	Role of Transformational Leadership on Work Engagement through Employee Empowerment in Banking

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Session: 4 (B) Date 04-12-2024 Time: 11:00 – 12:30 Room No. 43 Session Chair: Dr Burhan Rasheed & Dr. Muhammad Adnan Sial Governance and Management Room Coordinator: Dr. Muhammad Usman			
SR#	Presenter's Name	Institute	Title of the Paper
1	Nimra Dildar	University of Management and Technology, Lahore	The Impact of Family ownership on Dividend policy and Board Independence in Moderating Role of CEO compensation
2	Rameen Sibghat	University of Management and Technology, Lahore	The Influence of Independent Boards on the Relationship between Audit Quality and Earnings Management
3	Umair Ali	University of Management and Technology, Lahore	The Influence of Attributes of Corporate Governance on Financial Reporting Quality: Evidence from Pakistan
4	Muhammad Saad	Hailey College of Banking and Finance, University of the Punjab	Remote Work and Employee Outcomes: A Study of Productivity and Engagement
5	Aqsa Zaheer	Hailey College of Banking and Finance, University of the Punjab	The Impact of Organizational Learning and Strategic Alignment on the Operation Efficiency, Employee's Productivity and Management Performance
6	Maryam Maqsood		Aspects Affecting Consumer Behaviour: A Comprehensive Analysis

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Session: 4 (C) Date 04-12-2024 Time: 11:00 – 12:30 Room No. 44 Session Chair: Dr. Ijaz Hussain Bukhari & Dr. Naveed (GRW) CSR and Governance Room Coordinator: Ms. Rabia Saleem			
SR#	Presenter's Name	Institute	Title of the Paper
1	Muhammad Islam	University of Management and Technology, Lahore	A Study of Relationship between Growth of Islamic Banks and Conventional Banks in Pakistan with Mediating Effect of Bank Size
2	Fatima Jamal	University of Management and Technology, Lahore	Ownership Diversity and Business Success: Examining Governance Strategies' Influence
3	Neha Hussain	University of Management and Technology, Lahore	Assessing the Strategic Impact of CSR Initiatives on Corporate Profitability
4	Asad Anjum Mirza	University of Management and Technology, Lahore	Examining the Influence of Audit Committee Characteristics on CSR Disclosure: The Moderating Effect of Audit Quality
5	Esha Butt	Hailey College of Banking and Finance, University of the Punjab	Green Human Resource Management and Sustainable Performance with the Mediating Role of Green Innovation: A Perspective of New Technological Era
6	Muhammad Talha Zahid	Hailey College of Banking and Finance, University of the Punjab	From Protest to Practice” The Economic Ramifications of a Muslim World Boycott on Israeli Products

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Session: 4 (D) Date 04-12-2024 Time: 11:00 – 12:30 Room No. 45 Session Chair: Dr. Unbreen Arif & Dr. Fouzia Ali Hadi Marketing and Change Management Room Coordinator: Ms. Fareeha Waseem			
SR#	Presenter's Name	Institute	Title of the Paper
1	Dr. Unbreen Arif	University of Education, Lahore	Volatility Dynamics of Shariah-Compliant and Non-Shariah-Compliant Equity Portfolios: A Case of Emerging Economy
2	Fazila Rubab	Hailey College of Banking and Finance, University of the Punjab	Cybersecurity Awareness and its Impact on Employees Behavior
3	M. Farakh Farooq	Hailey College of Banking and Finance, University of the Punjab	The Impact of Remote Work on Employee Productivity and Job Satisfaction in COVID-19
4	Isha Khalid	Hailey College of Banking and Finance, University of the Punjab	Global-Local Consumer Identities and their Influence on Global Digital Brand Engagement
5	Faseeh Sheikh	Hailey College of Banking and Finance, University of the Punjab	The Impact of Brand Ownership on Customer Engagement Behavior: The Mediating Role of Customer Brand Identification and the Moderating Influence of Cultural Values Orientation

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Session: 4 (E) Date 04-12-2024 Time: 11:00 – 12:30 Room No. 06 Session Chair: Mrs. Rabia Saleem & Dr. Sehar Latif Management and Governance Room Coordinator: Ms. Anam Masood			
SR#	Presenter's Name	Institute	Title of the Paper
1	Hafiz Hamza		The Legal Obligation of Promises in Islamic Banking: A Jurisprudential Perspective and Modern Applications
2	Dr. Abdul Hafeez	Bahria University, Lahore Campus)	Enhancing Usability of Mobile Banking in Pakistan for Leveraging Financial Inclusion and Social Impact
3	Dania Asghar	Hailey College of Banking and Finance, University of the Punjab	Impact of Social Media Marketing on Customer Behavior
4	Amna Eman	Hailey College of Banking and Finance, University of the Punjab	Employee Performance
5	Dr. Farah Naz Myra Nadeem	Kinnaird College for Women Lahore, Pakistan	Global Drivers For ESG: Evidence from China

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Session: 4 (F) Date 04-12-2024 Time: 11:00 – 12:30 Room No. 07 Session Chair: Mrs. Sadia Ahmed Governance and Management Room Coordinator: Mr. Asad Ejaz Sheikh			
SR#	Presenter's Name	Institute	Title of the Paper
1	Khushi Shabbir	Kinnaird College for Women Lahore	Determinants Influencing the Profitability of Conventional and Islamic Banks. Using a Fuzzy-Set of Qualitative Comparative Analysis (fsQCA)
2	Dr. Muhmmad Usman Kaneez Batool Dr. Samar Rahi	Hailey College of Banking and Finance, University of the Punjab	Annexes of CO2 Emission with Economic Growth and Corruption in SAARC Countries
3	Kinza Mehmood	Hailey College of Banking and Finance, University of the Punjab	Impact of Organization Culture on Employer, Employee Relationship & Employee Efficiency
4	Nadia Shafiq	Hailey College of Banking and Finance, University of the Punjab	The Impact of Organizational Learning and Strategic Alignment on the Operation Efficiency, Employee's Productivity and Management Performance
5	Maidah Tahir Butt	Hailey College of Banking and Finance, University of the Punjab	An Exploratory Study of Intersection of FinTech, AI(Artificial Intelligence) and Green Finance: A Cooperative Approach

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SESSION 5

Session: 5 (A) Date 04-12-2024 Time: 2:30 – 4:00 Room No. 42 Session Chair: Mrs. Anam Masood Human Resource Management and Marketing Room Coordinator: Dr. Waqas Baig			
SR#	Presenter's Name	Institute	Title of the Paper
1	Noor Bukhat	Hailey College of Banking and Finance, University of the Punjab	How HRM Practices Improve the Organizational Performance
2	Nousher Chohan	Hailey College of Banking and Finance, University of the Punjab	The Impact of Social Media Usage on Mental Health Outcomes in Young People
3	Zunaira Azmat Aleena Asif	Hailey College of Banking and Finance, University of the Punjab	The Effect of Positive and Negative Feedback on Self- Efficacy, Cognitive Trust and Affective Trust
4	Anam Basharat	Hailey College of Banking and Finance, University of the Punjab	Scaling Circular Business Model: The Role of Anthropomorphism in Second Hand Fashion Retail
5	Abdul Aziz Khan Niazi Tehmina Fiaz Qazi Suleman Sami Qazi	UET, Lahore, Pakistan HCBF, PU, Lahore UET, Lahore, Pakistan	Examining the Frequency Movements of Government Domestic Debts

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Session: 5 (B) Date 04-12-2024 Time: 2:30 – 4:00 Room No. 43 Session Chair: Dr. Waqas Baig & Ms. Rida Akbar Marketing and Management Room Coordinator: Dr. Muhammad Usman			
SR#	Presenter's Name	Institute	Title of the Paper
1	Maliha Anam	Hailey College of Banking and Finance, University of the Punjab	Exploring the Role of Training & Development in Enhancing Employee Retention
2	Sadeeqa Batool	Hailey College of Banking and Finance, University of the Punjab	The Impact of Human Resource Management (HRM) on Employee Satisfaction and Performance
3	Abdul Rauf	Hailey College of Banking and Finance, University of the Punjab	E-Commerce growth and challenges in 2024: The Role of Technological Advancement and Mediating Challenges
4	Ambreen		The effectiveness of Influencer Marketing in Promoting Brands
5	Kainat Arif	Hailey College of Banking and Finance, University of the Punjab	How dose Ramdan affect Small Businesses in Pakistan
6	Tehmina Fiaz Qazi Abdul Aziz Khan Niazi Suleman Sami Qazi	HCBF, PU, Lahore, Pakistan UET, Lahore, Pakistan UET, Lahore, Pakistan	Evaluating Ups and Downs of National Savings of Pakistan by Transform Analysis

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Session: 5 (C) Date 04-12-2024 Time: 2:30 – 4:00 Room No. 44 Session Chair: Dr. Farah Naz Naqvi & Dr. Nousheen Supply Chain Management and HRM Room Coordinator: Ms. Rabia Saleem			
SR#	Presenter's Name	Institute	Title of the Paper
1	Shezil Shahid	Information Technology University, Lahore	The Impact of Lean Manufacturing on Supply Chain Performance in the Pakistani Textile Industry
2	Sehrish Fraz	Information Technology University, Lahore	Financial Literacy, Risk Appetite and Stock Market Investments; Intellectual Investment or Actual Investment
3	Hijab Zahra	Hailey College of Banking and Finance, University of the Punjab	Role Of HRM in Enhancing the Organization Growth
4	Zairah Jaffri	University of Central Punjab, Lahore, University of the Punjab	Case Study Project Management Challenges in Health Sector of Pakistan (PMU)
5	Amna Basit	Hailey College of Banking and Finance, University of the Punjab	An Analysis of the Impact of Globalization on the Business Operations
6	Tehmina Fiaz Qazi Abdul Aziz Khan Niazi Suleman Sami Qazi	HCBF, PU, Lahore, Pakistan UET, Lahore, Pakistan UET, Lahore, Pakistan	An Insight into Foreign Exchange Rates of currencies traded in Pakistan

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Session: 5 (D) Date 04-12-2024 Time: 2:30 – 4:00 Room No. 45 Session Chair: Dr. Zargham Ullah Khan & Dr. Tehmina Fiaz Qazi AI integration and Management Room Coordinator: Ms. Fareeha Waseem			
SR#	Presenter's Name	Institute	Title of the Paper
1	Hamza Yousaf		AI Tools and their Impact on the Growth of Modern Business Development
2	Muhammad Ubaid	Information Technology University, Lahore	Unlocking Business Potential through Digital Transformation: Leveraging AI and Design for Enhanced Performance
3	Azan Ahmad	Information Technology University, Lahore	The Impact of Data Analytics on Business Decision-Making: A Study of Data-Driven Strategies
4	Nadia Saeed	Institute of Administrative Sciences, University of the Punjab	Technology and Innovation, Adoption of AI and its Impact on Customer Service in the Retail Sector
5	Hira Zubair	Hailey College of Banking and Finance, University of the Punjab	Building a Strong Employer Brand in Educational Institutions: Impact on Organizational Performance and Employee Engagement

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Session: 5 (E) Date 04-12-2024 Time: 2:30 – 4:00 Room No. 06 Session Chair: Dr. Farhan Sarwar Management and Governance Room Coordinator: Ms. Anam Masood			
SR#	Presenter's Name	Institute	Title of the Paper
1	Khansa Butt	Information Technology University, Lahore	Digital Marketing through the Lens of Personalized Marketing, Influencer Marketing and User-Generated Content
2	Rimal Khan Dr. Muhammad Adnan Sial	Information Technology University, Lahore University of Education, Lahore	The Impact of AI on Organizational Decision-Making
3	Sammar Saddique	Information Technology University, Lahore	The Impact of Social Media on Consumer Purchase Intentions
4	Asma Rafique Chughtai	Virtual University of Pakistan	Constituting Financial Inclusion Index and Assessing its Impact on Economic Growth of Pakistan
5	Mubeen Amjad	Hailey College Banking and Finance, University of the Punjab	Role of Transformational Leadership on Innovative Work: Evidence from service sector of Pakistan
6	Tehmina Fiaz Qazi Abdul Aziz Khan Niazi Suleman Sami Qazi	HCBF, PU, Lahore, Pakistan UET, Lahore, Pakistan UET, Lahore, Pakistan	Reconnoitering the Tax Revenues of Pakistan through Wavelet Analysis

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Session: 5 (F) Date 04-12-2024 Time: 2:30 – 4:00 Room No. 07 Session Chair: Dr. Hassan Danish & Dr. Waqas Farooq Finance and Governance Room Coordinator: Mr. Asad Ejaz Sheikh			
SR#	Presenter's Name	Institute	Title of the Paper
1	Dr. Muhammad Usman Yusra Malik Dr. Samar Rahi	Hailey College of Banking and Finance, University of the Punjab	Impact of Financial Literacy Gender Preferences on Stock Market Participation with reference to Risk Attitude
2	Syed Zain Ul Abedeen	Hailey College of Banking and Finance, University of the Punjab	Impact of Fintech Innovations on Traditional Banking Performance
3	Umair Ilyas	University of Management and Technology, Lahore	Examining the Impact of Working Capital Management on Firm Value, Mediated by Institutional Ownership
4	Zara Aslam	University of Management and Technology, Lahore	Exploring the Strategic Role of Corporate Social Responsibility in Enhancing Firm Performance: Evidence from Pakistan
5	Javeed Iqbal	University of Management and Technology, Lahore	Green Banking Activities and Environmental Performance of the Banks in Pakistan: The Moderating Effect of Green Finance
6	Abdul Aziz Khan Niazi Tehmina Fiaz Qazi Suleman Sami Qazi	UET, Lahore, Pakistan HCBF, PU, Lahore UET, Lahore, Pakistan	Investigating the Weighted Average Lending Rate in Pakistan: A perspective from Three Decades

Abstracts

Constituting Financial Inclusion Index and Assessing its Impact on Economic Growth of Pakistan

Asma Rafique Chughtai

Department of Management Sciences, Virtual University of Pakistan

Sheikh Umar Saeed

WAPDA

Abstract

The provision of useful financial products and services to the masses of an economy and their contribution to their living standards as well as to the economy at large cannot be accessed in the absence of a formulized mechanism. This is where the need for constructing a financial inclusion index arises. This study aimed at constructing Financial Inclusion Index (FII) for Pakistan. Further, the resulting index impact on economic development has been assessed. For FII index construction, data has been collected from the three main dimensions of financial inclusion, namely Access, Usage and Quality. Proxies from each of these parameters have been considered. Data has been collected for a period of 11 years (2012-2022) using the World Bank data pool, Global Findex Portal and IMF digital database to ensure authenticity and reliability. FII is constructed through Principal Component Analysis. Values of FII indicate that it gradually moved from the low financial inclusion index (2012) to the medium FII zone (2016) and eventually to the high FII zone (2017-2022). This is an indication that Pakistan is now paying due attention in utilizing its resources that contributes to the outreach of financial products and services to the masses. Further, results of regression analysis reveal a statistically significant positive impact of FII on GDP growth rate. Suggesting that policy makers should ponder upon formulating and implementing strategies that assure provision of financial products and services to the poor masses.

Keywords: Financial Inclusion Index, Two Stage Principal Component Analysis, World Bank, Global Findex, IMF Database, Digital Financial Inclusion, GDP Growth Rate

Blockchain Innovation in Agriculture Sector of Pakistan: Prospects and Challenges of Adoption

Hammad Ahmad Warsi
Naveed Iqbal Chaudhry
Aiman Tahir Hashmi

Abstract

Blockchain is one of the most crucial and powerful technology which is revolutionizing industries worldwide. It is a decentralized ledger technology used to record transactions across many computers. The transactions done are immutable in nature which means that the recorded information on the ledgers cannot be changed easily. The concept of decentralization is important as, if anyone wants to change the information for their gains, they cannot do it individually and as a sole central authority. Blockchain is revolutionizing a lot of industries through its decentralized and immutable systems. Agriculture is one of them. The biggest beneficiary from the integration of blockchain technology in agriculture will be the farmer community. Through its peer-to-peer transaction method, the blockchain technology will assist the farmers by liberating them from the ruthless chains of intermediaries. In developing societies, it is the intermediary who benefits the most in the agriculture industry. By decreasing the numbers of intermediaries in the industry, the farmers will get most of the profit from their crops. The agriculture sector of Pakistan contributes 24 percent to the total Gross Domestic Product (GDP) and 37% of employment generation of the country. The country is also amongst the world's top ten producers of wheat, cotton, sugarcane, mango, dates and kinnow oranges, and is ranked 10th in rice production. The adoption of blockchain technology by the agriculture sector can help in the betterment of the industry and can help in promoting more transparency and trust amongst farmers and consumers. The following paper aims at studying the prospects and challenges of adoption of blockchain technology in agriculture and how can it ultimately help in economic growth. While the technology can create transparency, food traceability, more profits to farmers, there can be challenges such as slow internet, low level of literacy and laggardly behavior of farmers. The data collection methods were primarily conducting interviews of blockchain experts and the secondary means were reviews of case studies regarding blockchain in agriculture sector in developing countries.

Keywords: Blockchain, Agriculture, Pakistan, Decentralization, Farmers.

Factors Affecting the Green Investment and Assessing its Effectiveness for Economic, Social, and Environmental Performance of Firms

Hafsa Mehmood

Department of Accounting & Finance, Kinnaird College for Women, Lahore

Dr. Farah Naz

Department of Accounting & Finance, Kinnaird College for Women, Lahore

Abstract

This paper seeks to analyze the various stages of green investment decision making by the Chinese firms and determine the effects that it has on the economic, social and environmental sustainability. The data collected from 418 responses employing structured questionnaire survey in China is analyzed in the research with the help of Cronbach's alpha, Fornell-Larcker, AVE, Composite Reliability for the evaluation of inter-relationship of various variables. Contrary to expectations, the empirical evidence shows that these factors are statistically insignificant, so questioning other factors that might define green investments. This is why there is a need to approach the study of green investment dynamics with a finer lens when it comes to Chinese enterprises. In contrast to the optimistic findings of the conventional academic and policy research, a different picture of green investments emerges based on the empirical data. This emphasizes the need for context embedded solutions and more studies to understand challenges relating to green investment decision making. It is thus suggestion that this study is informative and has policy implications particularly for policy makers and firms that are finding it hard to develop sustainable business models. As the green investment is low, the policy makers might have to revisit the efficiency of the policy instruments currently in use to influence green investment such as taxes and grants. Managers also require to shift their mentality towards understanding of when and how the adoption of green investments can be incorporated into the firm strategies, based on the conclusions made in the empirical analysis part of the research. Besides this, efforts should be made to ensure that there are adequate linkages for firms and the general public to access environmental information and factors that may be of concern, and this may need some training and information dissemination.

A pathway of Employee's Positive Energy towards Subjective Well-Being by Grit and Flourishing as Mediation Variables

Muhammad Adnan Riaz

Hailey College of Banking and Finance, PU

Muhammad Sohail Javaid

Hailey College of Banking and Finance, PU

Abstract

This paper analyzes the impact of grit, flourishing and staff energy over the subjective well-being. Its primary goal is to investigate the impact of employees' roles in the business sector. It explains that how business tackles employees' encouragement as well as low energy believes issues in the market. The researcher provides insight into how employees manage the company system and how various risk elements, such as liquidity risk, expert management risk, and quit risk, impact business performance. This study discusses the benefits and drawbacks of moral leadership in the workplace as well as the kinds of successful workers that are best for companies. The study describes how specific business laws establish the upper bound on positive energy for employee empowerment. The research design used for this study is correlational, non-experimental, and quantitative. The researcher gathered data from the target respondents in their normal, unaffected working environments, thus the study settings won't be prefabricated. We used the multistage sampling technique for sample selection. This study focuses on the effects of flourishing and grit movements on workers' performance in terms of their subjective well-being. The conclusions of the study are how employees behave after involving grit as a mediation variable to produce a favorable response in output, where varied numbers of proposed variables are explored as performance indicators. This document supports the company's strategic and resilient standing during a period of strict business policy. This document also provides assistance in both scenarios with the actions that the firm can take to manage future well-being issues, such as customer satisfaction, investments, timely performances and numerous other issues linked to corporate performance. The study comes to the conclusion that employees' energy fluctuation through various mediations affects business intermediary work, which in turn has a significant long-term impact on performance.

Keywords: Grit, Subjective Well-being, Flourishing, Mediation, Variable, Intermediary work, Business policy, Positive energy

Global Drivers For ESG: Evidence from China

Myra Nadeem

Kinnaird College for Women Lahore, Pakistan

Dr. Farah Naz

Kinnaird College for Women Lahore, Pakistan

Abstract

The aim of the study is to understand how CEO duality, board independence, female on board, executive member gender diversity, gender equality and state owned enterprise relate to ESG score being critical for green growth and sustainable business practices. The paper investigates a sample of 665 China listed companies. The study utilized six-year panel dataset from year 2018 to 2023. China Stock Market & Accounting Research (CSMAR) database were evaluated using quantitative methods that included linear regression analysis to examine large datasets using SPSS software. The findings of the study deliver new suggestions on the different noteworthy roles including CEO duality, board independence, female on board, executive member gender diversity and gender equality being significant in initiatives related to enlightening performance of ESG measures in the context of China while state owned enterprise is the only variable that has an insignificant relationship with ESG performance. The practical implications of this research are crucial and essential. Society often looks for the remedies to the ESG issues. Management of the companies are under great pressure to deliver improvements related to ESG. This study adds to the body of knowledge regarding ESG performance. Understanding importance of these major drivers can be very beneficial for the management and investors to take steps regarding positive ESG change. CEO duality, gender diversity and board independence are progressively significant topics in China. The institutional investors are playing significant role in causing impact on the ESG investment practices and putting a challenge for the companies regarding their ESG performance and endorsing the ESG performance within their range. Given the limited knowledge of how to best manage companies to efficiently achieve positive ESG outcomes and sustainable business practices, we explore the major drivers of ESG performance.

Keywords: ESG, CEO duality, gender diversity, board independence, female on board, executive member gender diversity, linear regression, SPSS

A Proposed Model for Solar Photovoltaic System Installation: Overview of Asian Countries

Abstract

Pakistan, a country grappling with severe energy shortages, presents a compelling case for the adoption of renewable energy sources, particularly solar photovoltaic (PV) technology. However, the high upfront costs of solar PV systems often hinder their widespread deployment. To address this challenge, a comprehensive understanding of various financing models is essential. This research delves into the intricacies of solar PV financing in Pakistan, examining the potential of traditional financing methods such as bank loans and leasing, as well as innovative approaches like power purchase agreements (PPAs) and Shariah-compliant financing. It analyzes the factors influencing the choice of financing models, including project size, financial capacity, and regulatory environment. Furthermore, the study explores the role of government policies and incentives in promoting solar PV adoption. The impact of subsidies, tax breaks, and net metering policies on the financial viability of solar projects is assessed. Additionally, the paper examines the role of international financing institutions in supporting solar energy initiatives in Pakistan. To enhance the efficiency and environmental sustainability of solar PV systems, emerging technologies such as floating solar PV, bifacial solar cells, and solar trees are discussed. These innovations offer potential solutions to land constraints and optimize energy generation. By providing a comprehensive overview of solar PV financing options and technological advancements, this research aims to contribute to the development of sustainable energy policies and accelerate the transition to a low-carbon future in Pakistan.

The Impact of digital Marketing and Freelancing on Household Welfare in Pakistan

Muhammad Awais

Department of Economics, Government College University Faisalabad

Muhammad Sohail Amjad Makhdom

Department of Economics, Government College University Faisalabad

Muhammad Rizwan Yaseen

Department of Economics, Government College University Faisalabad

Abstract

This study examines the impact of digital marketing and freelancing on household welfare in Pakistan, including factors such as income, expenses, living conditions, education, and work-life balance. The primary data was collected through a personal interview questionnaire and an online Google form, surveying a total of 200 online workers. The results demonstrate the significant positive influence that digital marketing and freelancing have on various aspects of household welfare like income, housing, saving, quality of life, work-life balance, and household well-being. The OLS results reveal several key determinants of household welfare in online businesses. Household size, years of experience in digital work, and monthly income from digital activities are all positively related to household welfare. The type of device used also plays a role, with laptops showing above-average welfare gains compared to desktops or mobile phones. These findings highlight the importance of digital skills, appropriate hardware, and supporting software for maximizing the benefits of the digital economy. While the study identifies numerous positive impacts, it also uncovers some unexpected relationships. For instance, education and household welfare, while not statistically significant, appear to have a negative correlation. The analysis also suggests that urban households may experience slightly lower welfare gains from digital work compared to rural households, though this result is not statistically significant. This research contributes important quantitative evidence on the socio-economic benefits of the digital economy. The findings hold significant policy implications, including the need for targeted digital skills program initiatives and an enabling environment to ensure more equitable access to the opportunities of online work across different demographic groups and geographies.

Keywords: Digital Marketing, Freelancing, Primary Data, OLS, Household welfare,

Perception & Acceptance of Islamic Banking Products and Services: Analyzing Consumer Awareness & Adoption

Mahnoor Asif

Hailey College Banking and Finance, Punjab University, Lahore

Dr. Waqas Baig

Hailey College Banking and Finance, Punjab University, Lahore

Abstract

This study examines the key factors that impact consumer acceptance of Islamic banking products and services. Based on Shariah principles, Islamic banking emphasizes ethical finance by forbidding interest, speculative trading, and investments in restricted industries. Although this sector has grown significantly, consumer adoption remains limited due to low awareness and common misconceptions. This research investigates how factors like consumer awareness, perceived benefits, bank reputation, and religious motivation interact to influence acceptance of Islamic banking services. Through a quantitative approach, data was gathered from 500 survey participants with diverse backgrounds who have bank accounts. The study analysed how awareness affects adoption, the importance of perceived financial and ethical benefits, the impact of bank reputation in building trust, and how religious motivation moderates these factors. The collected data will be analysed by using descriptive statistics, correlations, and regression tests to evaluate the relationships between these factors. The findings suggest that while religious beliefs are important, perceived financial and ethical benefits also play a major role in attracting consumers to Islamic banking. However, issues like limited awareness and misunderstandings still hindering wider acceptance. Based on these findings, this study provides recommendations for Islamic banks to improve consumer education, clarify misconceptions, and enhance their products and services to better match consumer needs. This research contributes valuable insights into Islamic finance, offering practical guidance for expanding customer engagement and loyalty within Islamic banking sector. It emphasizes that Islamic banks should combine religious values with clear financial benefits to encourage more people to choose Shariah-compliant banking options.

The impact of Artificial Intelligence on Sustainable Growth: The Mediating Role of Digital Transformation

Muhammad Abdullah Hassan

Hailey College Banking and Finance University of the Punjab

Dr. Waqas Baig

Hailey College Banking and Finance University of the Punjab

Dr. Hafiza Sobia Tufail

Griffith University, Brisbane, Australia

Dr. Ahmad Usman Shahid

Sydney, Australia

Abstract

This study investigates the impact of artificial intelligence (AI) on sustainable growth with digital transformation as a mediating factor. As businesses increasingly adopt AI technologies, understanding their role in promoting sustainable practices is difficult to achieving long-term environmental, economic and social impacts. The study examines how AI initiatives integrated into a digital transformation framework can generate sustainable growth by increasing efficiency, optimizing resource utilization, and driving innovation. By examining the mediating effects of digital transformation. This study provides a comprehensive understanding of how AI advances the Sustainable Development Goals, offering strategic insights for organizations seeking to align technological advancements with the Sustainable Development Goals. The findings of this study contribute to the literature on AI and sustainability by highlighting the transformative potential of digital innovation in achieving global sustainable development goals.

Keywords: Digital Transformation (DT), Artificial Intelligence (AI), Sustainable Growth (SG)

The Role of Green CSR in determining Environmental Attitude towards Green Purchase Intention

Mariyam Mustafa

Hailey College of Banking and Finance

Dr. Waqas Baig

Hailey College of Banking and Finance

Dr. Hafiza Sobia Tufail

Griffith University, Brisbane, Australia

Dr. Ahmad Usman Shahid

Sydney, Australia

Abstract

The main objective of this study was to examine how green CSR enhance the green purchase intention among the people in the banking sector of Pakistan. The data was collected from 300 persons engaged in Pakistan's banking sector. To assess the hypothesized hypothesis, the macro process inside the Statistical Package for the Social Sciences (SPSS) was utilized. The data revealed a significant correlation among green environmental attitude, green CSR and green purchase intention. The findings indicated a significant mediating link among green environmental attitude, green CSR and green purchase intention. Business leaders must endeavour to effectively involve others in their job by earning their trust. This may allow employees to engage in new activities, which would enhance the organization's overall work behaviour. This study will examine several perspectives on how green environmental attitude enhances the green CSR and green purchase intention in the Banking Sector of Pakistan.

Unraveling the nexus between Public Spending and Sustainable Development: A Dynamic Panel Data Analysis of Developing Countries

Ayesha Siddiq

University of Management and Technology, Lahore

Muhammad Hassan Danish

University of Management and Technology, Lahore

Abstract

The purpose of this study is to investigate the nexus between public spending and sustainable development in developing countries. This study examines the relationship between variables using panel data analysis for 59 developing countries, over the period from 2006-2022. For the dynamic model, estimations of generalized moments of methods (GMM) and panel 3SLS are used to capture endogeneity and unobserved heterogeneity, while for the robustness check, fixed and random effects are also applied. Regression findings of generalized moments of methods show a negative and significant effect of public spending on sustainable development in developing countries. The study results indicate that a significant amount of government spending directed to the national debt as well as high military and defense expenditures also drains revenue to projects for sustainable development. Although, the findings also indicate that sustainable development has a significant and positive impact on public spending in developing countries. This study enlists recommendations for emerging countries governments should spend on healthcare and education that can empower people, increase human capital, and lower poverty. A highly educated and skilled workforce is more likely to innovate new ideas, discover new technologies, and contribute to industry developments. Consequently, human capital can play an imperative role in promoting sustainable development and prosperity.

Keywords: Public Spending; Sustainable Development; Globalization; Two-Step System GMM; Panel 3SLS.

Developing Economies: The Mediating Role of Financial Literacy

Saeeda Batool

Hailey College of Banking & Finance, PU

Fareeha Waseem

Hailey College of Banking & Finance, PU

Abstract

In developing economies, financial inclusion has become a critical driver of economic empowerment, poverty reduction, and sustainable development. However, traditional banking services often fall short in reaching underserved populations due to geographical, economic, and educational barriers. Digital banking has emerged as a promising solution, offering affordable, accessible, and user-friendly financial services to unbanked and underbanked communities. This study investigates the impact of digital banking on financial inclusion in developing economies, with a specific focus on the mediating role of financial literacy. The study examines whether access to digital banking services—such as mobile banking, digital wallets, and online payments—can significantly enhance financial inclusion by increasing the number of individuals who can engage with financial services. While digital banking provides essential tools, financial literacy is equally crucial, as individuals must understand how to effectively use these services to maximize their benefits. Therefore, we introduce financial literacy as a mediating variable, hypothesizing that it bridges the gap between digital banking availability and meaningful financial engagement. We assess financial literacy in terms of users' ability to manage finances, make informed financial decisions, and effectively navigate digital platforms. Data will be collected through surveys and interviews with individuals across different demographics in selected developing economies. Using a structural equation modeling approach, we analyze the relationships between digital banking, financial literacy, and financial inclusion. This method allows us to capture both direct and indirect effects, offering a nuanced view of how these factors interact to improve financial inclusion.

Our findings are expected to contribute to the ongoing dialogue on digital financial empowerment in emerging markets. By highlighting the importance of financial literacy in digital banking initiatives, this research aims to inform policymakers, financial institutions, and development agencies about the need for integrated strategies that not only expand digital access but also prioritize education on financial management. Such a holistic approach could better support marginalized communities in achieving lasting financial inclusion and economic stability.

Keywords: Digital banking, financial literacy, financial inclusion

**Promoting Financial Inclusion in Yemen: Strategies and
Recommendations**

Mr. Ramzi Abdullah Ahmed Hassan
Swami Ramanand Teerth Marathwada University
Nanded City, Maharashtra, INDI

Abstract

Financial inclusion refers to the effort to bring as many people as possible within the scope of the financial system. It has become a key focus for governments and financial institutions worldwide. Financial inclusion has recently been a concern in Yemen, with many individuals still lacking access to primary financial products and services. This research paper aims to explore the challenges and opportunities for promoting financial inclusion in Yemen and to provide strategies and recommendations for increasing access to financial services in the country.

To understand the current state of financial inclusion in Yemen, this research paper will examine a range of indicators, including the percentage of individuals who own financial accounts or debit cards, the purposes for which individuals borrow money, and the methods used to save and make payments. The paper will also consider the impact of demographic and socio-economic factors on financial inclusion in Yemen and the role of digital tools and borrowing and saving in financial inclusion.

Overall, this research paper aims to provide a comprehensive analysis of the current state of financial inclusion in Yemen, and to offer practical recommendations for promoting financial inclusion in the country. Increasing access to financial services and products makes it possible to promote economic development and improve the well-being of individuals and communities in Yemen.

Keywords: Indicators, Financial inclusion, Yemen

Role of Transformational Leadership on Innovative Work: Evidence from service sector of Pakistan

Mubeen, Mphil Scholar

Hailey College Banking and Finance, University of the Punjab, Lahore

Dr. Waqas Baig, Assistant Professor

Hailey College Banking and Finance, University of the Punjab, Lahore

Dr Hafiz Ahmed Ullah, Assistant Professor

Institute for Art and Culture Federal Chartered Degree Awarding Institute, Lahore

Abstract

This research explores the relationship between transformational leadership (TL) and innovative work behavior (IWB) within the context of Pakistani organizations, emphasizing Trust in leader (TIL) as a mediating variable. Inspiration, intellectual stimulation, tailored concern, and idealized impact from transformational leadership may boost staff innovation. According to conservation of resources theory, TL offers psychological resources for creative engagement and inventive problem-solving. Trust in the leader creates a safe space for workers to experiment and share new ideas, increasing TL-IWB connections. To guarantee a diverse leadership and innovation perspective, 300 Pakistani experts from various sectors were surveyed quantitatively. Smart PLS software was used to analyze data using Partial Least Squares Structural Equation Modeling to evaluate direct and mediated effects. This sophisticated statistical approach showed varied linkages to support the theoretical framework and assumptions. The strong positive correlation between TL and IWB implies that transformative leaders foster innovation. Transformational leadership fosters innovation when followers trust their leaders, the study found. Trust encourages employee creativity and innovation. This research helps leaders encourage innovation. Managers may foster trust and transformative leadership to boost corporate innovation. These findings suggest that Pakistani companies need leadership and trust-building programs tailored to their cultural and organizational dynamics to increase employee innovation and organizational success.

Keywords: Innovative Work Behaviour (IWB), Transformational Leadership (TL), Trust in Leader (TIL)

Impact of BDA and AI Capabilities on The Firm Performance with Mediating Role of Data-Driven-Culture

Riffat Sabir

Hailey College of Banking and Finance, University of the Punjab, Lahore

Fareeha Waseem

Hailey College of Banking and Finance, University of the Punjab, Lahore

Abstract

In the era of digitalization, role of Artificial Intelligence and Bid Data Analytics have become crucial in assessing the performance of an organization. Keeping in view this technological dynamics, the study aims to investigate the impact of big data analytics artificial intelligence capability in improving the firm operational and financial performance. It inculcates the mediating role of data driven culture based on the resource based view theory and dynamic capability theory on the relationship[between the BDA And AI on Firm Performances. Data is collected from employees of Technology industry in the District Lahore, Punjab, Pakistan. Hypothesis (Direct and Indirect) were attested by using quantitative method, employing PLS-SEM with the help of Smart PLS4 to confirm the measurement model. Our findings illustrates that BDA-AI, AI capability and Data Driven Culture have significant positive effects on the operational as well as financial performance of a firm. DDC mediates the relationship between AI capability and operational and financial performance. This research examined the firm operational financial performance in line with the dynamic capability theory in the Tech-Industry of Pakistan. This research would be highly valuable for researchers, IT experts, administrators/directors/owners, and policymakers to achieve the competitive market's goals by leveraging the BDA-AI in the IT-Industry. This study provides the insights that would be helpful in understanding how DDC impacts firms' operational and financial by leveraging BDA-AI and AI capability in their businesses. In this view, the policymakers make strategies and policies with the use of advanced technologies regarding artificial intelligence and its support to a firm's operational and financial performance.

Keywords: BDA-AI, AI Capability, Data-Driven Culture, Operational Performance, financial firm performance.

AI and the future of employment and higher education: will it increase or decrease inequality?

Prof. Dr. Muhammad Ashfaq

IU International University of Applied Sciences Germany

Abstract

Higher education has been undergoing a great deal of transformation and many megatrends are shaping the future of it. In recent years, we have witnessed an increased level of digitalization and hybrid learning in higher education institutions worldwide, especially after the Covid-19 pandemic. Personalized and lifelong learning is another megatrend that is gaining importance. Through the advancement of Artificial intelligence (AI), there is growing use of automation and AI in teaching and operational areas of education. However, higher education is also facing many challenges such as affordability and access to quality education, especially in developing and poor countries.

Higher education institutions are poised to help students by equipping them with the necessary skills that can help them navigate social, digital, personal, and ecological transitions. Moreover, Higher education institutions are constantly under pressure to apply automation, AI, and machine learning tools to optimize teaching delivery, assessment, and evaluation. It is not wrong to say that now we are living in the age of customization where customers (students) are empowered to demand new levels of engagement and personalization, especially Generation Z which demands high-quality, affordable education delivered flexibly. There is a growing need to develop next-generation learning systems for students and career platforms to connect them with the industry in a seamless manner. Affordability and access to quality education emphasize the importance of developing new learning models and in this regard, distance/blended learning could play an important role in flexibly providing affordable education. IU International University of Applied Sciences, a state-accredited private higher education institution with more than 130,000 students based in Germany has developed the most comprehensive distance learning platform using AI and pioneered an AI study buddy called Syntea (synthetic teaching assistant) to support the students 24/7 in their learning journey.

Keywords: Higher education, AI, employment, Germany, automation, machine learning

Uncovering the path to socially responsible investment: the role of investor characteristics and social investing efficacy

Iraj Shahbaz

Hailey College of Banking and Finance, University of the Punjab, Lahore

Dr. Zarghamullah Khan

Hailey College of Banking and Finance, University of the Punjab, Lahore

Dr. Muhammad Bilal

Hailey College of Banking and Finance, University of the Punjab, Lahore

Abstract

In 2015, the United Nations established 17 sustainable development goals (SDGs) to build a better and more sustainable future. These sustainable goals were set to solve a wide array of issues, including environmental concerns such as climate change, social problems like gender inequality and ethical behavior such as supporting animal rights (Blume, 2021; H'ak et al., 2016). This study aims to explore the determinants of socially responsible investment (SRI) intentions among individual investors in Pakistan. The study will focus on understanding the impact of altruistic values, Biospheric values, knowledge of SRI, and religiosity on SRI intentions. Additionally, the research will examine the mediating role of social investing efficacy and the moderating effect of risk propensity in these relationships. Data will be collected through a structured survey administered to a convenience sample of individual investors, using established scales to measure each construct. The analysis will be conducted using structural equation modeling (SEM) to test the hypothesized relationships. The anticipated outcomes of this study are expected to provide valuable insights into the psychological and value-driven factors that influence SRI intentions, contributing to the development of strategies for promoting ethical investment practices in Pakistan. The findings from this research could have significant implications for multiple stakeholders such as: Understanding the psychological and value-based factors that influence SRI can help individuals make more informed decisions that align with their personal beliefs and values. Insights from this study could guide financial advisors and institutions in developing more tailored investment products and services that cater to the growing demand for SRI option. The results could inform policy makers aiming to encourage sustainable investing practices, providing evidence to support policies that promote SRI. This study will contribute to the existing body of knowledge by offering empirical evidence on the interplay between personal values, knowledge, religiosity, and perceived efficacy in SRI. It will provide a nuanced understanding of how these variables interact, which could inform future research and theory development in the fields of finance, psychology, and ethics.

Bridging the Green Gap: Examining Sustainable Consciousness, Values, and Influences on Green Consumption Intentions Among Gen Z and Millennials

Muhammad Tanveer Ikram

Hailey College of Banking and Finance, University of the Punjab, Lahore

Dr. Zargham Ullah Khan

Hailey College of Banking and Finance, University of the Punjab, Lahore

Abstract

As environmental concerns intensify globally, the gap between consumers' pro-sustainability attitudes and their actual purchasing behavior remains a significant challenge. This study investigates the factors influencing **Green Consumption Intention (GCI)** among Gen Z and Millennial consumers, focusing on the roles of **Consumer Sustainable Consciousness (CSC)** and **Consumer Sustainable Values (CSV)**. Additionally, this research explores **Green Self-Identity (GSI)** and **Eco-Literacy (EL)** as mediating variables, along with **Social Influence (SI)** and **Government Support (GS)** as moderators. Using a quantitative survey-based approach, the study collects data from diverse Gen Z and Millennial participants and applies **Partial Least Squares Structural Equation Modeling (PLS-SEM)** to analyze complex relationships among the constructs.

Findings are expected to provide a nuanced understanding of how personal values, social contexts, and external support drive green consumption behaviors, aiming to bridge the prevalent attitude-behavior gap. This study offers valuable insights for policymakers and businesses seeking to foster sustainable consumption patterns through targeted strategies and interventions. By addressing the dynamics that transform sustainable intentions into tangible actions, the research contributes to advancing the fields of environmental psychology, consumer behavior, and sustainable development.

Keywords: Green Consumption Intention (GCI); Consumer Sustainable Consciousness (CSC); Consumer Sustainable Values (CSV); Green Self-Identity (GSI); Eco-Literacy (EL) ; Social Influence (SI); Government Support (GS)

Influencing green agenda: Factors affecting green purchase intentions of Gen Z

Afra Zafar

Hailey College of Banking and Finance, University of the Punjab, Lahore

Dr. Zargham Ullah Khan

Hailey College of Banking and Finance, University of the Punjab, Lahore

Dr. Muhammad Bilal

Hailey College of Banking and Finance, University of the Punjab, Lahore

Abstract

This study investigates the factors influencing Generation Z's green purchase intentions, focusing on both external factors (green marketing communication, sustainability product attributes, and social influence) and internal factors (perceived behavioral control and perceived consumer effectiveness). The study integrates the Theory of Planned Behavior (TPB) and Signaling Theory to explore how these variables shape Gen Z's green purchase intentions. Given the urgency of environmental issues and the rising influence of Gen Z in global markets, this research is significant. The study employs a cross-sectional survey design with convenience sampling to ensure a representative sample of Gen Z consumers. Data will be collected through a survey questionnaire, utilizing established and validated scales to measure the variables. Structural Equation Modeling (SEM) will be used to analyze the data, allowing for the examination of complex relationships between the variables. This research aims to provide actionable insights for businesses, policymakers, and educators, contributing to the development of strategies that promote green purchase intentions among Gen Z, ultimately supporting broader environmental goals.

Keywords: Sustainable product attributes, Green marketing communication, Perceived consumer effectiveness, Perceived behavioral control, Environmental attitude, Environmental concern

Empowering Entrepreneurial Intentions Through Digital Readiness and E-Learning

Muhammad Baqar Naqvi

Hailey College of Banking and Finance, University of the Punjab, Lahore

Dr. Zargham Ullah Khan

Hailey College of Banking and Finance, University of the Punjab, Lahore

Dr. Usman Sarwar

Hailey College of Banking and Finance, University of the Punjab, Lahore

Abstract

The digital revolution has transformed the educational ecosystem, opening new opportunities to foster entrepreneurial ambitions through e-learning platforms. This research discovers the relationships between digital readiness and e-entrepreneurial intentions. Based on the Theory of Planned Behavior (TPB) and Technology Acceptance Model (TAM), this study investigates how digital readiness influences attitudes of students toward e-learning, which subsequently affects entrepreneurial aspirations through the moderating role of perceived behavioral control. Data collection includes multistage sampling of final-year undergraduate students from universities in Lahore and Islamabad. By integrating digital readiness and entrepreneurial frameworks, this research contributes to educational policies, enhancing e-learning strategies that foster both academic success and entrepreneurial skills. The insights gained can help universities design targeted e-learning modules, promote a culture of innovation, and equip students with essential skills for digital entrepreneurship.

Keywords: Digital readiness, E-learning, E-Entrepreneurial intentions, Technology Acceptance Model, Theory of Planned Behavior, Perceived behavioral control

Impact of credit risk on Islamic Banks profitability in Pakistan with the Mediating role of macro-economic factors

Noor Fatima

Hailey College of Banking and Finance, University of the Punjab, Lahore

Prof. Muhammad Idress

Hailey College of Banking and Finance University of the Punjab, Lahore.

Abstract

This research work therefore uses quantitative research method to assess the impact of credit risk on the profitability of Islamic banks in Pakistan with macroeconomic factors as moderators. Being causal in its research design, it seeks to identify cause and effect relationships between credit risk, changes in macroeconomic factors and bank profitability while identifying the effects of external macroeconomic factors on this relationship. Thus, the research uses an approach of hypothesis development based on prior literature and theories and hypothesis testing with real financial data. The study seeks to cover all the fully operational Islamic banks in Pakistan for the study period, the study uses secondary data from the banks' annual reports and from other reliable sources such as the State Bank of Pakistan, Pakistan Bureau of Statistics, and the World Bank for macroeconomic data. Using data from 2019 to 2023, regression and path analysis are used in this study to test the moderation effects of GDP growth, inflation, and exchange rates on the relationship between credit risk and profitability based on Baron and Kenny's (1986) mediation model. The results of this study will be useful for policymakers and the banking industry to enhance the risk management practices of Islamic banks in Pakistan and other comparable economies

Keywords: Profitability, Credit Risk, Islamic Banking, Macroeconomic Factors, NPLs, ROA, ROE

Exploring the Effect of Supportive Leadership on Team Performance: The Role of Goal Clarity and Trust as Mediators

Tayyaba Jameel

IBMS, The university of Agriculture, Peshawar

Faisal Hanif

Capital University of Science and Technology, Islamabad

Abstract

This study explores how supportive leadership affects team performance and the key roles of goal clarity and trust in teams. Using data from 171 project team members in IT organizations in Rawalpindi and Islamabad, the research applies the Path-Goal Theory of Leadership. It focuses on how goal clarity and trust in teams mediate the relationship between leadership and performance. The analysis confirms that supportive leadership strongly influences team performance. These results offer practical advice for managers aiming to improve team performance in similar settings and contribute to a deeper understanding of how to enhance team effectiveness in project-based organizations.

Keywords: Supportive Leadership, Team Performance, Goal Clarity, Trust in Team, Management Science

Financial Determinants of Corporate Failure: Empirical Evidence from Pakistan

Amna Amin

Hailey College of Banking and Finance, University of the Punjab, Lahore

Abstract

Corporate failure refers to the situation where a business entity, typically a corporation experiences significant financial distress or operational challenges that hinder its ability to continue normal business operations. This study is to investigate the significance and accuracy of financial distress prediction models like Altman (1968), Ohlson (1980), and Zmijewski (1984) as the most accurate indicator of corporate failure for a sample of 40 listed corporations from 5 sectors of Pakistan from 2012 to 2022. Empirical results depicts that Ohlson O-Score model is more reliable and used in forecasting corporate failure and has highest degree of accuracy in comparison to the other models. For future studies, empirical results suggest that increasing the sample size of firms and extending the research duration can produce higher-quality outcomes. Empirical results have implication for firms, regulator and potential investor

Keywords: Corporate failure, financial distress, Altman Z-score, Ohlson O-score, Zmijewski X-score model.

Audit Committee Characteristics and Environmental Disclosure: Empirical Analysis

Abstract

This study investigates audit committee (AC) characteristics effect on environmental disclosure (ED) in 13 listed banks on Pakistan Stock Exchange. The research develop hypothesis about the relation among audit committee independence, audit committee financial expertise, audit committee size, audit committee gender diversity, and frequency of audit committee meeting, and environmental disclosure. Despite advancements in reporting standards, many firms still disclose environmental information voluntarily and with varying quality. The audit committee, with its pivotal role in overseeing both financial and non-financial reporting, is hypothesized to significantly influence the quality of environmental disclosures. Researchers examined how different AC attributes influence ED extent and quality, including size, independence, gender diversity, and financial expertise. Utilizing a sample of thirteen banks for the financial year ending December 31, 2023, this study employs data from annual and sustainability reports and relevant disclosures on the banks' websites. The investigation reveals larger audit committees, those with higher independence, greater gender diversity, and significant financial expertise, are positively linked via improved environmental disclosure. The findings underscore the importance of robust audit committee characteristics in enhancing corporate transparency and accountability regarding environmental performance. This study contributes by linking AC features with ED and offers insights for managers, policymakers, and regulators aiming to improve environmental reporting practices in emerging economies.

Keywords: Environmental Disclosure, Gender Diversity, Audit Committee, Firm Size, Expertise.

Examining the factors that influence employees' contentment with electronic tax systems

Dr. Hafiz Ahmed Ullah

Institute for Art & Culture, Federally Chartered Degree Awarding Institute, Lahore, Pakistan

Farah Kainaat

Institute for Art & Culture, Federally Chartered Degree Awarding Institute, Lahore, Pakistan

Dr. Rizwan Qaiser Danish

Institute of Business Administration, University of the Punjab, Lahore, Pakistan

Abstract

Governments throughout the world have embraced the current ICT revolution, and they are gradually investing in e-taxation systems. The level of employee satisfaction with e-tax systems has a significant impact on their success. The majority of studies focused on evaluating E-Tax systems from the standpoint of taxpayers. This research analyzed Pakistan's Electronic Tax System from the perspective of its employees. Employee feedback on their satisfaction with the system was obtained quantitatively. This study employed a sample of 147 employees and a 29-item measure. The results showed that perceived ease of use, IT background, incentives, and social impact are all significant determinants of employee satisfaction. In this relationship, perceived usefulness had no meaningful effect. This research can assist tax authorities improve their electronic systems by establishing a staff capable of increasing citizens' faith in the system. This article applied the TAM model and offers actual evidence to back up the conclusions.

Keywords: E-government; E-tax; TAM; Information Technology; Employees Satisfaction.

Assessing the Impact of Financial and Legal Constraints on Firm Growth and Survival: A Meta-Analytical Approach

Rabia Yousaf

Institute Of Business Administration, University of The Punjab, Lahore, Pakistan.

Rizwan Qaiser Danish

Institute Of Business Administration, University of The Punjab, Lahore, Pakistan.

Abstract

This study explores the critical financial and legal constraints impacting firms and examines how these limitations influence their growth and survival across varying market environments. With a focus on small and medium enterprises (SMEs), this research highlights the challenges these firms face in maintaining productivity, navigating regulatory frameworks, and sustaining profitability within a competitive landscape. A meta-analytical approach was employed, consolidating findings from a broad selection of empirical studies that assess financial and legal constraints on firms. By aggregating and analyzing data across multiple studies, this research provides a comprehensive understanding of the multifaceted effects these constraints have on firm management, market participation, and overall economic resilience. The analysis reveals that financial and legal constraints not only restrict the operations of large firms but also severely impede SMEs, which often lack the resources to absorb such challenges. Critical financial barriers include limited access to capital, high borrowing costs, and inflationary pressures, all of which elevate operational costs and reduce profitability. Similarly, legal constraints, such as regulatory compliance and complex tax obligations, limit managerial flexibility and hinder firms' strategic growth initiatives. External economic factors exacerbate the challenges firms encounter. For instance, inflation drives up production costs, decreasing profit margins, while rising interest rates discourage firms from pursuing growth opportunities that involve borrowing or high-risk investments. Furthermore, the regulatory burden from complex legal requirements restricts firms' capacity to adapt and innovate, thereby reducing their competitiveness. SMEs, which already operate on limited margins, are particularly vulnerable to these pressures and often face greater risk of market exit. The findings underscore the importance of proactive policy interventions aimed at alleviating financial and legal constraints, especially for SMEs. Such policy measures could include enhancing access to financing, simplifying regulatory compliance, and stabilizing inflation and interest rates. Addressing these issues not only supports firm resilience but also strengthens the broader economic environment by enabling firms to thrive, innovate, and contribute to sustainable growth.

Keywords: Financial constraints, Legal constraints, Firm growth, Firm survival, Profitability, Inflation impact, Interest rates, Regulatory compliance, Small and Medium enterprises (SMEs), Meta-analysis, Economic resilience, Policy interventions

Factors Affecting Compulsive Buying Behavior Through Panic Behavior Disorder in the Pakistani Market

Ibrar Mansoor

University of Education, Lahore.

Meryum Rehman

University of Education, Lahore.

Eman Fatima

University of Education, Lahore.

Fatima

University of Education, Lahore.

Abstract

A tremendous growth is being experienced in the contemporary times by beauty products and has become one of the leading industries in the world. The objective of this research thesis is to study Consumer Panic Behavior Disorder regarding cosmetic products. This research would be conducted in Lahore city and a survey method would be used to collect data from female student respondents. Cosmetic products are an integral part of the nation's economy with its huge potential. The present day's cosmetic industry covers a wide range of products and services. The theoretical aspects of consumer behavior and cosmetic products comprises of two segments, the first segment includes related to evolution of consumer behavior factors affecting the consumer behavior, types of consumer behavior and consumer decision making process. Cosmetic companies, marketing agencies and influencer marketing aims to determine significant factors affecting the Buying Behavior and recommendation of consumers in the beauty and cosmetics industry. The study would also examine the effect of influencer marketing and peer pressure on compulsive buying behavior through panic behavior disorder. This research would be helpful to contribute an extra idea and knowledge to cosmetic companies so that they get to know more about the buying behavior of consumers.

Keywords: Influencer Marketing, Peer Pressure, Panic Behavior Disorder, Compulsive Buying Behavior

The Impact of e- HR practices on Employee Retention- A case of Service Industry in Pakistan

Sadia Iftikhar

Institute of Business Administration, University of The Punjab, Lahore, Pakistan.

Rizwan Qaisar Danish

Institute of Business Administration, University of The Punjab, Lahore, Pakistan.

Abstract

The purpose of this study is to find the impact of e-HR practices (e-recruitment, e-training and e-performance management) on Employee Retention. For this purpose, data was collected from employees working in services sector of Punjab. Under services sector the employees working in IT companies were chosen comprising of Subordinates staff, Middle manager and Senior Manager Categories. Overall sample size of 300 was selected from target population. Convenience sampling was used and survey was filled through self-administered questionnaire. For this cross-sectional study Quantitative method was applied with minimum researcher interference under non contrived setting. Final inference was drawn on the basis of 210 usable responses after data screening and cleaning. Results reveal that there is significant positive impact of e-HR on employee retention. The future guidelines of this study and limitations have also been discussed.

Keywords: HR practices, Employee Retention, Service Industry, Pakistan

Understanding the influence of Popup Ads on Customer Response in Modern Marketing: Popup ads Role in Shaping Customer-Brand Relationships

Sitara Kanwal

Institute of Business Administration, University of The Punjab, Lahore

Rizwan Qaiser Danish

Institute of Business Administration, University of the Punjab, Lahore

Abstract

This study examines how popup ads impact customer-brand relationships and customer responses in Pakistan's food delivery industry. Using signaling theory, it investigates how popup ads strengthen customer-brand bonds and influence customer loyalty. The research suggests that popup ads act as strategic tools, conveying messages that foster connections between customers and brands. By focusing on the mediating role of customer-brand relationships, the study proposes that customer-brand relationships serves as a pathway through which popup ads enhance customer responses, making customers more receptive to the brand and driving loyalty. A quantitative method was used to collect data, employing an administrated questionnaire-based survey. Data was collected through convenience sampling and analyzed using regression analysis. Results demonstrate a positive and significant relationship between popup ads and customer-brand relationships, confirming that well-designed popup ads can indeed strengthen the bond between customers and brands in the food delivery sector. Furthermore, the study finds that popup ads have a beneficial impact on customer responses, notably in promoting brand loyalty, which is essential for sustained business growth in competitive digital markets. Implications and limitations of the findings have also been discussed.

Keywords: pop-up ads, customer-brand relationship, customer response, signaling theory

**Risk Management practices and Prospects of Crop insurance by determining
farmer's willingness to pay: Evidence from district Narowal Punjab,
Pakistan**

Muhammad Usman Mubarik

University of Engineering and Technology, Lahore, Pakistan

Abstract

In the recent years, Pakistan has been affected from utmost meteorology conditions. The two extreme situations floods and drought are likely to be upturn in the future and their frequency and severity would be greater in number. Globally the climatic changes are the biggest threat, agriculture is one of the sector which have been affected the most. The impact of the climatic changes on agricultural sector has caused the major threat to the whole nation for food security. Agriculture is the only sector which have merged in multiple risks either climatic, non-climatic. According to the study, it has observed that the climatic production risk and production facility risk affected to the farmers in district Narowal. Risks in the Agri-sector is a fact, there are the some non-structural measures which are considering as risk managing tools such as crop insurance, subsidize fertilizers and seeds. Risk management practices are necessary to overcome the risk but have not been implemented due to multiple reasons such as lack of information, supporting policies, expertise and the willingness of the farmers to adopt such strategies. This study explains the factors which are influencing the farmers to accept the risk management tool such as crop insurance. The primary data of 384 farmers from one district of Punjab, Pakistan has collected through structured questionnaire. Data has been analysis through binary logistic regression, to investigate the link between dependent and independent variable. The expected outcomes guide the state institution, insurance companies, and the policymakers in executing crop insurance. Additionally, government subsidies and increase the awareness of the benefits about crop insurance. Farmers livelihoods is directly associated with improve outlook of the agriculture sector. The results of this study is the valuable guidance for stakeholders at level.

Impact of Ostracism and Stalking on the Performance of healthcare professionals with the mediating role of quality of life in Pakistani Context

Sakina Bashir

Institute of Business Administration, University of The Punjab, Lahore.

Rizwan Qaiser Danish

Institute of Business Administration, University of the Punjab, Lahore.

Abstract

The purpose of this study is to find the impact of Ostracism and Stalking on performance and to further explore the mediating role of quality of life. For this purpose data was collected from the female nurses enrolled in nurses teaching colleges as well as practicing in affiliated hospitals of Lahore, Punjab. This was a cross sectional study, a quantitative method was applied with minimum interference in a non constraint setting. The data was collected from 400 respondents, using the Quota sampling method, through self administered questionnaires. Final inference was drawn on the basis of 309 usable responses after data screening. The results revealed a negative influence of ostracism and stalking on the performance of nurses. Findings also indicate that quality of life has a partial mediation role in their relationship. The future guidelines of this study and limitations have also been discussed.

Keywords. Ostracism, Stalking, Performance, Quality of Life

How Ethical Leadership affect the Performance of Police Department? A Mediation Mechanism of Work Stress

Sohail Younas

University of the Punjab, Jhelum Campus

Abstract

The aim of this study is to shed light the relationship between ethical leadership and the performance of police department by considering the mediating role of work stress. The research follows the deductive approach with quantitative study and data were collected by questionnaires. The population of this study was police department in the region of Punjab Pakistan. A total 400 questionnaires were distributed among different lower staff of police department (Lahore and Gujranwala divisions) and 353 usable responses were received. This study indicates that there is positive and significant relationship between the ethical leadership and the performance of police department Furthermore, work stress is significantly and negatively associated among these variables. Ethical leadership is a vigorous approach for any organization to accomplish its mission and vision as well as providing direction to achieve its objectives. In addition, researchers identified that employee performance will be improved if their leaders are ethically behave. The performance of Police officers plays a very significant role protecting law and order in the society especially in regard to the infrastructure facilities, manpower and periodic training.

Keywords: Ethical leadership, Work Performance, Police Department, Work Stress

Effect of green logistics on Economic Development at Global Level

Aimon Riaz

Rashid Latif Khan University

Areej Riaz

University of Education

Abstract

As environmental sustainability gains prominence globally, the role of green logistics in fostering economic development has become a critical area of the study. Logistics is an important component of economic infrastructure, and it has been associated with significant environmental challenges such as carbon emissions, resource depletion, and ecological degradation. However, the integration of green logistics—comprising environmentally conscious practices like renewable energy utilization, waste minimization, and eco-friendly supply chain management—offers promising pathways for sustainable economic growth.

This study examines the relationship between green logistics and economic development, with a particular focus on three key indicators: Gross Domestic Product (GDP), foreign direct investment (FDI), and CO₂ emissions. Using a data set covering 55 countries of varying economic development levels—developed, developing, and underdeveloped—over the period 2009–2018, the study employs regression analysis to evaluate the impacts of green logistics on economic performance. The findings reveal a positive and significant relationship between green logistics and both GDP and FDI inflows. Green logistics practices improve logistical efficiency, reduce costs, and enhance a country's attractiveness to foreign investors, contributing to sustainable economic growth.

However, the relationship between green logistics and CO₂ emissions is more distinct. While green logistics is generally associated with reduced environmental impacts, this study highlights complexities arising from diverse regional contexts, irregular emission patterns, and varying levels of adoption of green practices across countries. Notably, developed nations with established green logistics frameworks, such as Australia and Finland, demonstrate substantial reductions in CO₂ emissions. Conversely, countries with limited implementation of green logistics practices exhibit inconsistent outcomes. These findings emphasize the critical need for tailored green logistics strategies to address specific economic and environmental contexts.

Keywords: Green Logistics, Economic Development, GDP, Foreign Direct Investment, CO₂ Emissions, Environmental Sustainability, Renewable Energy, Supply Chain Management.

Exploring the Relationship between Ethical Leadership and Employee Performance through the lens of Emotional Intelligence

Sehrish Amin Khan

Institute of Business Administration, University of The Punjab, Lahore, Pakistan.

Rizwan Qaiser Danish

Institute of Business Administration, University of the Punjab, Lahore, Pakistan.

Abstract

The poor performance of the employees has always been a dilemma for organizations. This is not only affecting working procedures of organizations but is also decreasing talented and qualified workforce. Ethical leadership and emotional intelligence ability assume an important part in improving employee performance. The aim of this study is to explore the relationship between ethical leadership and employee performance through the lens of emotional intelligence. By using questionnaire, data were collected from 320 respondents working in private sector of universities in Pakistan. Simple linear regression and Pearson correlation test were employed to determine the nature of relationship between ethical leadership and employee performance. The results indicated that ethical leadership and leader emotional intelligence influence employee performance. Furthermore, this study verify the strong relationship between ethical leadership and employee performance through the lens of emotional intelligence. The study findings present the observational proof to education sector to familiarize employees with the emotional intelligence ability for enhancing employee performance. The study offers significant importance of possessing effective leadership style and emotional intelligence to academicians in education sectors.

Keywords: Ethical leadership, Employee performance, Emotional intelligence, Mediation

Access to finance, social capital and the improvement of corporate performance: evidence from Southeast Asia.

Dr. Ahmad Usman Shahid

International College of Management, Sydney, Australia.

Abstract

This study examines the influence of access to finance and social capital on the improvement of the corporate performance of non-listed firms in Southeast Asian countries. Furthermore, this paper also explores the mediating role of firms' access to finance between the association of social capital and the improvement of corporate performance. This study utilizes the Bank Business Environment and Enterprise Performance Survey from 2019 to 2023. Specifically, the survey was administered by the World Bank. Data were analyzed using structural modeling in Smart-PLS. The findings show that firms' access to finance and social capital significantly influences the improvement of corporate performance. Additionally, the study's analysis further reports the mediating role of firms' access to finance between the association of social capital and the improvement of corporate performance. This study has implications for governments, regulators, and policymakers for enhancing access to finance and social capital and improving corporate performance. This paper establishes the importance of firms' access to finance and social capital for improving firms' overall performance in the broader context of Southeast Asia.

Keywords: Access to finance, social capital, and the improvement of corporate performance

The Influence of Travel Distance on the Adoption of Online Carpooling: Examining the Moderating Role of Perceived Safety

Ali Noman Ashrif

Institute of Business Administration, University of The Punjab, Lahore, Pakistan.

Rizwan Qaisar Danish

Institute of Business Administration, University of The Punjab, Lahore, Pakistan.

Abstract

This study examines the impact of travel distance on the perceived adoption of online carpooling services, with perceived safety as a moderating variable in Pakistan. Data was collected through a survey, distributed to a sample of 415 individuals through emails and social media. The data collection technique involved structured questionnaires. A non-contrived, cross-sectional methodology was employed for this research. After data cleaning and screening, 387 valid responses were analyzed using SPSS. The results indicate that travel distance positively influences the perceived adoption of online carpooling services, with perceived safety strengthening this relationship, highlighting the importance of safety perceptions in promoting carpooling acceptance. This research contributes to the literature by providing insights into factors affecting carpooling adoption in developing countries, offering valuable implications for policymakers and businesses looking to enhance carpooling services. There are also study limitations, recommendations for future research have also been provided.

Keywords: Travel Distance, Adoption, Online Carpooling, Moderating Role, Perceived Safety

Impact of Financial Sustainability on Credit risk with moderating behavior of Financial Technology Innovation

Iqra Riaz & Rizwan Qaisar Danish

Institute of Business Administration, University of The Punjab, Lahore, Pakistan.

Abstract

Many industries are in false front of sustainability to attract investors either they are not financially sustained. This study demonstrates that how financial technology innovation (Fintech) moderates the relationship between financial sustainability and credit risk. Financial technology innovation includes artificial intelligence (AI) and technologies of machine learning. From KMV model, distance-to-default strategy is used as an inverse proxy to figure out credit risk. For calculus, panel data of sample size 532 selected from the annual financial statements of industries. Quantitative method was used with minimal researcher interference. Final inferences drawn on the basis of 147 responses after data screening and cleaning from outliers. The suggested results reveal that there is a significant negative relationship between financial sustainability and credit risk. Financial technology innovation (Fintech) as a moderator strengthen the relationship between financial sustainability and credit risk. This study helps investors to make sagacious decisions before investment. In addition, industries also get benefit that, which techniques are beneficial for organizations or institutions for credit risk reduction. The future guidelines of this study and limitations held also been discussed.

Keywords: Financial Sustainability, Credit risk, Financial Technology, Innovation

Impact of Leadership Development Practices on Organizational Performance with the mediating role of Affective Commitment

Aneeza Azam |& Rizwan Qaisar Danish

Institute of Business Administration, University of The Punjab, Lahore, Pakistan.

Abstract

The purpose of the study is to find out the impact of two specific Leadership Practices, Mentoring and Action Learning on Organizational Performance and to further explore the mediating role of Affective Commitment. For this purpose, the data was collected from the employees working in Banking Sector of Punjab who were at managerial level in their organization. Overall, sample size of 520 was selected from the target population and were approached through convenience sampling to get the survey filled through self-administered questionnaire. For this cross-sectional research study, quantitative method was applied with minimum researcher interference and in non-contrived setting. Final inference was drawn on the basis of 480 useable responses after data screening and cleaning. The results reveal that there is significant positive impact of selected leadership practices on Organizational Performance and findings also indicate that affective commitment plays partial mediating role in this relationship. These insights can guide bank branch managers responsible for leadership development to adopt the study's recommended practices for more effective employee leadership growth, ultimately enhancing organizational performance. The future guidelines of the research study and limitations have also been discussed.

Keywords: Leadership development practices; Organizational Performance; Affective Commitment; Mentoring; Action Learning

CSR and employee Pro-social and environmental behaviors: The role of Intentions, Climate and Green HRM

Sidra Saleem

Rashid Latif Khan University

Dr. Albert John

University of Lahore

Abstract

This research aims to deepen our understanding of the critical aspect of micro CSR and pro-environmental behaviors of employees in the current era of pollution and environmental degradation. The researcher emphasized and drew attention to the key CSR activities adopted by organizations and their impact on the pro-environmental and pro-social rule-breaking behaviors of the employees. Based on signaling theory, the researcher hypothesized and examined the role of green behavioral intentions and green psychological climate as mediators in the relationship of CSR with pro-environment behaviors and pro-social rule breaking. Furthermore, the researcher also hypothesized and tested the moderation of green human resource management on the relationship of CSR with green behavioral intentions and green psychological climate. The researcher expected to find a positive relationship between CSR with pro environmental behaviors and pro-social rule breaking with the mediating role of green behavioral intentions and green psychological climate as mediators. Parallel mediation exists in the research model. The researcher also expected to find a positive impact of green human resource management practices as a moderator between CSR, green behavioral intentions, and green psychological climate. The author claims that this combination has not yet been explored in past studies. These hypothesized arguments were tested on the data collected from 230 respondents' employees at the middle level of management in different organizations. Process Macro in SPSS is used to hypothesize the model. As hypothesized and in line with the previous research, we found a positive direct relationship between CSR with pro-environmental behaviors and prosocial rule breaking by employees. However, this study also found evidence that the relationship of CSR with PEB and PSRB is mediated by GBI and GPC and moderated by green HRM practices. The study contributes to the organizational behavior and CSR literature. The implications for the researchers and managers are discussed.

Keywords: Corporate Social Responsibility, Pro environmental behaviors, Pro social rule breaking, Green psychological climate, Green behavioral Intentions, Green HRM

Impact of Climate Change on Financial Performance: Evidence from Pakistan Sugar Industry

Abstract

In this era of sustainability and climate change, industries are more concerned towards the impact of climate change on their financial management in Pakistan. By keeping in view, the awareness on climate change impacts are highlighted through different means of communication like emails, webinar, seminar and public campaigns. The adverse impacts of climate change have directly affected the industrial sector. The sugar industry is one of the largest industrial sectors in Pakistan, contributing significantly to the national economy in terms of employment, exports, and raw material for various industries. However, the industry is facing numerous challenges, one of the most critical being the effects of climate change. The aim of this study is to investigate the impact of climate change on the financial performance of sugar industry in Pakistan. This study will explore the impact of climate change on the sugar industry in Pakistan, analyzing the potential consequences of changing weather patterns, changing rainfall patterns, temperature fluctuations, and the increased frequency of extreme weather events. The changing climate poses risks to crop yields, water availability, and sugar production processes, threatening the long-term sustainability of the industry. This study will also determine how these factors affect sugarcane production, sugar mills, and the broader sugar economy of Pakistan. I will collect climate data from Pakistan Metrological Department, WAPDA and other organizations. The results of this study will be helpful for policymakers to make policies for sugar industry keeping in view the industry challenges.

The Moderating Effect of Leader's Humiliation on Job Embeddedness and Employee Retention: A study of Narcissistic & Paternalistic Leadership's Impact

Abstract

In this research paper, the relationships among narcissistic and paternalistic leadership on employee job embeddedness are explored; the moderating role of leader induced humiliation in these relationships is also addressed. This study explores both self-centered and paternalistic leadership, to show how narcissistic leadership outcomes can weaken employee stability while supportive leadership may help improve embeddedness. Results show that narcissistic leadership hurts job embeddedness because it negatively correlates with it, while benevolent and moral leadership help it positively since they correlate optimistically with job embeddedness. Along with leaders' humility, the study examines that humble behaviors reduce the damages of the narcissistic leadership and facilitate employee retention. Using Structural Equation Modeling (SEM), we find that narcissistic leadership has a significant and negative effect on job embeddedness, whereas authoritarian aspects of paternalistic leadership have a nuanced effect which depends on additional organizational factors. The results highlight that fostering job embeddedness and organizational commitment require leadership that is compatible with employees' values. By developing leader-induced humiliation as a moderating factor, this research extends current leadership theories, providing practical understanding of management strategy to focus on employee retention during turbulent economic conditions. The results point to potential benefits from developing benevolent and moral leadership approaches over the tradeoffs in narcissistic leadership styles. The novelty of this exploration lies in its integrated approach to examining leadership styles, job embeddedness, and leader-induced humiliation within a single framework, providing valuable insights into retention dynamics within emerging economies.

Keywords: Narcissistic Leadership, Paternalistic Leadership, Job Embeddedness, Employee Retention, Leader Humility

The Role of AI and Skilled Workers for Business Sustainability: Organizational Culture as the Moderator

Tehmina Fiaz Qazi

Hailey college of banking and finance

Muhammad Sohail Javaid

Hailey college of banking and finance

Nayyab zulfiqar

University of central Punjab

Anam Sajid

Federal Urdu university Of arts, science and technology

Abstract

This study explores the dynamic relationship between Artificial Intelligence (AI), skilled workers, and business sustainability, with a focus on the moderating role of organizational culture. AI is revolutionizing business processes by enhancing efficiency, reducing operational costs, and enabling innovative business models, making it a critical driver of sustainability. Skilled workers play a vital role in ensuring the effective implementation of AI technologies, adapting to new systems, and fostering innovation. However, the integration of AI and human capital is influenced by the organizational culture, which either facilitates or hinders this synergy. Organizational culture acts as a moderator by shaping how AI is adopted and how workers adapt to technological advancements, thus influencing the overall sustainability of a business. This research aims to examine the interdependencies between AI, skilled workers, and business sustainability while assessing how organizational culture can mediate or moderate these interactions.

Keywords: Artificial Intelligence (AI), Business Sustainability, Skilled Workers, Organizational Culture, Technological Integration, Human Capital, Innovation and Efficiency

The impact of participative leadership on innovative work behavior through different mediating mechanisms. Evidence from banking sector.

Laraib Fatima
Mam Anam Masood

Abstract

The purpose of this study is to investigate the impact of participative leadership on innovative work behavior within the banking sector, focusing on proactive personality and psychological capital as mediating mechanisms. Participative leadership, which encourages employee involvement in decision-making, is hypothesized to promote innovative work behaviors by enhancing individual proactive personality and psychological resources. This research study employs both administered questionnaire and online survey as data collection method, collecting data from first line management employees across several banks in Lahore to assess relationships between participative leadership, proactive personality, psychological capital, and innovative work behavior. The anticipated findings are expected to confirm that participative leadership has a significant impact on innovative work behavior and both proactive personality and psychological capital significantly mediate the relationship between participative leadership and innovative work behavior. This study aims to contribute to the literature by representing the pathways through which participative leadership impacts innovation, providing actionable insights for banking sector management to cultivate a more innovative and psychologically empowering workplace environment.

Keywords: Participative leadership, Innovative work behavior, Proactive personality, Psychological capital

Consumer Participation with brands and Loyalty: A Social Commerce Perspective

Waqas Shakir

Superior University, Lahore

Rehab Khan

Superior University, Lahore

Dr. Rizwan Qaiser Danish

IBA, University of the Punjab, Lahore.

Abstract

In the past researchers emphasized and drew attention towards the ways which can be adopted by the brands for making their customers loyal and participative. Social media is one of the most effective mediums for brands to communicate with customers to know their desires and needs. The brand communities with the level of Tradition aren't completely applied the easy way and it is not clear why consumer wishes play the role of contribution & loyalty for the brand establishing for the social media and microblogs. By innovative techniques, the organizations should implement innovative mediums of interaction that capture the intention of the users. The current research highlights that the customer's participation on social media and their loyalty to the brand considered as the most important elements to comprehend the reasons which influence the brand's online communication and social media communities. This research provides empirical proof for understanding predictors for participants and loyalty to the brand in social media and microblogs. Data were collected from the individual user of Facebook (social media site) from Lahore, Pakistan. Results indicated that the research study concluded finally that to get the maximum participation of user on social media and getting their loyalty for specific brand organizations needs to design their strategies in the way that attracts the user and leads their behavior in favor of the brand.

Keywords: customer loyalty, social media, e commerce, brands

Effects of Employer Branding and Religiosity on the organizational Commitment

Maria Saddique

Hailey College of Banking and Finance, Punjab University, Lahore.

Farooq Ashraf

Hailey College of Banking and Finance, Punjab University, Lahore.

Abstract

This study aims to understand the how employer branding (both functional and emotional branding) influences the employee's commitment in the organization in relation to their religious believes. For some Islamic organization, effectively managing employer branding while considering the religiosity of employees can be a strategic approach to employee retention, especially in a religious countrylike Pakistan. Religious values can influence how employees perceive organizational commitment that directly linked to their intentions to quit, especially in the context of Islamic banks. This study also show that the religious value are not just important in personal life but also influence in work related attitudes like organization commitment. The below model answers the important question for an organization: why and when do this factor lead to positive outcomes for an organization.

Keywords: Employer Branding, Religiosity, organizational Commitment

Perceived Insider Status and Thriving at Work: The Moderated Mediation Role of Employee Engagement

Waqas Shakir

Superior University, Lahore

Rehab Khan

Superior University, Lahore

Dr. Rizwan Qaiser Danish

IBA, University of the Punjab, Lahore.

Abstract

Individual works for the betterment of an organization only when considering him to be an insider and valuable part of the organization. The self-determination and affective event theories will be used to draw a model based on Perceived insider status (PIS), employee engagement (EE), and Perceived organizational support (POS). This study will investigate the direct impact by perceived insider status (PIS) upon thriving at work (TAW) & through the mediation of employee engagement (EE). Also, will study the moderating role by perceived organizational support (POS) on the relationship of Perceived insider status (PIS) and employee engagement (EE). Data will be collected from service and manufacturing sector employees by self-administrative questionnaire using a cross-sectional technique. Statistical software IBM SPSS, AMOS, and Hayes PROCESS will be used for the data analysis. This research is supposed to contribute to a more in-depth understanding of the constructs, Perceived insider status, and thriving at work.

Keywords: Insider Status, Thriving at Work, Moderated Mediation, Employee Engagement

How Green Dynamic Capabilities Affect the Sustainable Performance: Mediating Role of Green Innovation

Dr. Ahmed Muneeb Mehta

Hailey College of Banking and Finance, PU, Lahore

Dr. Rizwan Qaiser Danish

Hailey College of Banking and Finance, PU, Lahore

Anita Ali

Hailey College of Banking and Finance, PU, Lahore

Abstract

The objective of this study is to analyze the relationships between green dynamic capabilities, , and sustainable performance. The proposed research also aims to find the green dynamic capabilities as independent, sustainable performance as a dependent, and control variables (firm size, and firm age) through mediating role of green innovation. This study will follow the quantitative research paradigm to investigate the above-mentioned scientific inquiry. A cross-sectional survey-based study will be conducted through a structured questionnaire of Pakistani service sector (banking) employees. The data will be analyzed through descriptive, correlation, and regression analysis. SEM (Structural equation modeling) through AMOS will be applied to study causal relationships and moderation.

Keywords: Green dynamic capabilities, green innovation, sustainable performance, Resource-based view

Investigation Of Key Factors Affecting User Trust In Chatbots Customer Service Agents Among Pakistani Users

Rizwan Qaiser Danish

Institute of Business Administration, University of the Punjab, Lahore.

Noor Fatima

Institute of Business Administration, University of the Punjab, Lahore.

Abstract

In the era of automation, brands are now transforming their human agents into chatbot agents in customer services. Chatbots have now become prevalent in customer services and thus gaining users' trust in chatbots service is paramount. The present study aims at exploring and investigating the key facets behind the customer trust in chatbot customer service. The study uses the Stimulus-Organism-Response framework as theoretical lens through quantitative research design. Overall, 500 respondents were approached to gather the data for quantitative study through survey. The study explored the most influencing dimensions of perceived human likeness and reliability of chatbot and then empirically examined their influence on perceived human likeness and reliability, consequently predicting the customer trust. The results confirmed the model generated through structured equation modelling for hypothesis testing. Although study provides the new insights in existing literature, there are certain limitations and future guidelines have also been discussed.

Keywords: Trust, Chatbots, customer service, factors, agents

Green Banking Development in Pakistan: A way forward

Waqas Shakir

Superior University, Lahore

Rehab Khan

Superior University, Lahore

Dr. Rizwan Qaiser Danish

IBA, University of the Punjab, Lahore.

Abstract

In 21st century, the climate change has become an important issue for businesses as well as stakeholders. Consequently, to reduce carbon emission financial institutions offer green financing to businesses to mitigate this issue. However, the availability of green loan remains the important case. Therefore, this research aims to know how this financing gap can be minimized. A panel design dataset was collected which consists of green financing data for the period 2009 to 2015 from 24 banks operating in Pakistan. We applied Two-stage Least Square Regression Analysis for data analysis. The results revealed that green loans are a less risky investments. Further, the findings also provide useful information to managers who look for grow their business loan and minimize default risk. This study contributes to the existing literature in green financing by filling the gap, particularly for developing countries through empirical evidence. The finding suggests that banks must invest more in green projects.

Keywords: green banking, green financing, green loans, investments, Pakistan

The Impact of Pos-Based Taxation on Retail Business Compliance in Pakistan

Muhammad Waqar Aslam

Hailey College of Banking & Finance, University of the Punjab

Fareeha Waseem

Hailey College of Banking & Finance, University of the Punjab

Abstract

This study examines the impact of Point-of-Sale (POS)-based taxation on retail business compliance in Pakistan, focusing on the effects of digital tax monitoring on tax reporting accuracy, compliance rates, and overall business behavior. With Pakistan's Federal Board of Revenue (FBR) implementing POS-based systems as part of an effort to digitize and formalize tax collection in the retail sector, this research investigates how these systems influence compliance among small to medium-sized retail businesses.

The study employs a mixed-method approach, combining quantitative data on tax revenue and compliance rates with questionnaires from retail business owners. Findings indicate that the introduction of POS-based taxation has led to a significant increase in tax compliance, as the digital systems reduce opportunities for underreporting and ensure real-time data sharing with tax authorities. However, challenges such as system costs, operational complexity, and resistance from traditionally non-compliant businesses have tempered the full impact of these measures. Additionally, the POS-based taxation system has influenced business behavior, with many retailers adopting more transparent record-keeping practices and formalizing transactions to align with the new requirements.

This research highlights the role of digital tax systems in enhancing transparency and accountability within Pakistan's retail sector, while also underscoring the need for government support to facilitate the transition for small and mid-sized businesses. The study concludes that while POS-based taxation is a promising approach to improve compliance, its success is contingent on addressing implementation barriers and fostering a supportive environment for businesses transitioning into digital tax reporting. This work provides valuable insights for policymakers, suggesting that sustained engagement with retailers and incremental adjustments to the POS system may further enhance tax compliance and reduce the informal economy in Pakistan.

Digital Transformation and its Impact on Circular Economy Practices and Environmental Performance: A Pathway to Green Competitive Advantage for SMEs

Nimra Younas

Hailey College Banking and Finance, University of the Punjab, Lahore, Pakistan.

Dr. Ahmed Muneeb Mehta

Principal, Hailey College of Banking & Finance, University of the Punjab, Lahore, Pakistan

Dr. Waqas Baig

Hailey College Banking and Finance, University of the Punjab, Lahore, Pakistan.

Abstract

The present study aims to investigate the impact of digital transformation on the circular economy practices and environmental performance of small and medium-sized enterprises (SMEs), with the ultimate goal of achieving a green competitive advantage. This research is grounded in the Practice-Based View theoretical framework. To evaluate the proposed model, a quantitative research methodology was employed, utilizing survey questionnaires distributed to SMEs in Lahore. Data analysis was conducted using SPSS and Smart PLS. The findings indicate a positive relationship between digital transformation and the green competitive advantage of SMEs. Furthermore, the results reveal that digital transformation significantly influences both circular economy practices and environmental performance. Notably, the study demonstrates that circular economy practices and environmental performance serve as mediators in the relationship between digital transformation and green competitive advantage. The intermediary roles of these factors are found to be substantial. This research highlights the essential role of integrating digital transformation within SMEs to promote sustainable practices and enhance environmental performance, thereby facilitating the attainment and maintenance of green competitiveness. The insights garnered from this study are valuable for SMEs, policymakers, stakeholders, and managers seeking to enhance the competitiveness of SMEs in an increasingly dynamic and competitive business landscape.

Green consumerism, green perceived value, and revisit intention: Insights from Pakistan's Restaurant Industry

Lubna Khalid

Hailey College of Banking and Finance, University of the Punjab, Lahore

Dr. Ahmed Muneeb Mehta

Hailey College of Banking and Finance, University of the Punjab, Lahore

Dr. Waqas Baig

Hailey College of Banking and Finance, University of the Punjab, Lahore

Abstract

The restaurant industry in Pakistan is increasingly adopting green practices to meet the demands of environmentally conscious consumers. This study explores the influence of green consumerism and green perceived value on revisit intention, focusing on how these factors shape customer loyalty in the context of sustainable dining. Additionally, the moderating roles of green perceived quality and previous experience are examined to provide a nuanced understanding of consumer behavior in the green restaurant sector.

Using a quantitative research approach, data were collected through structured questionnaires targeting restaurant patrons in Pakistan who have engaged with eco-friendly establishments. Structural equation modeling (SEM) was employed to analyze the relationships between the independent variables (green consumerism and green perceived value), the dependent variable (revisit intention), and the moderators (green perceived quality and previous experience). The findings indicate that green consumerism and green perceived value significantly enhance revisit intention. Furthermore, green perceived quality and previous experience positively moderate these relationships, amplifying the impact of green practices on customer loyalty.

This research contributes to the growing literature on sustainable consumer behavior by highlighting the importance of green initiatives in fostering customer retention. For restaurant managers, the findings underscore the necessity of delivering high-quality eco-friendly dining experiences and emphasizing perceived value to attract and retain green-conscious customers. In the evolving Pakistani restaurant industry, integrating sustainability into operations not only meets consumer expectations but also provides a competitive edge, fostering long-term business success.

Keywords: Green Consumerism, Green Perceived Value, Green Perceived Quality, Previous Experience, Revisit Intention, Pakistan Restaurant Industry

Promoting Financial Inclusion in Yemen: Strategies and Recommendations

Mr. Ramzi Abdullah Ahmed Hassan

Swami Ramanand Teerth Marathwada University
Nanded City, Maharashtra, INDIA

Abstract

Financial inclusion refers to the effort to bring as many people as possible within the scope of the financial system. It has become a key focus for governments and financial institutions worldwide. Financial inclusion has recently been a concern in Yemen, with many individuals still lacking access to primary financial products and services. This research paper aims to explore the challenges and opportunities for promoting financial inclusion in Yemen and to provide strategies and recommendations for increasing access to financial services in the country.

To understand the current state of financial inclusion in Yemen, this research paper will examine a range of indicators, including the percentage of individuals who own financial accounts or debit cards, the purposes for which individuals borrow money, and the methods used to save and make payments. The paper will also consider the impact of demographic and socio-economic factors on financial inclusion in Yemen and the role of digital tools and borrowing and saving in financial inclusion.

Overall, this research paper aims to provide a comprehensive analysis of the current state of financial inclusion in Yemen, and to offer practical recommendations for promoting financial inclusion in the country. Increasing access to financial services and products makes it possible to promote economic development and improve the well-being of individuals and communities in Yemen.

Keywords: Indicators, Financial inclusion, Yemen

Analysing the impact of high performance work system on employee's response in banking sector

Abstract

This study aims to examine the impact of a High Performance Work System (HPWS) on an employee's response by considering factors like training and education, communication, compensation, employee's participation, and occupational safety. This research mainly focuses on analyzing the impact of HPWS on the employee's response in the workplace in the banking sector of Faisalabad. Employee response considered as dependent variable in this study, while a high-performance work system (training and education, communication, compensation, employee participation, and occupational safety) considered an independent variable. The data was collected by considering the demographic aspects and the positions held by employees. The data collected from respondents by a convenience sampling technique. The data was collected from different banks in Faisalabad. The data was analyzed with the help of SPSS software. The responses used to analyze and interpret the results in an appropriate manner. Statistical analysis shows that job security has the strongest relationship with the employee's response. It was also noted that there was a moderately significant relationship between the employee's response and effective communication.

**Relationship of Transformational leadership and work outcomes
(performance & Satisfaction and OCB): The role of Identification,
Engagement and Personality traits**

Abstract

This study explores the latent medium and periphery position that analyzes the relationship of transformational leadership with work outcomes specially job performance, satisfaction, and OCB while exerting work engagement and organizational identification as mediators. Additionally, probe whether the personality traits (extraversion, neuroticism, and openness to experience) moderate the relationship of transformational leadership with work engagement and organizational identification. Data was collected from 300 airline service sector employees and analyzed through Smart PLS 4.0. Result indicates that work engagement mediates the relationship of transformational leadership with job performance and satisfaction although identification fully mediates the relationship of transformational leadership with satisfaction and organizational behavior citizenship. Result discloses that sequential mediation of work engagement and organizational identification is present in the relationship of transformational leadership with job performance and satisfaction. Moreover, the result shows that the extraversion personality trait moderates the relationship between transformational leadership and organizational identification. This study layout the direction in which conditions and circumstances employees perform the way they often do and what managerial level needs to do to improve their work outcomes. Theoretical and practical implications are also provided.

The Impact of Decarbonization, Green finance and Innovation on Ecological footprints: Moderating Role of Technological Innovations and Influence of Economic factors

Rabiya Usman

Kinnaird College for Women University

Farah Naz

Kinnaird College for Women University

Abstract

Environmental pollution is one of the most important global issues and it also affects the severe health conditions. This study examines the effects of green finance, decarbonization and innovation upon ecological footprints focusing on the influence of economic factors and moderating role of technological innovations. In this study the panel data is from G7 and E7 countries have been taken from 2013 to 2023. Using Linear regression method, the findings explains that innovative practices and green finance have asymmetrical and complex relationship with environment. If there are positive developments in green investments, it reduces ecological footprints over time and hence it lessens the environmental degradation. But economic growth have a dual effect; it can also increase the ecological footprints but under some conditions it can reduce ecological footprints coupled with technological advancements and green innovations.

From Unethical Climate to Unethical Acts: Exploring the Roles of Employee Moral Disengagement, Self-Interest, and Institutional Pressure

Syed Muhammad Aarsal Abbas

Hailey College of Banking and Finance, University of the Punjab, Lahore

Dr. Muhammad Bilal Ahmad

Hailey College of Banking and Finance, University of the Punjab, Lahore

Abstract

This study investigates how leaders' unethical pro-organizational behavior (UPB) fosters an organizational climate prone to unethical practices by influencing employees' moral disengagement and self-interested unethical behavior. Unethical pro-organizational behavior, defined as actions intended to benefit the organization but violating societal standards can result in substantial consequences, as evidenced by major corporate scandals. While prior research has primarily focused on the benefits of UPB, such as its role in normalizing unethical practices, the adverse effects of leaders' UPB on organizational ethics remain underexplored. Drawing on social cognitive theory (SCT), this study proposes that employees internalize leaders' unethical behaviors, leading to a detachment from moral standards and, ultimately, to self-interested unethical conduct. This conduct may collectively escalate into an unethical organizational climate, as suggested by SCT's concepts of abstract modeling and reciprocal determinism. By examining these sequential processes, this research contributes to UPB literature by shifting the focus to the harmful outcomes of leader-driven unethical behaviors and their role in shaping ethical climates. Additionally, it expands SCT's application by illustrating how employees' abstract leaders' behavior principles, leading to unique behaviors beyond mere mimicry. This study also provides a multilevel perspective on how employees' unethical actions contribute to the overarching ethical environment, addressing calls to explore employees' responses to leaders' UPB.

Keywords: Navigating the Dark Side: Exploring the Interplay of Unethical Pro-Organizational Behavior, Moral Disengagement, and Institutional Pressures in Shaping Workplace Ethics

Impulsive Buying in the Digital Age: Omnichannel usage and payment method preferences

Abstract

It is important to consider the consumer behavior in those two domains, online shopping and shopping in physical stores when segmenting the market and developing the marketing strategies. This study looks at the psychological and behavioral factors that relate to impulsive buying with emphasis on the part played by compulsive buying, omnichannel consumption and normative perceptions. A structural equation model (SEM) was employed to analyze the relationships among these constructs using data from two distinct consumer groups: online and in-store shoppers. Multigroup analysis provided further evaluation of the effects of demographic variables on the path coefficients of the developed model. To improve the reliability of the data collected, data screening, validation and reliability check were conducted carefully. The analysis established positive and statistically significant correlations between compulsive buying and impulsive buying across the two modes of shopping. The use of omnichannel also had a large influence on impulse purchases, which more emphatically characterized the online shopping group. Normative evaluations were moderately related to the level of social networking impulsiveness but did not affect impulsive buying indices. The analysis of the three groups separately was consistent with the view that these effects are rather differential across different subgroups, with aggregate type marketing appeals, appearing to help for some subgroups, in some conditions. The study confirms the hypothesis on compulsive buying and omnichannel usage and its impact on impulsive buying and also highlights the necessity of demographic variances consideration when analyzing consumer behavior. These insights which are to be derived from the study could be useful for retailers to formulate better ways of captivating the customers so as to get the best out their sales efforts.

Keywords: Omnichannel Shopping, Social Networking Impulsiveness, Impulsive Buying Behavior, Digital Consumer Behavior, Ethical Marketing Strategy

Quantifying the Impact of E-HRM practices on Sustainable Competitive Advantage: The Mediating Role of Sustainable E-HRM Systems and Moderating Effect of Organizational Agility

Abstract

In the contemporary business landscape, the adoption of Electronic Human Resource Management (E-HRM) practices has become imperative for organizations striving for Sustainable Competitive Advantage (SCA). This quantitative studies aims to elucidate the relationship between E-hrm practices and SCA, with the focus on the multidimensional nature of E-HRM encompassing the Ability of E-HRM practices (AEEP), Opportunity enhancing E-HRM practices (OEEP), and Motivation enhancing E-HRM practices (MEEP). Moreover, this study investigates the mediating effect of Sustainable E-HRM Systems (SEHRMS) and the moderating influence of Organizational Agility (OA) in this relationship. Drawing upon established theories of organizational behaviour and HRM such as Resource based perspective, absorptive capability Idea and Social Exchange Theory which fully define this research with the previous research based work. This research employs a structured survey questionnaire to collect the data from a population size of 119 IT structured organisations through which the Sample size of 300 HR employees participate in this survey. Utilizing the positivist paradigm and convincing the sampling technique. By employing path analysis and moderation analysis, the study seeks to uncover the direct and indirect effects of E-HRM practices on SCA, mediated by SEHRMS, and moderated by OA. Theoretical contribution to organizatinal competitive and sustainability. Practical implications are envisaged in the formulation of strategies to leverage E-HRM systems effectively, enhance organizational agility, and thereby attain sustainable competitive advantage in the dynamic business environment of the digital age.

Keywords: E-HRM Practices, Sustainable Competitive Advantage, Sustainable E-HRM Systems, Organizational Agility, Multidimensional Analysis, Quantitative Study, dynamic business.

Evaluating the effect of toxic leadership on workplace bullying in the different sector of Gujranwala: Mediated-Moderated model of employee silence, psychological wellbeing and employee voice.

Zain Ashfaq

Abstract

This study investigates the impact of toxic leadership on workplace bullying across multiple sectors in Gujranwala, Pakistan, emphasizing the mediating effects of employee silence and psychological well-being, as well as the moderating function of employee voice. A systematic survey was conducted with 384 employees from various industries, and the data was analyzed using structural equation modeling. The findings show that toxic leadership has a significant impact on workplace bullying, with employee silence and psychological well-being acting as essential mediators. Contrary to predictions, employee voice did not moderate the association between toxic leadership and bullying, implying that the impact of toxic leadership is widespread, regardless of employees' willingness to speak up. These results demonstrate how organizations can reduce workplace bullying and enhance employee well-being by addressing toxic leadership and fostering a positive work environment.

Key words: Toxic Leadership, Workplace Bullying, Employee Silence, Psychological Wellbeing, Employee Voice.

Effects of Social Media usage on Reading Habits amongst the students of University of the Punjab

Anusha Khan

Hailey College of Banking and Finance, University of the Punjab

Dr. Fizza Rizvi

Hailey College of Banking and Finance, University of the Punjab

Abstract

This study is focused on the effects of social media usage on reading habits among university students. The specific context of the research is student behavior and media consumption patterns at the University of Punjab, Pakistan. The study focused on Social Media Usage as the independent variable, measured by the daily hours students spend on platforms like Facebook, WhatsApp, YouTube, and Instagram, categorized into time ranges. Reading Habits, the dependent variable, referred to the time students dedicated to reading print materials such as books, newspapers, and magazines, also measured in daily time intervals. Demographics like age, gender, academic program, and year of study served as control variables to account for their potential influence. This study used a quantitative research design with a survey method to collect numerical data. An online questionnaire, shared via WhatsApp, was administered to 40 University of Punjab students using Google Forms. It included two multiple-choice questions about daily hours spent on social media and reading. The data was analyzed using SPSS software, applying Linear Regression and Independent Sample T-tests to explore the relationship between social media usage and reading habits. Based on the findings and the hypothesis, the expected conclusion is that there is no significant effect of social media usage on the reading habits of students at the University of Punjab. The data indicates that despite extensive use of social media by students (with 27.5% spending 8-10 hours per day on social media), the time spent on reading print-based material remains limited. Only a small fraction of students, about 2.5%, spend 8-10 hours reading per day, suggesting a possible inverse relationship, though not statistically significant.

Enhancing Project Success through Effective Communication: The Moderating Role of ICT in Government Projects

Naeem Abbas
Muhammad Sajid

Abstract

Effective Communication plays an important role in all projects particularly in the rapid innovation of information and communication technology (ICT). The purpose of this research is to highlight the effect of communication behaviour and communication quality on project success with prominent focus in Govt. projects. The study provides the crucial role of communication behaviour and communication quality and the moderating role of information and communication technology (ICT) for enhancing the communication commitment and project outcomes. It describes the major components of communication behaviour like accuracy, openness, responsiveness and listening while communication quality includes clarity, relevance, timeliness and consistency and analysing their relations with success of project. Moreover, it draw that how ICT facilitates addressing challenges, communication practices such as different geographical locations of team and need for real-time communication.

By examining the moderation of ICT, the study purpose is to offer insights into how government projects can adopt effective way of communication through integration of information and communication technology (ICT) for better performance of project team. The literature provided a huge gap of accuracy, responsiveness, openness and listening that are the major components of communication behaviour. In the other way, literature also highlight the gap in communication quality like message clarity issues between project manager and team members, irrelevancy of tasks due to miscommunication and inconsistency during project communication. By ICT integration we can enhance the success ratio of the Government Initiatives.

This study also helps in understanding of the importance of communication behaviour and communication quality in the context of Govt. projects success with moderating role of information and communication technology (ICT). We can get a lot of success ratio by tackle the communication barriers of communication behaviour and communication quality between project team and senior management and project manager.

Mindfulness to Enhance Employee Performance in High-Stress Environments: An evidence from IT Sector of Pakistan

Abdul Mateen Yousaf

COMSATS University Islamabad, Lahore Campus

Asma

COMSATS University Islamabad, Lahore Campus

Abstract

Nature and intensity of employee's varies organization to organization. IT organization are among those where stress plays a significant role to employee outcomes. Special sitting and standard working environment is the realization of the importance of stress of IT sector employee. A study was conducted to highlight the perception and inclusion of mindfulness concept in IT firms. The study also highlighted the need to investigate the emotion and their nexus with mindfulness. Around 550 IT employees were targeted to investigate the mindfulness and its consequences on their performance. Analysis was done using AMOS and SPSS, Results showed significant importance of non-tangible asset like mindfulness.

Green Human Resource Management and Sustainable Performance with the Mediating Role of Green Innovation: A Perspective of New Technological Era

Esha Khalid Butt

Hailey College of Banking and Finance, University of the Punjab, Lahore.

Dr. Waqas Baig

Hailey College of Banking and Finance, University of the Punjab, Lahore.

Abstract

In this era of sustainability increasing environmental concerns and the need for sustainable practices have resulted in a call for environmentally, economically, and socially sustainable practices in manufacturing organizations. Every organization now has an obligation to balance its economic, social, and environmental performance, especially those that operate in a highly competitive and regulated environment. The purpose of this study is to investigate the relationship between green human resource management bundle practices, green innovation and their impact on sustainability performance as measured by the Triple Bottom Lines (i.e., environmental, social, and economic performance). In this study the researcher use quantitative approach in order to collect data from small- and medium-sized (SME's) businesses operating in the Pakistan through a customized survey. Green innovation has a significant impact on sustainable performance and green innovation partially mediates the relationship between green human resource practices and sustainable performance of SME's. This study will demonstrate that the implementation of Green Innovation by firms can be enhanced through the use of GHRM, which, in turn, would enhance the firms' sustainability. Additionally, the study will also show that environmental management practices in the human resource and innovation sectors can result in greater sustainability.

Keywords: GHRM (Green Human Resource Management), GI (Green Innovation), SI (Sustainable Innovation).

The Impact of Electronic Customer Relationship Management (E-CRM) on Customer Loyalty: Evidence from the Banking Sector

Abstract

The rapid advancements in technology have transformed traditional customer relationship management (CRM) into electronic CRM (E-CRM), offering enhanced tools to engage customers. This study investigates the impact of E-CRM on customer loyalty in the banking sector, focusing on mediating mechanisms such as customer satisfaction and performance expectancy. Drawing on the Technology Acceptance Model (TAM) and Expectancy Confirmation Theory (ECT), the research highlights how E-CRM practices, including personalized services, efficient digital communication, and user-friendly interfaces, significantly enhance customer satisfaction. This, in turn, positively influences performance expectancy, where customers perceive banking services as efficient, reliable, and meeting their expectations. These factors collectively strengthen customer loyalty by fostering trust and repeated engagement with the bank. Data collected from banking customers across multiple demographics substantiate the role of E-CRM as a pivotal driver for maintaining long-term customer relationships in a competitive financial landscape. The findings underscore the necessity for banks to optimize their E-CRM systems to cater to customer expectations and reinforce loyalty. Future studies could explore cross-industry comparisons to generalize the impact of E-CRM in other service domains.

Keywords: E-CRM, Customer Satisfaction, Performance Expectancy, Customer Loyalty

Leadership Impact on Organizational Performance in Pakistan's Textile Industry

Muhammad Waqar Aslam

Hailey College of Banking & Finance, University of the Punjab

Dr. Waqas Baig

Hailey College of Banking & Finance, University of the Punjab

Abstract

In this study we discuss about Leadership behaviors and styles influence productivity, employee engagement, creativity, and financial success. This study examines how transformational, transactional, and servant leadership styles affect organizational performance using empirical data and current literature. According to research, transformational leadership, visionary goal-setting and inspiring influence improves employee engagement, creativity, and organizational performance. Transactional leadership, with organized management and performance-based rewards, improves operational efficiency and short-term productivity but not innovation and flexibility. Servant leadership prioritizes employee welfare and business ethics, increasing trust, loyalty, and staff retention. Leadership influences organizational culture which helps to study the organizational performance. Leaders who stress clear communication, accountability, and collaboration boost staff morale and commitment, improving teamwork and productivity. However, poor or dictatorial leadership often leads to lower employee engagement, more turnover, and organizational instability. The research shows that leadership development is a strategic advantage for organizations adapting to competitive and changing business environments. This study shows stakeholders that effective leadership development and adaptive leadership practices are crucial for organizational performance and resilience.

Impact of Inventory Management on Organizational Competitiveness: The Mediating Role of Agility in Inventory Management and the Moderating Effect of Employee Training and Development in

Pakistan's IT Sector.

Syed Dabeer ur Rehman

Bahria University Lahore Campus

Dr. Khurram Jaffery

Bahria University Lahore Campus

Abstract

In this study, Inventory Management Practices (IMP) is considered as a vital contributor in Organizational Competitiveness (OC), which in turn is mediated by Agility in Inventory Management (AIM) and moderated by Employee Training and Development (ETD). The contribution of the research is to point out the increasing need in the IT industry for proper inventory practices to support the competitiveness of IT firms against the very rapid technological and market changes the industry attracts. Research in inventory management is progressing globally, however Pakistan's IT sector is looked ashore and crucial gaps to knowledge exists in between how agility, and training impact organizational performance. The findings aim to fill contextual research gaps by offering theoretical contributions as well as practical recommendations for IT firms to efficiently manage their inventories, support adaptability, and open up opportunities for the organizations to strengthen workforce capabilities for sustained competitiveness so as to thrive in their external context.

Digitalization And Sustainability: An Integrative Literature Review Through Taxonomy Development

Waheed Akram

National University of Modern Languages, Lahore, Pakistan

Dr. Kashif Nadeem

University of Parma

Abstract

Since the last decade, the world economy has been transitioning towards digital transformation and sustainability. Both concepts have been viewed to solve the grand challenges, especially climate change. This study aims to explore the literature integrating digitalization and sustainability in top-ranked business journals. Drawn upon the appropriate dataset, findings show a tremendous increase in literature, specifically since 2018. Using the taxonomies, we observed prosperity (SDG7, SDG8, SDG9, SDG10, SDG11) is highly focused in literature, while scant research is available on *peace* and *partnership* of sustainable development goals (SDGs). Conversely, digital technologies are used for *sustainable development and SDGs*. Whereas digital devices such as *platforms and ecosystems, blockchain, big data and analytics* are widely applied to evaluate *prosperity* and *overall sustainability*. This study extends the existing literature by providing important directions for future research.

Keywords: Digital Transformation, Sustainability, Literature review, taxonomy development

Exploring the Antecedents of Skilled Workforce Voluntary Turnover within the Context of Migration Wave in Pakistan

Danyaal Bin Raza

University of Central Punjab, Lahore

Dr. Talha Zubair Ahmad Khan

University of Central Punjab, Lahore

Abstract

This study explores the antecedents of skilled professional voluntary organizational turnover within the context of recent migration wave in Pakistan, with a particular focus on higher education institutes (HEIs). Furthermore, this study aims to take a holistic approach towards identifying antecedents of organizational turnover.

The literature on faculty migration and turnover is reviewed and analyzed. Structured interviews were conducted with faculty members who had migrated from universities in Pakistan in order to explore reasons behind their migration decisions and associated experiences. Information collected from the interviews is analyzed to identify themes. Insights from the literature review are compared with themes identified from interview data to confirm or contradict existing knowledge about faculty turnover within the context of migration.

Thematic analysis revealed multifaceted yet interconnected factors that exist at individual, organizational, and environmental level of analysis. These factors represent myriad of reasons that lead towards faculty voluntary turnover and consequently migrate out of the country. Then the findings are discussed and analyzed through an adapted Bronfenbrenner's Ecological Systems Theory. This helped in determining whether or not the needs of the academics are being met, and what leads to the decision to leave the organization and migrate. Ultimately, the study informs policy makers and educational institutions on effective talent retention strategies, which can mitigate the negative effects of skilled labor turnover in the Pakistani higher education sector.

Keywords: Organizational Turnover, Pakistani HEIs, Migration Wave, Bronfenbrenner's Ecological Systems Theory, Brain Drain

Impact of Financial Literacy & Gender Preferences on Stock Market Participation with reference to Risk Attitude

Abstract

Indispensible basis of this paper is to develop framework through which we can manage the role of Financial Literacy (FL), Gender, risk attitude (RA) while making plans for stock market participation (SMP). Conceptual paper stated under tells how stock market participation (SMP) is affected by gender having different level of financial literacy (FL). This paper tells us basic financial literacy (BFL) plus advanced financial literacy (AFL) positively affects SMP. With reference to gender, females invest less in SMP. It also explains risk behavior towards monetary decisions. Whereas; the novelty of this paper is the considerable role of Risk Attitude (RA) with relation to the gender. The data survey was conducted in different public and private sector Universities in Lahore city. We have distributed 300 questionnaires among students and received 200 questionnaires with valid response which we have used for data analysis. This study can contribute in existing literature to understand the role of financial literacy and gander in stock market participation with reference to the impact of risk attitude.

Keywords: Stock market participation, Basic financial literacy, Advance financial literacy, Risk attitude, gender

**Exploring the Impact of Storytelling Involvement in Hospitality Marketing:
Mediating Roles of Perceived Authenticity, Well-Being and Customer
Engagement on Consumer Behavior, Revisit Intentions and Purchase
Decisions**

Areej Shoukat

Hailey College of Banking and Finance, PU

Eeman Shoukat

Hailey College of Commerce, PU

Muqadas Manzoor

Hailey College of Commerce, PU

Aniqa Sheraz

Hailey College of Commerce, PU

Noor Fatima

Hailey College of Banking and Finance, PU

Abstract

With the passage of time, marketing has reached beyond what services or products you sell. Now it is about what story you tell your customers. By determining how contextual cues, mental cognition, emotional engagement, and immersive experience influence behavioral and revisit intention and purchase decision of consumer within the hospitality industry through mediating role of perceived authenticity, well-being perception, and customer engagement affecting the storytelling-consumer behavior relationship. Additionally, brand loyalty and brand delight are analyzed as moderating variables that potentially enhance the storytelling involvement on consumer outcome is a subject of this study. This research also shed light in the context of Social Identity Theory, Self-Determination Theory, Signaling Theory and Attachment theory for understanding how storytelling involvement in hospitality marketing can lead to positive consumer behaviors. Undertaken in Pakistan, the data will be collected from 400 customers of top hospitability brands having storytelling-based culture such as Hotel One, Avari Towers, and Pearl Continental. The findings aim to bridge gaps in existing literature and offer practical insights for enhancing authenticity, well-being and consumer engagement through effective storytelling leading in positive behavior and intentions.

Keywords: Hospitality marketing, Storytelling, Consumer behavior, Revisit Intention, Perceived authenticity, Brand loyalty

Impact of Fintech Innovations on Traditional Banking Performance

Syed Zain Ul Abedeen

Hailey College Of Banking and Finance, Lahore
University Of the Punjab, Lahore

Abstract

The current work aims at scrutinizing how these developments have influenced the conventional banks regarding their market share, efficiency, and customer satisfactions, and alteration in the modes of transactions. Based on quantitative analysis with a rich set of variables, the paper offers a comparative evaluation of banking performance during the pre-fintech integration and post-fintech integration periods. In the same vein, the results suggest that integrated sample banks experience either a market share and profitability stabilization or improvement compared with their peers with low or negligible fintech integration, reporting declines in both areas. Moreover, an increase in customer satisfaction where digitally transformative banks have implemented has emphasized the centrality of the customer-orientation approach in the emerging fintech business environment. In this study, the author provides a body of knowledge on how change in a traditional banking system is being driven by fintech, which provides stakeholders with relevant material to deal with the impacts of change by technology within the financial sector. By emphasizing the importance of cost leadership over the long term, coupled with the notion of strategic innovation, the paper thus establishes continuity as a critical imperative for banks seeking to retain their competitive edge in a global financial environment that continues to transform at a dizzying place.

Keywords: New Technologies in Financial Services, Conventional Banking, Market Penetration, Profit Margin, Customer Satisfaction, Smart Banking, Financial Technology, Banking Efficiency Indicators, Competitive Edge, Technological Change

The Role of Corporate Governance in Mitigating Financial Fraud and Enhancing Fraud Detection

Muhammad Raza Zafar

Bahahuddin Zakariya University Multan

Muhammad Hasnain Ali

Bahahuddin Zakariya University Multan

Abstract

Corporate governance stands as an ethical course for organizations to follow to avoid any kind of financial fraud, and it also plays an important role as a safeguard. Though governance practices have progressed, financial fraud is still prevalent in many industries; this suggests that a particular governance mechanism might not be effective enough. This study investigates the importance of corporate governance in preventing and detecting financial fraud, including mechanisms such as the composition of the board, the effectiveness of the audit committee, internal controls, compensation to executives, and whistleblower policies. A mixed-methods approach was used, with quantitative data from secondary sources complemented by qualitative statements drawn from regression analysis of 200 publicly listed companies from across every sector and region. The results show that independent and diverse board compositions, strong audit committees, effective internal control systems, and ethically aligned executive compensation are all dramatically associated with fewer financial fraud occurrences. This study found fraud detection rates enhanced by whistleblower policies. Finally, the study demonstrates that industry-specific factors explain the effectiveness of governance mechanisms, while corporate culture and stakeholder engagement explain the mediation between governance in practice and fraud outcomes. The findings in this study reinforce that fraud risks will remain without comprehensive governance frameworks tailored to organizational and industry needs. Organizations can increase their resilience to financial misconduct by resolving governance gaps and building an accountable culture. These findings have policy and practice implications for practitioners and policymakers in designing effective governance for fraud prevention.

Keywords: Corporate governance, financial fraud, audit committees, internal controls, whistleblower policies, executive compensation, board composition, fraud detection, corporate culture, stakeholder engagement, mixed-methods

Investigating the impact of attitude homophily with influencers on e-entrepreneurial intentions among digital-native generations

Ayesha Noor Aslam

Hailey College of Banking and Finance, University of the Punjab Lahore, Pakistan

Dr. Muhammad Bilal Ahmad

Hailey College of Banking and Finance, University of the Punjab Lahore, Pakistan

Maryam Sohail

Government College University, Pakistan

Abstract

This study investigates the growing influence of social media influencers on e-entrepreneurial intentions (EEI) among millennial and generation z by measuring the impact of attitude homophily with influencers (AHI) through the mediating role of the Theory of Planned Behavior (TPB). As technological advancements evolve, it is crucial to understand the psychological and social factors that drive e-entrepreneurial intentions in these digital-native generations. The study hypothesized AHI as an independent variable that impacts EEI through the mediation of TPB factors: subjective norms (SN), perceived behavioral control (PBC), and attitude toward e-entrepreneurship (ATEE). Quantitative data was collected from 381 millennial and gen z social media users via online and paper-based survey by using convenience sampling technique. Structural equation modeling (SEM) in SmartPLS 4 was used to analyze the model. The results indicate that AHI, PBC, and ATEE have a significant impact on EEI, while the TPB constructs as mediators were insignificant. The findings suggest that sharing similar attitudes or values with social media influencers significantly inspire entrepreneurial intentions, particularly in the context of electronic-entrepreneurship. Additionally, this study contributes to the expanding literature on social media and entrepreneurship by shifting the focus from consumer behavior to entrepreneurial behavior. It also underscores the importance of influencer-driven support in fostering entrepreneurial aspirations among millennial and gen z. The findings offer practical implications for policymakers, educators, and industry leaders who aim to cultivate a digital ecosystem that nurtures e-entrepreneurship.

Keywords: attitude homophily with influencers; e-entrepreneurial intentions; theory of planned behavior; millennial; gen z; social media influencers; Pakistan

Exploring the Impact of Paradoxical Leadership on Employee Innovative Performance through Job Crafting and Job Autonomy

Muhammad Tasnim Khan

University of Management and Technology, Lahore, Pakistan

Abstract

This study investigates the direct impact of paradoxical leadership (PXL) on employee innovative performance (EIP), addressing the critical need for innovation in workplaces facing paradoxical challenges. To conceptualize this whole framework, the researcher applied paradox theory as underpinning. To explain this relationship, job crafting is introduced as a mediator, positing that employees actively redesign their roles to align with leadership expectations, fostering innovation. Additionally, the moderating role of job autonomy is examined, exploring its multiplier effects on two pathways: (1) the influence of PXL on job crafting when autonomy is high and (2) the impact of job crafting on EIP under conditions of elevated autonomy. Data was collected from 326 employees in ICT companies across four major cities in Pakistan. A sector was chosen due to its prevalence of paradoxical scenarios and the demand for autonomous, innovative problem-solving. The study employed a three-time lagged design to minimize common method bias (CMB) and social desirability effects. Constructs were measured using validated scales, and data was analyzed using PLS-SEM through R Studio (PLSPM and SEMINR packages). Findings reveal that PXL positively influences EIP, with job crafting as a significant mechanism explaining this relationship. Moreover, job autonomy strengthens both the PXL-job crafting and job crafting-EIP relationships, highlighting its critical role in fostering workplace innovation. These insights guide managers in promoting leadership styles and workplace designs that empower employees to adapt creatively to challenges. This research contributes to the leadership and innovation literature by offering a nuanced understanding of the interplay between paradoxical leadership, job crafting, and autonomy, presenting actionable recommendations for ICT sectors.

Keywords: Paradoxical Leadership, Paradox Theory, Employee Innovative Performance, ICT sector of Pakistan

Financial Determinants of Dividend Smoothing: An Empirical Evidence from Pakistan

Saadia Younis

Hailey College of Banking and Finance, University of the Punjab Lahore, Pakistan

Abstract

Dividend smoothing is an innovative financial practice wherein firms maintain stable and foreseeable dividend payouts despite variation in earnings, plays an important role in signaling financial stability and managing investor expectations. Though dividend smoothing has been extensively studied in developed economies, there is a lack of empirical research on its determinants in the context of emerging markets such as Pakistan. This study aims to explore the financial factors that influence dividend smoothing practices among firms listed on the Pakistan Stock Exchange (PSX). The analysis focuses on five major sectors—Commercial Banking, Power Generation and Distribution, Technology and Communication, Oil and Gas Exploration, and Cement comprising 73 companies over the period from 2010 to 2023. The study investigates the impact of key financial determinants such as profitability, leverage, industry payout norms, firm size, and firm age on dividend smoothing behavior. By employing quantitative analysis techniques, this research seeks to identify sector-specific patterns and provide insights into how these factors shape dividend policies in a developing country like Pakistan. The findings will contribute to the understanding of dividend behavior in emerging markets, offer guidance for corporate managers in formulating dividend policies, and assist investors in evaluating firms based on their dividend stability. This paper also highlights the potential implications for policymakers and future researchers exploring dividend practices in other sectors and regions.

Keywords: Dividend smoothing, financial determinants, Pakistan Stock Exchange, profitability; leverage, firm size, firm age, emerging markets and industry average payout comparisons.

Customer Satisfaction

Tehreem Javed
Muqadas Bibi

Abstract

This study shows the effect of service quality on custom satisfaction and more closely on trust and expectations. A quantitative method is employed , where data was collected from customer in different service industries to determine that established service quality and it's effect on customer satisfaction. The results make it clear that with the enhancement of service quality, customer satisfaction is improved and trust is verified as a mediating variable in this relationship. Thus implies that in order for the customers to be satisfied the customer must consider the service provider to be trust worthy. Furthermore, customers expectations offer a moderating interaction meaning that the relationship between the service quality and customer satisfaction is effected by the expectations determined by the customers.

How Dose Ramdan Affect Small Businesses in Pakistan

Abstract

This research is conducted in the field of Business Administration, the core area of the subject of Business Research. The research is done to find out the impact of Ramdan and the intensity of its impact on small businesses in Pakistan, where limited research was done before. The purpose of conducting this research is to examine how dose Ramdan, the fasting month for Muslims around the globe, affect the Business Performance and how dose it influence the Consumer Behaviours and Buying Patterns in Pakistan and Which type of business gets more affected, while taking Ramdan as an independent variable, Location and Business type as moderators and Business Performance, Consumer Behaviours and Buying patterns as dependent variables. This research primarily investigates small businesses in Lahore. The study employs a mix-methods approach, combining qualitative and quantitative research. The research design used to conduct this research was a survey. A sample of 250 small businesses was drawn from the whole population (Lahore). The data collection tool used in this research was a questionnaire. The collected data was analysed using the SPSS Software. The research interprets the findings using contingency theory that every business has its own management approach to tackle the impact Ramdan leaves on it, depending on factors like location, business type and size etc. The research concludes that Ramdan affects some businesses positively and leaves a repercussion on some others depending upon the type of the business. It influences the consumer behaviours and buying patterns to a great extent. Lastly, the study suggests that future researchers can use this study to carry out more researches in at least two ways; to find suitable marketing strategies for the small businesses to confront the shock left by Ramdan and to highlight some possible opportunities progressing businesses can take to advance their businesses to another level. Researchers can evaluate the same findings in the context of other cities of Pakistan.

Building a Strong Employer Brand Impact on Organizational Performance and Employee Engagement

Hira Zubair

Hailey college of Banking and Finance, University of the Punjab, Lahore

Maheen Ali

Hailey college of Banking and Finance, University of the Punjab, Lahore

Abstract

Employer branding is a term that highlights not only performance but better environment at a certain workplace. Building and maintaining a strong employer brand in the educational sector has become more important in both research as well in the practical aspect of organizations. For this research we explore how an employer relation with its employees can change the scenario of the whole organization in terms of their loyalty, in terms of their productive approach, as well their attention towards their workout. In this study, Employer Brand Strength is taken as the independent variable to assess its effect on Organizational Performance and Employee Engagement, which are the dependent variables. Additionally, Perceived Organizational Support and Organizational Culture are examined as moderating variables to understand their influence on these relationships.

For this purpose we get the sample of 250 employees of different educational organization from Lahore and find this study's practical implementation. The data is collected in the form of questionnaire and the answers were in the form of Likert scale from 1 to 5 in this regard as SPSS software is used for the analysis in the form of Tables Charts and Ratios Requirements.

This study finds that there is the lack of interdepartmental communication between effective practices of employees and employers as well as the corporate social responsibility not fully perform by employers during the job timings with employees. And another Finding Comes here about Training and Development also not present.

Here the practical implementation come into existence if the employers of the organization make a positive behavior as well as create an effective communication with their employees and fulfil their responsibilities in the form of their work life balance, workload management, training and development so the educational institutes performance can be on the top of the list among all the organizations. As well as it create positive impact to the society where we live because the association of every person with these organizations is very close and very common to all while they exist in any age life and related to every field of work.

Keywords: Employers Branding, Education Sector, Organizational Performance, Employee Engagement, Organizational Commitment, Employer Brand Loyalty, Employee Retention, Corporate Social Responsibility, Educational Management, Perceived Organizational Support.

The effectiveness of influencers in promoting brands

Abstract

This research examines the effectiveness of influencing in effective marketing in shaping consumer behaviour. Influencer Marketing has emerged as a pivotal digital marketing strategy. Leveraging the trust and reliability of social media influencers to influence purchasing decisions brand loyalty and employee engagement . the study explores critical factors such as influencers creditability , niche relevance and audience interaction and how these drive consumer responses.

Using the mix method , including survey case studies and social media engagement metrics the research assesses how influencer marketing influences purchase decisions.

The findings indicate that influencer marketing is most effective when the influencers personal value assigns with the brand and when there is transparency in disclosing the sponsorships . Campaign that feels authentic and provide genuine value to the audience tends to engage greater value and strong customer relationships.

Impact of employee turnover on business

Abstract

Employee turnover is a significant concern for businesses worldwide. It can lead to substantial costs, decreased productivity, and loss of intellectual capital. When employees leave a company, they take their skills, knowledge, and experience with them. This can be devastating for businesses, especially if the departing employees are high-performers or hold critical positions.

The costs associated with employee turnover are staggering. According to various estimates, the average cost of replacing an employee can range from 16% to 213% of the employee's annual salary. These costs include recruitment and training expenses, as well as the lost productivity and efficiency that result from the departure of experienced employees.

In addition to the financial costs, employee turnover can also have a significant impact on a company's productivity and efficiency. When employees leave, their responsibilities often fall to their colleagues, who may not have the necessary skills or experience to perform the tasks effectively. This can lead to decreased productivity, missed deadlines, and a decline in overall performance.

Furthermore, employee turnover can also result in the loss of intellectual capital. When experienced employees leave a company, they take their knowledge, skills, and expertise with them. This can be particularly devastating for companies that rely heavily on the expertise of their employees. This article looks at the impact of employee turnover on businesses and suggests ways to reduce its negative effects.

E-Commerce In Business

Sadia Iftikhar
Sania Abdul Sattar

Abstract

E-commerce enhance customer satisfaction and provide quality information about product on social media with customer's trust and loyalty. The whole commerce depends on excellent information and customer feedback that encourage business and provide ways of more sales revenue. Social business (s-trade) offers local area based stages that work with client to-client cooperation and the advancement of clients' social shopping-based insight. While earlier exploration plays tended to the part of client commitment (CE) in helping s-trade based deals and execution, knowledge into the impact of s-business credits on CE stays questionable. Tending to this hole, this study looks at the job of explicit s-business credits (for example local area, joint effort, intelligence and social elements) on CE, which is, thus, proposed to affect clients' repurchase-and electronic verbal goal. In short we concluded that more the better information and customer satisfaction more promotion of E-commerce in any type of business.

Exploring the Link Between Employee Collaboration and Job Performance

Abstract

This research delves into how employee collaboration influences job performance, examining how the frequency of collaboration, demographic characteristics, and leadership styles affect job satisfaction and performance assessments. A survey of 100 employees across various departments in a medium-sized organization was conducted. The results underscore the critical role of fostering collaborative work environments to boost employee performance and drive organizational success.

Keywords: Employee collaboration, job performance, teamwork, organizational behavior, leadership styles.

Challenges in effective utilization of customer feedback

Abstract

This research is conducted in the field of Business Administration, the core area of the research is marketing. The research is done to find out the challenges in effective utilization of customer feedback to retain customers in Pakistani market. The challenges that Pakistani businesses confront, such as a lack of resources and data analysis are addressed. This article investigates the significance of customer feedback and retention in the Pakistani market, emphasizing the need for firms to successfully use feedback to promote customer happiness and loyalty. The study employs quantitative research method. The data collection tool used in this research was a questionnaire A sample of 260 customers was drawn from the whole population (Lahore). The collected data was analysed using the SPSS Software. Descriptive and regression analysis were performed to interpret the data. Technological limitations and language diversity are independent variables that influence the customer retention rate, which is the dependent variable. Additionally, the employee training program serves as a moderating variable, while the effective utilization of customer feedback acts as a mediating variable. While considerable challenges exist, they can be met by strategic initiatives such as Multilingual Feedback Tools, Digital Literacy Programs, Technological Infrastructure, Data Security and supportive policies. Focusing on technical advancements and embracing linguistic variety will improve feedback procedures, resulting in increased customer retention and sustainable market growth. This research offers a complete guide for businesses to manage customer feedback in a rapidly changing technological landscape.

E-Commerce growth and challenges in 2024: The Role of Technological Advancement and Mediating Challenges

Abstract

We investigate the fundamental paradox of technological advancements functioning as both enablers for sustained e-commerce growth and challenges in mediating their effectiveness. Through this lens, we illuminate the impact these challenges have on innovation vs. sustainable growth and the dynamic between which of these two considerations wins out as we enter a revamped e-commerce landscape in 2024. A conceptual framework was created to examine the relationship between technological evolution (independent variable), issues (mediator), and e-commerce development (dependent variable). This study provides an overview of recent literature, reports and case studies findings. This is brought out well by the following technological developments, where AI, mobile commerce, and automation constitute some of the key influences to e-commerce. However, factors like supply chain risk which may result from outsourcing, cyber security attack risks, and the power of competitive market forces mediate this relationship to some extent to counter balance the benefits of technology. These are obstacles that have to be overcome in order to facilitate progress to go on. Secondary data is mainly used in the research, and using primary data sources may help overcome the problem of overlooking regional or company-specific peculiarities in the course of research. The future studies could employ the empirical data gathered to test findings. Theoretical underpinning of mediating role of challenges in this study will guide managing such challenges for P2P e-commerce to expand in future; while providing practical recommendations for business and policy makers to capitalise on growth and reduce risk.

Keywords: E-Commerce growth, Technological advancement, Supply chain challenges, cybersecurity, market competition, Artificial intelligence in e-commerce

The Impact of Human Resource Management (HRM) on Employee Satisfaction and Performance

Sadeeqa Batool

Hailey College of Banking and Finance, University of the Punjab, Pakistan.

Fatima Saeed

Hailey College of Banking and Finance, University of the Punjab, Pakistan.

Abstract

The purpose of this research is to investigate the impact of human resource management (HRM) strategies on employee satisfaction and efficiency. It aims to analyze how various HR practices—such as recruitment, training, rewards, and performance management— affect employees' contentment and productivity. Furthermore, the study seeks to understand the relationship between employee satisfaction and performance, identifying HR strategies that effectively enhance both. The research intends to provide insights and recommendations for organizations to optimize their HRM practices, improve workforce management, and achieve a competitive advantage. The findings indicate that effective human resource management (HRM) strategies have a significant impact on employee satisfaction and performance. HR practices such as comprehensive training programs, performance-based rewards, and clear communication channels are closely linked to higher levels of employee satisfaction. Moreover, satisfied employees tend to exhibit improved performance, which is evident in their better task performance, time management, and overall productivity. The study also highlights those inconsistencies in HR policies or a lack of alignment with employee needs can negatively affect both satisfaction and performance. This underscores the importance of strategically designed HRM practices in driving organizational success.

Keywords: Human Resource Management, Employee Satisfaction, Employee Performance, Organizational Effectiveness, Strategic HRM

**Exploring the role of training & development in enhancing
employee retention**

Maliha Anam

Hailey college of Banking and Finance, PU

Bisma Waris

Hailey college of Banking and Finance, PU

Abstract

Employee retention is a critical concern for organizations aiming to maintain a competitive edge as high turnover rates lead to increased recruitment costs and decreased productivity. This paper suggests a research methodology to explore the role of training and development in improving employee retention, focusing on the mediating role of job satisfaction and the moderating effect of career growth opportunities. Based on established theories and validated scales, the research will examine the relationships between these variables within medium-sized organizations. The paper also implies that by using data analysis technique such as regression analysis to analyse structured surveys to assess the impact of training programs on job satisfaction and retention, while analysing how career growth opportunities strengthen this relationship, the study will provide actionable insights for human resource practitioners to design more effective employee development strategies that foster long-term retention. By understanding the dynamics of training and development as an independent variable, job satisfaction as a mediator and career growth opportunities as a moderator, organizations can optimize their training initiatives to enhance employee engagement and reduce turnover.

Circular Business Model: The Role Anthropomorphism in Second Hand Fashion Retail

Abstract

This study expects to investigate what humanoid attribution means for the versatility of roundabout plans of action (CBMs) in recycled style retail, zeroing in on customer commitment and the change from specialty to standard reception. The exploration inspects how humanoid attribution upgrades close to home commitment and works with methodologies for scaling CBMs. A reasonable model is fostered that recognizes the job of humanoid attribution at the item, brand, and stage levels in driving purchaser reception. The review proposes profound commitment as a middle person and purchaser demeanor toward manageability as a mediator in the connection among humanoid attribution and stage reception. Human plan procedures, like human-like stories for items, compassionate brand personas, and intuitive stage highlights, essentially improve profound commitment, encouraging trust and lessening the shame related with recycled products. Besides, shopper demeanor toward maintainability enhances the impact of humanoid attribution on reception and commitment. This double impact of profound commitment and supportability mindfulness speeds up the progress of recycled style from specialty to standard utilization, supporting both broadness and profundity scaling systems in CBMs. This examination adds to the writing on scaling CBMs by incorporating humanoid attribution as an original driver of customer commitment. By consolidating human techniques with process-based scaling draws near, the review offers bits of knowledge into how recycled style retailers can accomplish authoritative development (broadness scaling) while at the same time affecting far reaching pursues and routines (profundity scaling), subsequently propelling the roundabout economy.

Keywords: Anthropomorphism, Circular business model, Second-hand fashion, Consumer engagement, Sustainability

An exploratory study of intersection of FinTech, AI(Artificial Intelligence) and Green Finance: A cooperative approach

Maidah Tahir Butt

Hailey College of Banking and Finance, Punjab University.

Wishah Rashid

Hailey College of Banking and Finance, Punjab University.

Abstract

The purpose of this paper is to investigate the dynamic between FinTech, Green Financing and Artificial Intelligence. It explains how FinTech can assist green financing by increasing the capital, reducing the costs and helping to identify and manage risk. It also explains how Artificial Intelligence can help in the improvement of FinTech and Green Financing. This study examines the role of technology in developing a sustainable environment. Methods such as in-depth analysis of different cases are used, data can be collected by using both the quantitative and qualitative research methods to gain a more comprehensive understanding of the topic. Data can be collected through various surveys, interviews etc. to understand the perceptions, attitudes and behaviours.

- 1 .A wide range of green investment opportunities are provided access via FinTech platform.
2. AI is used to optimize operations and reduce cost.
3. International collaborations are made in order to increase knowledge and understandings.
4. New financial instruments are introduced to green projects for sustainable business opportunities.

Keywords: FinTech, Financial Technology, Green Financing, Sustainable Finance, Artificial Intelligence, Decision Making.

The impact of Artificial Intelligence on Business Performance: Examining the role of Artificial Intelligence on Business Performance, mediating role of Organizational resilience and moderating role of Big Data Analytics.

Abstract

Artificial intelligence (AI) applications are becoming more common as a result of technological advancements. Studies on the use of artificial intelligence (AI) in corporate settings have focused on the potential and uses of AI while accounting for employees' desire to use AI apps and their big data analytical competence. The objective of this study is to find out that how AI impacts the Business performance? The research is based on primary data analysis, quantitative approach and cross-sectional study. Measurement Model Analysis, Structural Equation Model, and Descriptive Statistics methods will be used. Data will be collected through questionnaires, surveys and interviews. Adoption of AI and Big Data will be anticipated to improve efficiency and decision-making, which will have a positive effect on corporate performance. This influence will be mediated by organizational resilience, allowing businesses to more effectively integrate and leverage AI's promise. Big Data Analytics will increase AI's influence even more, and businesses with strong BDA capabilities will see higher performance improvements.

Keywords: BDA, AI, Resilience, RBV, DC Theory and Business Performance.

Strategic Governance: How Corporate Oversight Drives Social Responsibility Initiatives

Alishba Jameel

University of Management and Technology (UMT)

Dua Batool Khan

University of Management and Technology (UMT)

Dr. Muhammad Gulzar

University of Management and Technology (UMT)

Abstract

The vital aim of the study was to find how attributes of corporate governance empirically affect Corporate Social Responsibility. This study investigated the associations between CG characteristics and CSR. The current study uses a sample of 55 five listed non-financial companies on the Pakistan Stock Exchange (PSX), from the year 2019–2023, Quantitative method is being implemented to analyze the data. CSR spending is used to find the relationship between CG and CSR and its combined impact on a firm's performance.

The finding reveals that CSR performance positively correlates with board size, the number of women directors, institutional ownership, and firm size. In contrast, Return on Equity (ROE) in terms of profitability shows that strong CG mechanisms can better promote moral behaviour, improve transparency, and maximize shareholder wealth. The current Study highlights how entities with strong CG frameworks can better maintain morality and openness. Moreover implementation of strong CG standards not only increases shareholder wealth but also shows that they are committed to ethical business operations. This transparency and adherence to moral principles make it easier to incorporate CSR into their operating framework.

Board Characteristics and Audit Quality with The Moderating Role of Gender Diversity

Dr. Muhammad Gulzar

University of Management and Technology (UMT)

Dua Batool Khan

University of Management and Technology (UMT)

Alishba Jameel

University of Management and Technology (UMT)

Abstract

This study aims to find the effect of board characteristics on audit quality and the moderating role of female directors in achieving high audit quality of listed companies in the Karachi Stock Exchange 100

(KSE 100). Correlation matrix and GMM regression have been used. 70 listed non-financial companies were chosen from 2019-2023 this study's audit quality is the dependent variable. Board independence, female directors and board size are independent variables. Firm size and auditor fee are control variables.

The findings show that board characteristics affect audit quality with a moderating role of gender diversity. this study has used secondary data. All of the information has been taken from published annual reports. The finding of this research is female directors on the board should be encouraged, female directors should be given a good environment.

The Impact of Family ownership on Dividend policy and Board Independence in moderating role of CEO compensation

Dr. Muhammad Gulzar

University of Management and Technology (UMT)

Nimra Dildar

University of Management and Technology (UMT)

Rameen Sibghat

University of Management and Technology (UMT)

Abstract

The purpose of the study is to examine the impact of family ownership on the Board of Independence and dividend policy with the moderating effect of CEO compensation studied in the context of Pakistan. The sample consists of 50 listed nonfinancial firms listed in KSE 100. The period was 2016 -2023. The GMM regression was applied to estimate the results as the data consists of a dynamic panel setting. The results indicate that dividend policy negatively impacted the FOWN they roll out fewer dividends and retain their earnings for future investments. COMP has a positive effect on BOI they probably suggest performance-based pay for the expenses but in the family-owned company, it becomes negative because often families pay equity-based incentives then increasing the base pay or offering any extra incentive which was consistent with our dividend model there the result of COMP increase. The control variables such as prof, firm age, and leverage showed positive effects with independence of the board, and with dividend age and leverage showed negative results prof being positive the rationale behind that independent members are not involved in any conflict of interest so they increase prof mature firm often have more independent members and lev is preferable to get benefit out of tax shield whereas the more mature firm do not roll more dividend and if have already more leverage in their portfolio roll out less dividend and profitability increase the rate of dividend payments.

The influence of Independent Boards on the relationship between audit quality and earnings Management

Dr. Muhammad Gulzar

University of Management and Technology (UMT)

Rameen Sibghat

University of Management and Technology (UMT)

Nimra Dildar

University of Management and Technology (UMT)

Abstract

The purpose of this paper to investigate the impact of Audit quality with earning management with moderating role of board independence. The data consists of non-financial 50 listed companies of KSE 100. The data is quantitative and secondary annual reports are used for data collection. GMM regression technique is used to find out the results as fixed and random effect don't show significant results. The results here indicate that AUDSIZ is sig with earning management if AUDSIZ increase then EM decrease respectively The big4 audited firms are less into earning management practices because of their strong internal control. And FSIZE, FAGE are also significant if FSIZ increase then EM will also increase and FAGE will decrease the EM vice versa. The size variable usually influence EM because of agency conflict. The mature firms don't involve themselves with EM because of their image in the industry. This study didn't find any sig relationship of board independence which need to farther investigation

Assessing the Strategic Impact of CSR Initiatives on Corporate Profitability

Dr. Muhammad Gulzar

University of Management and Technology (UMT)

Neha Hussain

University of Management and Technology (UMT)

Fatima Jamal

University of Management and Technology (UMT)

Abstract

Examining the impact of CSR on firm's performance, within industries due to limited sector specific research and mixed global findings. Addressing the need of focused analysis, to build existing gap between CSR and firm performance. Revealing the impact of CSR on ROE, ROA and ROS. Positive and significant relation of CSR and ROS, unsettled relation observed wit ROE, and ROA. Suggests the stressing need for sector-specific CSR strategies.

Keywords: Corporate Social Responsibility, Firm performance, (PSX) 100 index, ROA, ROE, and ROS.

The Influence of Attributes of Corporate Governance on Financial Reporting Quality: Evidence from Pakistan

Dr. Muhammad Gulzar

University of Management and Technology (UMT)

Umair Ali

University of Management and Technology (UMT)

Dr Buhan Rasheed

University of Management and Technology (UMT)

Abstract

This study tries to examine the influence of attributes of Corporate Governance (CG) on Financial Reporting Quality (FRQ). The role of attributes of CG is as important as the quality reporting and this phenomenon is also getting more importance since the implementation of the code of CG. The sample consists of 49 non-financial firms from the KSE-100 index, all of these firms are listed on the Pakistan Stock Exchange (PSX) and the study period of this research is 2017-2022. In this study dependent variable is FRQ while the Board Size (BSIZE), Female Directors (FDIR), Board Gender Diversity (BGD), and Board Independence (BIND) are independent variables. To measure the FRQ modified Jones model is used. This study uses secondary data and all the data is taken from annual reports and the State Bank of Pakistan. The result shows that BSIZE, FDIR, BGD and BIND have insignificant relationships with FRQ.

From Foundation to Innovation: Predicting the impact of CEO attributes on firm innovation.

Dr. Muhammad Gulzar

University of Management and Technology (UMT)

Esha Nisar

University of Management and Technology (UMT)

Abstract

The main objective of the present study is to test the influence of CEO attributes on firm innovation. Firm innovation is proxied by CSR expenses and intangible assets and CEO attributes include age, tenure, education, experience, and remuneration. A sample of 58 firms from major contributing sectors are selected from the period of 2018 to 2023 making a total of 348 firm-year observations. Data technique used in the study is dynamic panel regression on STATA. Results of hypotheses testing revealed that the CEO attributes have a significant effect on the innovation of companies. With the increase in CEO tenure, education, experience, and remuneration, the firms will be more innovative which will lead to better performance. In addition to that, the results also reveal that younger CEOs with non-financial education will have a positive impact on firms' innovation. The study's findings will encourage the management of manufacturing sectors to allocate more funds towards intangible assets and foster CSR initiatives as a means of extending the company value and innovativeness. The study implications are for both researchers and practitioners in facilitating firms achieve sustainable development through innovative activities.

Assessing How Audit Committee Features Affect the Integrity of Financial Reporting

Dr. Muhammad Gulzar

University of Management and Technology (UMT)

Laiba Hassan

University of Management and Technology (UMT)

Esha Nisar

University of Management and Technology (UMT)

Abstract

The underlying objective of the present study is to examine the influence of audit committee (AC) characteristics on financial reporting quality (FRQ) via discretionary accruals. The data sample consists of 50 non-financial listed companies from the KSE-100 index on PSX from 2017 to 2022 making it 300 firm-year observations. For data analysis, the FGLS technique is used. Results of hypotheses testing revealed that the ACSIZE, ACIND, and ACFINEXP have a positive and significant relationship with FRQ. Through the results of this study, the significance of Quality reporting and governance proves to be an integral part of the policymakers, non-financial companies, regulatory bodies, and stakeholders in the future.

The Role of CSR Spending in Enhancing Firm Performance: Insights from the Pakistan Stock Exchange

Dr. Muhammad Gulzar

University of Management and Technology (UMT)

Rafay Ahmad

University of Management and Technology (UMT)

Dr Burhan Rasheed

University of Management and Technology (UMT)

Abstract

CSR activities that consider the well-being of stakeholders which attract the research and law representatives towards CSR (Velte, 2022). This study examine the nexus between CSR spending, ROA and ROE. The secondary data of KSE 100 index for the time being from 2017 to 2022 is used for the study. The researcher selected KSE 100 index because these top companies have almost 85% share in Market capitalization in Pakistan The result reflects corporate social responsibility have insignificant relation with ROA and ROE which mean that increase in CSR expenditure will cause of decrease in return on assets and vice versa.

There are only few studies which study the impact of CSR on performance of developing countries. The core purpose of this study to analysis the impact of corporate social responsibility on firm performance. In prior literature explained that CSR had positive and significant influence on Firm performance. However, the result of this study shows negative and insignificant which is due to Family ownership businesses, concentration of ownership and Government Rules and regulations

Examining the Influence of Audit Committee Characteristics on CSR Disclosure: The Moderating Effect of Audit Quality

Dr. Muhammad Gulzar

University of Management and Technology (UMT)

Asad Anjum Mirza

University of Management and Technology (UMT)

Dr Amer Shakeel

University of Management and Technology (UMT)

Abstract

The purpose of this study is to investigate the effect of board and audit committee characteristics on corporate social responsibility (CSR) in Iranian companies listed in stock exchanges. This is a descriptive-correlational and applied research. The statistical population of this research is all companies listed in Tehran Stock Exchange and the research period is from 2012 to 2018. Using screening method a sample of 150 companies was selected. Multivariate regression and the software Eviews 10 were used for data analysis and hypothesis testing. The results indicated that board size had a significant effect on CSR; board independence had a significant effect on CSR; managerial ownership did not have a significant effect on CSR; CEO duality did not have a significant effect on CSR; audit committee size had a significant effect on CSR; audit committee independence had a significant effect on CSR; and financial expertise of audit committee members had a significant effect on CSR. The present study is the first research performed on the effect of board and audit committee characteristics on CSR in Iran. The results of this study contribute to the literature on the effect of board and audit committee characteristics on CSR and provide suggestions for capital market participants. CSR helps reduce asymmetric distribution of information among the internal and external organizational entities and reduce agency problems and conflicts among different groups. Based on the results, an effective audit committee as an effective mechanism enhances the credibility of financial and non-financial reporting such as social responsibility, which means that an effective audit committee can improve the level of voluntary disclosure of information through effective oversight of the reporting process. It is also suggested that companies focus on audit committee characteristics to increase the level of CSR.

Examining the Characteristics of Audit Committee on Firm Performance with Ownership Concentration as a Moderator

Dr. Muhammad Gulzar

University of Management and Technology (UMT)

Amna Murtaza

University of Management and Technology (UMT)

Rafay Ahmad

University of Management and Technology (UMT)

Abstract

The theoretical base for the paper is to investigate the impact of Audit committee characteristics (ACs) on Firm performance measured by ROA. Characteristics of Audit Committee include Size, Independence, and Meeting frequency. Results entailed that Ownership concentration moderates the relationship. The sample for the study is 50 companies listed on the Stock Exchange of Pakistan from 2017 to 2022. Results entailed that Audit committee Independence (ACs-IND) and Meeting frequencies (ACs-MF) are negatively but significantly associated with ROA. The major reason is Pandemic disease affected all the world's firms, and that's why the results are unfavorable. Ownership concentration moderates the relationship between ACs and FP. The data technique used in the study is dynamic panel regression on STATA.

Analyzing the Influence of Working Capital Management on the Financial Performance of Selected Chemical and Pharmaceutical Firms in Pakistan

Dr. Muhammad Gulzar

University of Management and Technology (UMT)

Minahil Fayyaz

University of Management and Technology (UMT)

Dua Batool Khan

University of Management and Technology (UMT)

Abstract

The purpose of this study is to find the relationship between working capital management and financial performance of chosen chemical, chemical products and pharmaceutical companies listed is KSE. Correlation matrix, multiple regression, and secondary data have been used. 40 listed non-financial companies were chosen for the period 2017-2021. In this research, ROA and ROE are used to measure profitability. QR, CR, and CCC are used to measure WCM. This study has found a positive relationship between WCM and profitability because all the variables related to WCM show a positive relationship with the profitability of chemical, chemical products, and pharmaceutical companies in Pakistan. This study has used secondary data. All the information has been taken from annual reports presented in the Karachi Stock Exchange. The findings of this research is that the profitability of a firm can be increased by keeping the cash conversion cycle at an optimum level.

Impact of audit committee characteristics on financial reporting quality with the moderating affect of audit quality in the context of Pakistan

Dr. Muhammad Gulzar

University of Management and Technology (UMT)

Affifa Saleem

University of Management and Technology (UMT)

Laibah Hassan

University of Management and Technology (UMT)

Abstract

The underlying objective of the present study is to examine the influence of audit committee (AC) characteristics on financial reporting quality (FRQ) via discretionary accruals with the moderating role of audit quality. The data sample consists of 58 non-financial listed companies from the KSE-100 index on PSX from 2017 to 2022 making it 348 firm-year observations. For data analysis, the Random effect regression technique is used. Results of hypotheses testing revealed that the ACSIZE have a positive and significant relationship with FRQ and audit quality positively moderates the relationship of ACIND and ACSIZE with FRQ. Through the results of this study, the significance of Quality reporting and governance proves to be an integral part of the policymakers, non-financial companies, regulatory bodies, and stakeholders in the future.

Exploring the Strategic Role of Corporate Social Responsibility in Enhancing Firm Performance: Evidence from Pakistan

Dr. Muhammad Gulzar

University of Management and Technology (UMT)

Zara Aslam

University of Management and Technology (UMT)

Alsihba Jameel

University of Management and Technology (UMT)

Abstract

This study intends to identify the relationship between Firm Performance (FP) and Corporate Social Responsibility (CSR) practices in Pakistan. As the environment of this country is opportunistic, most businesses do not want to spend for the cause of CSR, they are interested in profits only. So there is a need for a study to fill this gap and promote the firms toward CSR. This study uses a sample dataset made up of 50 companies that are listed on the KSE-100 index. The dependent variable FP is measured with two different types of proxies one is Return on Equity (ROE) and the other is Return on Assets (ROA). CSR is the independent variable of the study which is measured with the CSR spending-to-sales ratio. Based on the results of the Hausman test this study uses a fixed effect panel regression estimate to test the hypotheses. The results show that CSR has a positive but insignificant impact on ROA while it has a positive and significant relation with ROE. This study suggests that taking part in CSR activities not only improves a company's profitability but also increases the shareholders wealth.

Examining the impact of working capital management on firm value, mediated by institutional ownership

Umair Ilyas

University of Management and Technology (UMT)

Nimra Dildar

University of Management and Technology (UMT)

Dr. Muhammad Gulzar

University of Management and Technology (UMT)

Abstract

The purpose of the paper is to investigate the relationship between working capital management and firm value moderated by an institutional ownership study from Pakistan. The sample consists of 50 nonfinancial firms listed in KSE 100. The study is quantitative and uses secondary sources for data collection which are the annual financial positions of the firms and the SBP site. The year was 2016-2022. A strongly balanced panel was created and random effect regression was applied to compute the results. The APP and IP were statistically significant and negative which means if these two were decreased at the optimum level the firm value would be increased. As these two are proxies for the WCM so this means if the managers efficiently manage the WCM and don't get involved in agency problems then the firm value will be flourished. Also for the control variables LEV and SIZE showed significant and negative results which means if the size of the firm is less and their capital structure lev isn't that much then the value of that firm will be better than the others that could be because smaller firms roll out their dividend from time to time and more lev for the firm could create issue of agency costs respectively. Also, this study didn't find any significant relationship moderating the relationship between WCM and firm value

**Green Banking activities and Environmental Performance of the Banks in
Pakistan: The Moderating Effect of Green Finance**

Javeed Iqbal

University of Management and Technology (UMT)

Laibah Hassan

University of Management and Technology (UMT)

Dr. Muhammad Gulzar

University of Management and Technology (UMT)

Abstract

This research emphasis to explore the green banking activities impacts on the commercial banks environmental performance and to identify the moderating effect of green finance sources to strengthening the relationship between Green Banking Activities and Environmental Performance of Banks operating in Punjab province of Pakistan. Convenience sampling method is used to received response form the respondent. Structured Questionnaires are employed to collect primary data from the employees of the banks and 175 responses were recorded as sample size. Structural Equation Modelling in smart PLS4 was employed to examine the relationship among dependent, independent and moderator variable. The outcomes of this research discovered that GBA has a significant impact on BEP but the Sources of Green Finance (SGF) do not moderate the relationship between GBA and BEP. After that practical implications, limitation and future directions of this research are discussed.

A study of relationship between growth of Islamic Banks and Conventional Banks in Pakistan with mediating effect of Bank Size

Dr. Muhammad Gulzar

University of Management and Technology (UMT)

Muhammad Islam

ACMA

Dr Muhammad Gulzar

University of Management and Technology (UMT)

Abstract

The study is conducted to investigate the consequence of the growing prevalence of Islamic banking on the financing instruments of conventional banks in Pakistan. The study discovers how the dynamics between conventional and Islamic banking sectors have grown, mainly focusing on the competitive and harmonizing relations that form the financial landscape. Using a multi-faceted method including theoretical analysis, observed data, and wide-ranging literature review, this research intends to offer a nuanced understanding of the effects and inferences of these changes on credit access, financial solidity, and overall economic growth in Pakistan.

This study is important as it addresses a serious gap in the understanding of how Islamic finance is reforming the traditional banking landscape in Pakistan. By providing empirical evidence on the growth of Islamic banks on conventional banks, the research will inform representatives, banking professionals, and academics about the developing dynamics of the financial sector. It will also offer strategic understandings for conventional banks to acclimate and boom in a progressively viable environment. Furthermore, understanding these effects will help in articulating policies that balance the development of Islamic finance with the steadiness and competitiveness of the overall banking sector in Pakistan.

The Impact of Social Media Usage on Mental Health Outcomes in Young Adults

Nousher Chohan

Hailey college of Banking and Finance, PU

Daniyal Saeed

Hailey college of Banking and Finance, PU

Abstract

This research paper investigates the intricate relationship between social media usage and mental health outcomes among young adults aged 18 to 30. Utilizing a mixed-methods approach, the study encompasses quantitative surveys and qualitative interviews to provide a comprehensive analysis of how social media impacts mental health. Key findings reveal a significant correlation between high social media usage and increased levels of anxiety and depression. Moderating factors, such as age, gender, and socioeconomic status, were found to influence these outcomes, while mediating factors, including social support, coping strategies, and self-esteem, played crucial roles in this dynamic. The paper concludes by emphasizing the need for balanced social media engagement and offers implications for mental health practitioners and future research directions.

How HR practices improve organizational culture

Prof. Bilal Ahmed

Hailey College of Banking and Finance, PU

Noor Bakiat

Hailey College of Banking and Finance, PU

Sundas Aslam

Hailey College of Banking and Finance, PU

Abstract

The primary aim of this study is to analyze the interrelated patterns of Human Resource Management (HRM) practices and employee motivation with job satisfaction and organizational performance. In particular, it attempts to determine how HRM practices relate to employee motivation and job satisfaction and how both affect organizational performance. The study follows a quantitative research design, with the use of surveys and questionnaires from diverse industries. Statistical techniques, including correlation and regression analysis, will be used in assessing whether certain relationships hold between the variables, namely HRM, motivation, job satisfaction, and organizational performance. The results of the study indicate that HRM practices directed toward the development, recognition, and well-being of employees positively impact employee motivation and job satisfaction. Additionally, it shows that motivated and satisfied employees relate more strongly to higher levels of organizational performance, clearly defining a pathway for HRM practices to outcomes in organizations. The study has practical implications for HR practitioners and organizational leaders in general. It underlines the need for HRM practices that motivate employees and consequently increase their job satisfaction. Organizations that implement HRM practices strategically, aligned with the needs of the employees, tend to have improvements in productivity, engagement, and overall performance. This research adds value to the existing literature by providing an integrated model which links the practices of HRM in relation to employee motivation, job satisfaction, and organizational performance. It offers a comprehensive framework to understand dynamic relationships between these kinds of variables and provides ground for future research in this field.

Keywords: HRM, employee motivation, job satisfaction, organizational performance, HRM practices, employee engagement, performance outcomes, workforce development.

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Dr. Muhammad Bilal Ahmed

Hailey college of banking and finance, PU

Adil Arshad

Hailey college of banking and finance, PU

Mehbub ur Rehman

Hailey college of banking and finance, PU

Abstract

Agriculture is considered to be an important sector of Pakistan's economy. This paper Based on past studies and recent developments tries to unearth the major factors affecting low agricultural yield, becoming an existential threat to the country's ailing agrarian economy. Time series data technique is being employed using various Governmental and private surveys and reports. The agricultural sector consisting of Major and minor cash crops is faced with numerous challenges like; effective water, seed, soil, environmental, and infrastructural management. The results depict that these factors are directly influencing agricultural productivity in Pakistan. Thus, lowering the agricultural yield across the larger swathes of the country.

Understanding the Influence of Customer Psychology on Buying Decisions

Muhammad Usman
Eman Pervaiz

Abstract

Customer psychology is a critical domain in understanding the factors influencing consumer decision-making. This research explores the psychological principles that govern buying behaviour, focusing on individual cognitive processes, emotional influences, and social dynamics. The study examines contemporary literature to provide insights into how businesses can strategically utilize these psychological factors to optimize marketing and improve consumer experiences. A mixed-methods approach is employed, combining qualitative analysis of existing studies and quantitative exploration of case examples.

Factors Influencing Consumer trust in e-commerce

Abstract

Core area of the research is marketing. This research is done to find out the impact of trust of consumers while making online transactions in e-commerce in The Pakistan, where limited research was done before. The purpose of this research is to examine how does lack of trust affects the online transactions and how it influences the business patterns in Pakistan. It is primarily investigates small businesses in Lahore. This study is based on quantitative approach. A quantitative data is gathered through a survey of sample of average 300 online consumers were drawn from the whole population (in Lahore), from which mostly are between 18 to 25 years of age. The data collection tool used in this research was a questionnaire. In this questionnaire we analyzed the factors such as less satisfaction levels, security concerns, transaction failures, inconvenience, etc. The data collected was analyzed in using the SPSS software. They used to adopt some precautions like update their passwords every 30 days, use biometric authentications, check for a valid certificate of authority, data encryption, etc.

We also concluded that in today's era of digitalization, despite its benefits and ease it also brings some challenges in establishing and maintaining customer trust. The importance of trust in online transactions has underscored due to the rapid growth in e-commerce. This study aims to provide a comprehensive overview of these challenges and suggest actionable measures or strategies to mitigate risks and improve online transactions landscape. It will then further contribute to the development of more secure and user friendly platforms, fostering consumer confidence and promoting market growth.

Lastly, the study suggests that future researchers can use this study to carry out more researches in at least two ways; to find out how if this problem will overcome can promote the economic growth, and also for businesses to highlight some possible opportunities that how they can progress and advance their businesses at another level.

Impact of social media and Smartphone Usage on the students

Dr. Muhammad Bilal Ahmad

Hailey College Of Banking and Finance, PU

Abdullah Hamid

Hailey College Of Banking and Finance, PU

Ahmad Fida Hussain

Hailey College Of Banking and Finance, PU

Abstract

The impact of social media and smartphones on the study habits of college students is crucial to developing a future-proof education system. Increasingly, the influence of social media is a vital and compelling component in the development of environmentally responsible educational practices with the proliferation of social media and how is altering the traditional classroom experience, the globe has shrunk to the size of a global village. This innovative research is one of the few to specifically examine the connection between the pros and cons of social media and the way college students think and learn, which is important for the long-term health of the field of sustainable higher education. Yet, the purpose of this research is to investigate the positive and negative influences on students' thoughts and how these have encouraged them to discuss both their experiences and perspectives with others. The ramifications of social networking sites and their applications on students' psychological adjustment or learning habits are not fully known, but they are becoming more obvious as they provide significant advantages for and threats to university students.

Immersive Retailing: Exploring the Impact of Virtual Reality on Customer Experience and Brand Loyalty

Dr. Bilal Ahmed

Hailey college of banking and Finance, PU

Umar Abdullah

Hailey College Of Banking and Finance, PU

Muhammad Yasir

Hailey College Of Banking and Finance, PU

Abstract

The retail industry is undergoing a significant transformation, driven by advances in technology and changing consumer behaviors. Virtual reality (VR) has emerged as a promising tool for retailers to create immersive and engaging customer experiences. This study investigates the impact of VR on customer experience and brand loyalty in the retail industry. A mixed-methods approach was employed, combining survey data from 500 retail customers with in-depth interviews with 20 retail executives. The results show that VR experiences significantly enhance customer satisfaction, emotional engagement, and brand loyalty. Furthermore, the study identifies key factors that influence the effectiveness of VR in retail, including the level of immersion, interactivity, and storytelling. The findings have important implications for retailers seeking to leverage VR to create memorable and loyalty-driving customer experiences.

An Analysis of the impact of Globalization on the business operations.

Dr. Muhammad Bilal Ahmad

Hailey college of banking and finance, PU

Amna Mahid

Hailey College Of Banking and Finance, PU

Ayesha Tariq

Hailey College Of Banking and Finance, PU

Abstract

This study examines the impact of globalization on business operations, exploring the opportunities and challenges that arise from increase global interconnectedness. Through a mix method approach, this search investigates the effects of globalization on business strategy, supply chain management, human resources, financial performances. The findings reveal that globalization has both positive and negative impact on business operations, including increase market access, improved efficiency and enhance innovations, but also greater competition, culture and regulatory complexities and logistical challenges. This research provides valuable insights for business seeking to navigate the complexities of globalization and capitalize on these opportunities.

ESG Unveiled: Enhancing Financial Performance in Investment Portfolios

Dr. Muhammad Bilal Ahmad

Hailey College Of Banking and Finance, PU

Fatima Rashid

Hailey College Of Banking and Finance, PU

Kanwal Safdar

Hailey College Of Banking and Finance, PU

Abstract

This comprehensive study delves into the intricate interplay between Environmental, Social, and Governance (ESG) factors and the financial performance of investment portfolios. Informed by an extensive literature review spanning from the 1970s to recent 2023 findings, the research sheds light on a prevailing positive association between ESG considerations and portfolio returns.

The significance of sustainable investment practices is underscored by the consistent trend identified in the literature, showcasing portfolios with robust ESG strategies yielding enhanced financial returns. Despite this, there exists a need for a nuanced understanding of the mediating impact of Corporate Social Responsibility (CSR) policies and the moderating influence of investor behavior on the relationship between ESG and portfolio performance.

This study introduces three hypotheses. The first hypothesis posits a positive relationship between ESG factors and the financial performance of portfolios, corroborated by literature emphasizing the potential for sustainable investment practices to yield positive outcomes. The second hypothesis explores the mediating impact of CSR policies, showcasing their role in further enhancing the positive influence of ESG, especially during crises and in developed economies. The third hypothesis delves into the moderating impact of investor behavior, underlining the significance of tailored strategies aligning with investor preferences.

Anticipated results, grounded in a mixed-methods approach and a pragmatism paradigm, suggest a positive correlation between ESG factors and financial performance. This is reinforced by the mediating role of CSR policies and the moderating influence of investor behavior. These findings contribute to the evolving landscape of sustainable investment practices, offering valuable insights for both socially responsible and traditional investors, and guiding decision-makers toward aligning financial goals with broader environmental and social objectives.

Business growth and its impact

Dr. Muhammad Bilal Ahmed

Hailey college of banking and finance, PU

Abstract

Main and most important purpose of business is maximizing the profit without profit a business can't run long term Maximization of profit, which is a goal for many companies to maintain long-term growth and survival, is typically achieved by increasing revenue and reducing costs. Without customer a business is nothing and can't survive. Customer is king so to satisfied the customer lead to business success Customer satisfaction is a term frequently used in marketing to evaluate customer experience. It is a measure of how products and services supplied by a company meet or surpass customer expectation. Expansion is a phase of the business cycle characterized by increasing economic activity, rising incomes, and growing consumer spending and investment. During an expansion, real GDP, employment, and corporate profits typically increase, while unemployment rates tend to decline. In a business context, innovation is the ability to conceive, develop, deliver, and scale new products, services, processes, and business models for customers Successful innovation delivers net new growth that is substantial. The analysis is based on firm-level data collected through a survey questionnaire in April-July 2004. The paper uses principal components analysis and a regression model to explain the factors that determine the pace of business growth

The Impact of Brand Ownership on Customer Engagement Behavior: The Mediating Role of Customer Brand Identification and the Moderating Influence of Cultural Values Orientation

Dr. Muhammad Bilal Ahmed

Hailey College Of Banking and Finance, PU

Minahil Shakeel

Hailey College Of Banking and Finance, PU

Nimra

Hailey College Of Banking and Finance, PU

Abstract

This study investigates the intricate relationships between brand ownership, customer engagement behavior (CEB), cultural values orientation (CVO), and customer brand identification (CBI) within the context of modern branding strategies. Brand ownership, which captures customers' emotional and psychological attachment to a brand, is hypothesized to positively influence engagement behaviour's such as advocacy, loyalty, and feedback. However, the pathway from brand ownership to CEB may be moderated by cultural values and mediated by customer brand identification. Specifically, the study explores how cultural orientation—particularly individualism versus collectivism—shapes the strength of the ownership-engagement link, as well as how CBI mediates this relationship.

Using a quantitative approach, data were collected from a sample of 300 respondents via an online survey, designed to capture diverse cultural backgrounds. Structural Equation Modeling (SEM) was applied to analyze the data, with confirmatory factor analysis ensuring reliability and validity. Results suggest that brand ownership significantly enhances customer engagement behavior, with stronger effects observed in collectivistic cultures. Customer brand identification was found to mediate the relationship, providing deeper insights into the psychological processes underlying customer engagement. These findings contribute to both theory and practice by offering a nuanced understanding of how brands can foster engagement across cultural contexts.

Remote Work Dynamics: Impact on Productivity and Employee Satisfaction

Dr. Muhammad Bilal Ahmed

Hailey college of Banking and Finance, PU

Usaid Ahmed

Hailey College Of Banking and Finance, PU

Talha Sayaim

Hailey College Of Banking and Finance, PU

Abstract

The transition to remote work has rapidly gained significance in the modern workplace, particularly after the COVID-19 pandemic, which triggered a large-scale shift to virtual work environments. While remote work offers employees flexibility and autonomy, its impact on key outcomes such as productivity and satisfaction remains complex. This study examines the dynamics of remote work and proposes a model exploring the relationship between work environment, work-life balance, communication, autonomy, and organizational support with employee productivity and satisfaction. The study also considers how these relationships are mediated by employee engagement and stress, as well as moderated by individual factors like personality and job roles. Using a mixed-methods approach, including quantitative surveys and qualitative interviews, this research seeks to provide deeper insights into remote work practices and their effects on employee performance and well-being.

Scaling Circular Business Model: The Role of Anthropomorphism in Second Hand Fashion Retail

Anam Baharat

Hailey college of banking and finance, PU

Abstract

This study expects to investigate what humanoid attribution means for the versatility of roundabout plans of action (CBMs) in recycled style retail, zeroing in on customer commitment and the change from specialty to standard reception. The exploration inspects how humanoid attribution upgrades close to home commitment and works with methodologies for scaling CBMs. A reasonable model is fostered that recognizes the job of humanoid attribution at the item, brand, and stage levels in driving purchaser reception. The review proposes profound commitment as a middle person and purchaser demeanor toward manageability as a mediator in the connection among humanoid attribution and stage reception. Human plan procedures, like human-like stories for items, compassionate brand personas, and intuitive stage highlights, essentially improve profound commitment, encouraging trust and lessening the shame related with recycled products. Besides, shopper demeanor toward maintainability enhances the impact of humanoid attribution on reception and commitment. This double impact of profound commitment and supportability mindfulness speeds up the progress of recycled style from specialty to standard utilization, supporting both broadness and profundity scaling systems in CBMs. This examination adds to the writing on scaling CBMs by incorporating humanoid attribution as an original driver of customer commitment. By consolidating human techniques with process-based scaling draws near, the review offers bits of knowledge into how recycled style retailers can accomplish authoritative development (broadness scaling) while at the same time affecting far reaching pursues and routines (profundity scaling), subsequently propelling the roundabout economy.

Keywords; Anthropomorphism, Circular business model, Second-hand fashion, Consumer engagement, Sustainability

The Impact of Remote Work on Employee Productivity and Job Satisfaction in COVID-19

Dr. Muhammad Bilal Ahmed

Hailey College Of Banking and Finance, PU

Farakh Farooq

Hailey College Of Banking and Finance, PU

Muhammad Ubair

Hailey College Of Banking and Finance, PU

Abstract

The COVID-19 pandemic has led to a significant shift towards remote working, raising concerns about its impact on employee productivity and job satisfaction. This study investigates the effects of remote working on employee productivity and job satisfaction, using a survey of 500 full-time employees working remotely.

The results show that remote working has a positive impact on employee productivity, with 70% of respondents reporting increased productivity. This increase in productivity can be attributed to the absence of office distractions, reduced commuting time, and improved work-life balance. However, the results also indicate that remote working has a mixed impact on job satisfaction, with 40% of respondents reporting increased job satisfaction, while 30% reported decreased job satisfaction.

The study highlights the importance of autonomy, flexibility, and work-life balance in predicting employee productivity and job satisfaction during remote working. Employees who reported having more control over their work schedule and environment tended to experience higher levels of productivity and job satisfaction. Conversely, employees who reported feeling isolated or disconnected from their colleagues and organization tended to experience lower levels of job satisfaction.

The findings of this study provide insights for organizations to develop strategies to support remote working and improve employee productivity and job satisfaction. Organizations can promote autonomy, flexibility, and work-life balance by providing employees with the necessary tools and resources to work effectively from home. Additionally, organizations can foster a sense of community and connection among remote workers by promoting regular communication, collaboration, and socialization.

Effect of unemployment on youth

Muhammad Faizan

Hailey College Of Banking and Finance, PU

Rabbi Tayyab

Hailey College Of Banking and Finance, PU

Abstract

Youth unemployment is a significant and growing global issue, with profound implications for the economic, psychological, and social well-being of young people. This research explores the multifaceted effects of unemployment on youth, examining its impact on career development, mental health, and social inclusion. Prolonged unemployment can lead to long-term economic disadvantages, including lower lifetime earnings, delayed career progression, and diminished job prospects. Additionally, unemployment is strongly linked to negative psychological outcomes, such as depression, anxiety, and decreased self-esteem, which further hinder young people's ability to re-enter the workforce. Socially, unemployed youth are at higher risk of exclusion, leading to greater vulnerability to crime, political instability, and social unrest. The paper also reviews various policy interventions aimed at addressing youth unemployment, highlighting the need for comprehensive strategies that combine education, job training, and mental health support. Ultimately, this study underscores the importance of targeted interventions to mitigate the adverse effects of unemployment on young people and foster long-term societal and economic stability.

Cybersecurity Awareness and its Impact on Employees Behavior

Dr. Muhammad Bilal Ahmed

Hailey College Of Banking and Finance, PU

Fazila Rubab

Hailey College Of Banking and Finance, PU

Areeba Shahzadi

Hailey College Of Banking and Finance, PU

Abstract

In today's digital world, cybersecurity awareness has become critical for organizations to protect their systems and data. This is especially important in Pakistan, where businesses are rapidly adopting digital technologies but face increasing risks from cyberattacks. This research focuses on how cybersecurity awareness influences employee behavior and helps organizations prevent security breaches. Cybersecurity awareness means employees understand the risks of cyber threats, follow organizational policies, and adopt safe practices. These include recognizing phishing attempts, using strong passwords, and handling sensitive data securely. Employees who are aware of these risks are less likely to engage in behaviors that could expose their organizations to cyberattacks. However, in Pakistan, many employees view cybersecurity as the sole responsibility of the IT department, which leads to a lack of personal responsibility.

Challenges such as insufficient training programs, limited budgets, and outdated policies further weaken cybersecurity awareness efforts in Pakistan. Small and medium-sized enterprises (SMEs), which make up a large part of the economy, often lack the resources to provide regular training. These issues leave organizations vulnerable to cyber threats. Leadership and organizational culture play a vital role in promoting cybersecurity awareness. When leaders actively encourage cybersecurity practices and prioritize them as part of company values, employees are more likely to follow suit. Recognizing and rewarding employees for responsible cybersecurity behavior creates a positive environment that fosters awareness.

Technology also supports cybersecurity efforts. Secure systems, firewalls, and threat detection tools complement employee training by providing additional layers of protection. However, many organizations in Pakistan lack access to advanced technologies, which limits the effectiveness of these measures. Understanding the risks associated with cyberattacks is another important factor in shaping employee behavior. Awareness programs that include real-life examples and simulations help employees understand the consequences of security breaches, such as financial losses or damage to reputation. This makes employees more vigilant and careful in their daily tasks.

To improve cybersecurity awareness in Pakistan, organizations need to design affordable and engaging training programs that cater to employees with different levels of technical knowledge. Educational institutions can also introduce cybersecurity basics into their curricula to prepare future employees for digital workplaces. Policymakers can support these efforts by offering incentives for organizations to invest in cybersecurity.

The Impact of Organizational Learning and Strategic Alignment on the Operation Efficiency, Employee's Productivity and Management Performance

Nadia

Hailey College Of Banking and Finance, PU

Aqsa

Hailey College Of Banking and Finance, PU

Abstract

In today's business world, competition is no longer just about having resources, but about how effectively a company collects and uses information. The focus has shifted from simply gaining wealth to a time where learning and growth within an organization are essential for survival and continuous progress. This paper explores how organizational learning and effectiveness impact business operations, employee productivity, and management performance. The goal is to contribute new insights to the study of organizational learning. Arbitrary and defined inspecting strategies were utilized. Information assortment was finished with the utilization of a survey and examined utilizing corroborative component examination and progressive numerous relapse. The outcome from the information broke down shows that there is a positive connection between hierarchical learning and viability, tasks, representatives' efficiency and the executives' execution proposing that association learning influence is including in light of the fact that it influences and impacts the adequacy and effectiveness of all the staff at each level inside the association. The outcome from the information broke down shows that there is a positive connection between hierarchical learning and viability, tasks, representatives' efficiency and the executives' execution proposing that association learning influence is including in light of the fact that it influences and impacts the adequacy and effectiveness of all the staff at each level inside the association. Associations ought to endeavor and do all that could be within reach to guarantee authoritative learning since this study is in a period where information and advancing inside the association are more basic and vital to hierarchical endurance and persistent development.

Keywords: Employees productivity, Organizational learning, Effectiveness, Operations and Management performance

Factors Affecting Tourism, Tourism Potential and Strategies For Development As An Industry In Pakistan.

Eman Fatima

Hailey College Of Banking and Finance, University of The Punjab, Lahore

Saba Shahzadi

Hailey College Of Banking and Finance, University of The Punjab, Lahore

Abstract

Pakistan, like any other beautiful European country, is a big market for tourism because it offers not only beauty of nature but also variety and diversity in cultures. In fact, tourism is the most profitable and entrepreneurial business, especially for people living in mountain areas, because it creates new job opportunities and reduces unemployment. This study explores into the challenges and prospects facing Pakistan's tourist industry, focusing on issues such as limited infrastructure, security concerns, terrorism, political instability, and societal obstacles. Despite its natural and historical attractions, the sector is facing worldwide competition challenges. The study's goal is to identify challenges, investigate hidden tourism potential, and provide sustainable development alternatives. Its significance is in promoting economic progress, cultural exchange, and improving Pakistan's global image. Key questions include around natural and cultural attractions, government involvement, cultural asset conservation, security concerns, and safety perceptions. The fall in tourist visits is ascribed to political and economic issues, as well as government inaction. The report provides strategic insights for overcoming obstacles, unleashing tourist potential, and encouraging long-term growth in Pakistan, while anticipating favorable shifts in the industry, economic outcomes, cultural links, and worldwide perceptions. To advance the business, the study suggests government commitment, infrastructure improvements, prompt settlement of insurgency issues, international partnership building, good media depiction, and other important steps. If the government makes significant measures to improve Pakistan's tourism infrastructure, then there will be a notable rise in tourist visits and economic contributions to local communities. If Pakistan's security concerns are successfully handled by strategic planning and implementation, then tourists' perceptions of safety will improve, resulting in greater tourist arrivals. If Pakistan's cultural heritage sites are actively conserved and promoted, then there will be a better degree of engagement in tourism activities and an enhanced cultural experience for visitors.

Adoption of Solar Energy Benefits and Drawbacks in 2024: The Role of Technological Advancement

Abstract

The aim of this Research is to investigate the state of solar energy adoption as of 2024. Analyzing the advantages, disadvantages, and difficulties associated with the broad implementation of solar energy systems is its goal. It also looks at the role of technology developments, like cost reduction, energy storage, and solar panel efficiency increases, and how these things mediate or lessen the obstacles to wider adoption. Policymakers, industry stakeholders, and consumers are to gain important insights from the study about the viability, potential, and obstacles to the current and future scaling of solar energy technology. In order to evaluate trends in the use of solar energy, technological developments, and cost implications, the design, methodology, and approach employ a mixed-methods approach, integrating quantitative analysis with qualitative data from government publications, case studies, and expert interviews. This method enables a thorough comprehension of the social and technical factors affecting the development of solar energy in 2024. The results show that technological advancements in manufacturing, storage, and solar panel efficiency have drastically lowered costs, increasing the accessibility of solar energy. There are still obstacles to overcome, though, like high upfront prices, problems with energy storage, and efficiency-reducing geographic restrictions. Although regional variations affect the rate of adoption, government regulations and incentives are crucial in removing these obstacles. The study's dependence on publicly available data, which might not encompass all new technologies or account for regional differences in solar energy infrastructure and policies, is one of its shortcomings. Furthermore, broader industry changes could not be covered by the emphasis on particular technological developments. This research is valuable because it can help businesses, environmental advocates, and governments understand the advantages and disadvantages of adopting solar energy. It provides useful insights into how policy and technology developments can get over current obstacles and encourage a global shift to sustainable energy systems.

Keywords: Solar Energy, Technological Advancements, Energy Storage, Renewable Energy, Cost Reduction, Sustainability, Energy Efficiency, Grid Integration, Environmental Benefits.

The Economic Ramifications of a Muslim World Boycott on Israeli Products

Muhammad Talha Zahid

Hailey College Of Banking and Finance, University of The Punjab, Lahore

Hafiza Zunaira Fiaz

Hailey College Of Banking and Finance, University of The Punjab, Lahore

Abstract

The boycott of Israeli products by Muslim-majority countries, particularly in response to political crises like the **GAZA genocide**, has the potential to evolve from a symbolic act of protest into a sustained economic campaign with profound implications for Israel's economy. This article explores the **economic ramifications** of such a boycott, examining its potential to disrupt Israel's trade relations, particularly in key sectors such as food, defense, and technology. By analyzing past instances of economic sanctions and boycotts in global geopolitics, such as the 'anti-apartheid boycott of South Africa', the study examines contemporary literature to provide insights into how a prolonged boycott could affect **Country's GDP, foreign investment, and export revenue**. The research also explores the potential ripple effects on regional and global markets, as Israel's economic ties to the Muslim World are significant despite political tensions. In short, the study concludes that countries seeking alternatives to Israeli products in certain global markets might experience shifts in the supply and demand of key commodities, would likely result in a reconfiguration of trade routes and alliances over time the long term. This comparative article also provides a nuanced understanding of how political boycotts can evolve into economic campaigns with lasting economic consequences.

The Legal obligation of Promises in Islamic Banking: A jurisprudential perspective and Modern Applications

Hamza Shoaib

Sheikh Zaid Islamic Center, University of the Punjab

Abstract

All the alternatives methods introduced in place of conventional interest-based banking systems consist of multiple contracts. (In Islamic banking, there is hardly any contract that is free from the concept of iltizam bil wa'ad [commitment to a promise]). However, the general principle in Islamic law is that combining multiple contracts within a single agreement (safqah fi safqah) is not permissible.

To address this, Islamic banks developed a system where, instead of combining contracts, they require customers to make legally binding promises to fulfill different contracts in sequence. This approach ensures compliance while maintaining the appearance of adhering to Islamic principles. This method is now the foundation for Islamic banking practices worldwide.

Since these institutions are labeled as "Islamic banks" and claim to operate under an Islamic framework, it is essential to evaluate their practices in light of Islamic jurisprudence. The key questions are: How much flexibility does Islamic law actually allow for iltizam bil wa'ad? Could this practice potentially fall under the prohibited categories of safqah fi safqah (combining contracts) or bay' bil shart (conditional sales)?

This article seeks to explore these questions and fill the gap by providing a thorough analysis based on Islamic teachings.

Keywords: promise, legally binding promises, Islamic banks, iltizam bil wa'ad, combining contracts, conditional sales, bay' bil shart.

Enhancing usability of Mobile Banking in Pakistan for leveraging financial inclusion and social impact

Abdul Hafeez Muhammad

Bahria University Lahore Campus, Pakistan

Ansar Siddique

Bahria University Lahore Campus, Pakistan

Amna Faisal

Bahria University Lahore Campus, Pakistan

Abstract

Mobile banking offers the convenience of managing financial transactions due to lot advantages through mobile applications, yet many users face challenges and hesitate to adopt it due to complex user interfaces especially less literate users. Usability researchers emphasize the evaluation of product design based on usability and design guidelines to develop user centered design product. A study was conducted to evaluate and assess the three Pakistani internet mobile application through System Usability Scale (SUS) and Heuristic evaluation, In first phase of study, survey with novice users was conducted to analyze the satisfaction level of mobile apps of Muslim Commercial Bank (MCB) and The Bank of Punjab (BOP) which results that users are unsatisfied with interface while using app. Later Heuristic evaluation i.e., one of famous usability evaluation method was performed to identify usability related issue through usability experts where they examined the same application using Nielsen's ten heuristics. Experts identified usability issues and offered design improvement suggestions to enhance the overall user experience. In third phase, based on the findings from the heuristic evaluation, new AI based design prototype was proposed to overcome usability challenges. A proposed porotype is business innovation for leveraging financial inclusion and social impact. The study highlights the role of AI in enhancing mobile banking usability, offering an accessible solution to less literate users that addresses the needs of a wider range of users and promoting greater adoption of financial technology.

Keywords: Mobile Banking, Usability Evaluation, Prototype, Heuristic evaluation

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Impact of social media marketing on customer behavior

Dr. Muhammad Bilal Ahmed

Hailey College of Banking and Finance, PU

Dania Asghar

Hailey College of Banking and Finance, P

Abstract

Social media marketing has become a pivotal tool for businesses seeking to influence customer behavior and drive sales. This research article explores the effects of social media marketing on consumer behavior, examining how different strategies and platforms impact customer engagement, brand perception, and purchasing decisions. Through a comprehensive literature review and analysis of empirical data, this study aims to provide insights into the mechanisms through which social media marketing shapes customer behavior and offers recommendations for businesses to optimize their social media strategies.

The Impact of Lean Manufacturing on Supply Chain Performance in the Pakistani Textile Industry

Shezil Shahid

Information Technology University, Lahore, Pakistan

Dr Muhammad Adnan Sial

University of Education, Lahore, Pakistan

Abstract

The objective of this research topic was to study and evaluate the effects of the integration of lean manufacturing on the supply chain performance in the textile sector of Pakistan under the domain of innovative production strategies. The study also examined operational efficiency as a mediating variable and organisational culture as the moderator. The four supply chain measures under focus were Delivery Accuracy, Turnover, Lead Time, and customer satisfaction; the lean tools assessed were Just-in-Time and Total quality management. The current research utilised analytical cross-sectional research and a sample of 200 employees working in the textile industry were approached to fill in the questionnaire. The research is a formal, cross-sectional, causal study conducted using communication-based data collection (questionnaires) to examine the impact of lean manufacturing on supply chain performance in Pakistan's textile industry. Cronbach's Alpha was used to check the reliability of the data. Studied hypotheses were tested through Process Hayes for SPSS version 27. The research reveals that lean practices help reduce waste, enhance resource utilisation efficiency, and improve manufacturing planning to meet the targets. An organisational culture with an innovative culture embraces flexibility and decentralised decisions, empowering organisational personnel to improve outcomes. The research also shows that operational efficiency partially explains the level of relationship between lean practices and supply chain performance. The findings of the research are helpful for the practitioners for a better understanding of devising policies for applying lean manufacturing to attain competitive advantages in the Pakistani textile industry.

Financial Literacy, Risk Appetite and Stock Market Investments; Intellectual Investment or Actual Investment

Sehrish Fraz

Information Technology University of the Punjab

Dr. Muhammad Adnan Sial

University of Education, Lahore, Pakistan

Abstract

This study was based on three variables: Financial Literacy as an independent variable, Risk Appetite as a moderating variable and Stock Investments as a dependent variable. The studied population consisted of persons with financial knowledge who had been or ever invested in the stock market. This research was limited to a small number of financially literate people, so the sample size was 150. A convenient sampling technique was used to collect the primary data through Google Forms. Cross-sectional and field design was implied during the research. The primary data of 100 respondents were collected through a questionnaire developed based on scales adopted from past studies. The validity of the data was ensured through Cronbach's alpha. The hypothesis was tested through PROCESS for SPSS and SAS 2013-2016 Andrew F. Hayes and the Guilford Press macro installed and run on SPSS version 27.

Digital marketing

Khansa Butt

Information Technology University of the Punjab

Dr Adnan Sial

University of Education, Lahore

Abstract

This research focuses on the dynamic aspects of DEM and evaluates how it has revolutionized consumer relations as well as business models. Based on three major cases of personalized marketing, influencer marketing, and user-generated content (UGC), this study analyzes how these strategies change the brand-consumer dynamics. Personalized marketing is focused on customers communicating with them in a way that will make them have a strong tendency to purchase a product. Influencer marketing, or the use of social media figures, enhances perception of brands within the targeted audiences positively. UGC is positioned as a way to create higher levels of authenticity and to establish more profound emotional connections due to the content created by consumers.

This paper adopts a qualitative research methodology with the use of case studies and industry reports to assess the efficiency of the aforementioned strategies. Findings show that organizations that use these techniques enjoy increased engagement, better customer loyalty, and better brand image. Furthermore, the research also indicates that it is important for firms to keep up with technologies, AI-driven analytics, and the social media platforms that are rapidly growing in the market.

This paper finds that for organizations operating in the intensively evolving digital environment, it is imperative to adopt customer-oriented and technological solutions to marketing. The study presents a considerable contribution to the existing literature of marketing management for those strategists interested in enhancing their methods while working in a highly integrated and growing environment.

The Impact of AI on Organizational Decision-Making

Rimal Khan

Information Technology University of the Punjab

Dr. Muhammad Adnan Sial

University of Education, Lahore

Abstract

This study investigates how the integration of artificial intelligence in organizations affects decision-making and relates to the quality, speed, and accuracy of organizational decisions. A conceptual model with AI integration as an independent variable, decision quality as a dependent variable, the mediating variable data-processing capabilities, and organizational culture as a moderating variable is proposed. An cross-sectional research design was applied, and structured questionnaires were administered to 120 employees who work in AI-integrated organizations, and the sample size was 200. The participants were conveniently selected, and the questionnaire combined self-developed items and standardized instruments adopted from previous studies. Reliability of the survey instrument was established through Cronbach's Alpha testing. PROCESS Model by Andrew F. Hayes was applied using SPSS 18 to test the hypotheses that allow the analysis of moderation and mediation effects. It indicates that AI integration significantly enhances the quality of decisions through the reduction of human errors and improvements in data-driven insights. Data processing capabilities were seen as a mediator, whereby organizations with advanced data systems benefit more from AI integration. Organizational culture also moderates the relationship between AI integration and decision quality; that is, a culture that is supportive and innovative amplifies the positive effects of AI. This research contributes to understanding the transformative role of AI in organizational practices and offers actionable recommendations. Organizations are encouraged to invest in robust data infrastructures, foster innovation, and provide training that maximizes the potential of AI-driven decision-making processes.

The Impact of Social Media on Consumer Purchase Intentions

Sammar Saddique

Information Technology University, Lahore, Pakistan

Dr. Muhammad Adnan Sial

University of Education, Lahore, Pakistan

Abstract

This research aimed to explore the impact of social media on buying decisions, including the target population of university students. Specifically, the study sought to establish the moderating effects of personal innovativeness, buying impulse, self-efficiency, attitudes towards online shopping, perceived control behaviour, perceived ease of use, and decision-making process in an online shopping context. A cross-sectional quantitative research design was adopted, with data obtained through a convenience sampling technique. The primary data was collected from 102 respondents through Google Forms. The studied hypotheses were tested through PROCESS for SPSS version 27. Buying Impulse was assessed using the Impulse Buying Tendency Scale by Rook (1987). Attitudes Towards Online Shopping were gauged using a scale adapted from Kim and Stoel (2004). The studied hypotheses were tested, and the relations between the variables were established by employing statistical methods based on the data collected. On this basis, results highlighted that social media considerably affects consumer purchase intention regarding ease of use, perceived attitude towards online buying, and perceived control over the buying process. Other personality factors that impact purchasing include personal innovativeness, which refers to the readiness to adopt new technologies and the propensity to buy impulse. The findings thus offer relevant implications for marketers and firms interested in university student consumers. The study shows how incorporating social media into the marketing communication framework can help fully capitalise on the opportunity of this influential consumer segment.

Technology and Innovation, Adaptation of Ai and its impact on customer service in the retail sector

Nadia Saeed

Hailey College of Banking and Finance, PU

Abstract

The integration of Artificial Intelligence (AI) into the retail sector has significantly transformed customer service, introducing unprecedented levels of efficiency, personalization, and scalability. AI-driven solutions such as recommendation systems, chatbots, and predictive analytics enable retailers to offer tailored experiences while automating routine processes. These technologies optimize inventory management, streamline customer interactions, and enhance both online and in-store experiences through tools like virtual assistants and augmented reality applications.

AI not only boosts operational efficiency but also provides actionable insights into consumer behavior, allowing businesses to anticipate trends and align strategies with customer preferences. However, the adoption of AI also raises challenges, including data privacy concerns, potential algorithmic biases, and workforce disruptions. Addressing these issues requires a balanced approach that prioritizes ethical practices and transparency.

As AI continues to evolve, its potential in hyper-personalization, voice commerce, and sustainable retail practices will further redefine customer service paradigms. Retailers embracing AI must innovate responsibly to build trust, maintain loyalty, and deliver value in an increasingly competitive

AI Tools and Their Impact on the Growth of Modern Business Development

Hamza Yousaf

Information Technology University, Lahore, Pakistan

Dr. Muhammad Adnan Sial

University of Education, Lahore, Pakistan

Abstract

This study aims at establishing the role of today's AI tools in promoting business development with emphases on the effectiveness of operation, relationship with customers, and gathering and analyzing data. As organizations continue to adopt AI solutions with an aim to improve completeness in the modern market this research aims at building the knowledge on how AI methodologies help organizations achieve competitiveness in the digital market place. The questions that the study seeks to answer revolve around the use of AI systems in enterprises and the enhancement of same. The research adopts a formal, descriptive and cross-sectional research approach and in the process uses only quantitative research instruments for data collection whereby the authors undertake the collection of the primary data used in the research. Participants were recruited using Google Forms at the workplace and hundred and two questionnaires were filled. In this study, convenience sampling was adopted while the questionnaire was designed according to previous research, and its reliability estimated through Cronbach's Alpha. The mediating effect of the variables was estimated using the mediated model with the PROCESS Hayes macro in SPSS 18. The analysis suggests that the use of AI tools is essential for the promotion of business development using technological solutions that enhance the functioning of everyday tasks, customer experiences, and problem-solving based on analysis. However, the study also reveals the weakness such as high implementation cost of the system and poor workforce acceptance of the change. Nevertheless, the research is equally useful to shed light on the advantages of AI tools while its limitation originates from the small sample size as well as the convenience sampling technique.

Unlocking Business Potential through Digital Transformation: Leveraging AI and Design for Enhanced Performance

Muhammad Ubaid

Information Technology University, Lahore, Pakistan

Dr. Muhammad Adnan Sial

University of Education, Lahore, Pakistan

Abstract

This study explores the relationship between artificial intelligence, design thinking, and business performance in the context of digital transformation. The population studied consisted of hundred respondents, who were selected using a convenience sampling technique. Primary data were collected through a comprehensive questionnaire distributed via Google Forms and physical surveys. The questionnaire was designed using validated scales adapted from prior studies to ensure the robustness of the data. Cronbach's alpha was utilized to test the reliability and confirmed the internal consistency of the scales. Hypotheses were tested using the Hayes Process Macro installed and run in SPSS, allowing a more rigorous examination of direct, indirect, and moderating effects. This study uses a quantitative research design with a cross-sectional approach to assess the relationships between AI, design thinking, and business performance. The results show that AI can significantly automate business processes, facilitate decision-making, and improve operations. Analogous to this, design thinking came out as the mediator for innovation and aligning technology solutions with customer needs. Altogether, these aspects ensure better business outcomes through improved revenue, customer satisfaction, and innovation capacity. It's evident from the findings of this study that strategic operations in business can incorporate AI and design thinking with enormous transformative potential. In such a manner, valuable knowledge for practitioners and researchers in the domain of digital transformation can be derived from it.

Digital Marketing Through the Lens of Personalized Marketing, Influencer Marketing, And User-Generated Content

Khansa Butt

Information Technology University, Lahore

Dr. Muhammad Adnan Sial

University of Education, Lahore

Abstract

This research explores the transformative impact of Digital Marketing on consumer relations and business models, focusing on personalized marketing, influencer marketing, and user-generated content. Personalized marketing engages consumers with tailored communication, increasing purchase intentions. Influencer marketing leverages social media figures to enhance brand perception within target audiences, while user-generated content fosters authenticity and emotional connections by featuring content created by consumers. Using a quantitative methodology with case studies and industry reports, the study assesses the effectiveness of these strategies. Findings reveal increased consumer engagement, loyalty, and improved brand image for organizations employing these methods. The research highlights the importance of adopting technologies, AI-driven analytics, and adapting to rapidly evolving social media platforms. Structured questionnaires targeting 200 employees and responses from 120 participants was received. Convenient sampling was used, and the questionnaire combined original items and modified instruments from previous studies. The PROCESS Model by Andrew F. Hayes, applied via SPSS 18, tested hypotheses on moderation and mediation effects. Results emphasize that organizations must integrate customer-oriented and technological solutions to thrive in a fast-evolving digital landscape. This study contributes significantly to marketing management literature, offering practical insights for strategists in highly integrated and growing markets.

The Impact of Data Analytics on Business Decision-Making: A Study of Data-Driven Strategies

Azan Ahmad

Information Technology University, Lahore

Dr. Muhammad Adnan Sial

University of Education, Lahore

Abstract

This research explores the effect of data analysis on organizations' decision-making with regard to how analytics-based solutions affect digital marketing tactics and customer interactions. The objectives of the research are to establish how data analytics can improve organisational performance, especially in the management and strategic decision-making process, and discuss the ethical issues of the fake news phenomenon in the context of interpretational manipulation. Using a formal research design, quantitative research design was used with structured questionnaires administered on Google Forms to 106 participants using convenience sampling method. This study was a non-synchronized ex post facto research, where variables and their relationships were investigated without direct intervention, and the time frame of the study was cross-sectional to obtain data at a given time only. Causal and descriptive mediation analysis was conducted using PROCESS Hayes macro in SPSS 18. Planned as a field study, this research emphasises the importance of higher-level marketing and data analysis in enhancing decision-making on communicating marketing messages, managing customer interfacers effectively, promoting products effectively and efficiently. Although it comes with a?" ethical concern on the way data will be used in an unethical manner with regard to advertising and specifically with regard to astonishingly crafted darts, thereby underlining principles and practices of ethical standards and consumer protection. Of course, using convenience sampling and having a relatively small sample, the study demonstrated the potential of explaining how big data is used in modern business processes.

Volatility Dynamics of Shariah-Compliant and Non-Shariah-Compliant Equity Portfolios: A Case of Emerging Economy

Dr. Unbreen Arif

University of Education Lower Mall Campus, Lahore.

Abstract

The global demand for Shariah-compliant investment has witnessed an upward trend, the Islamic finance industry is expected to grow US\$6.67 trillion by 2027 as reported by the Islamic Finance Development Bank. The fundamental principle of Shariah Compliant investment is based on the sharing of risk and return instead of speculation and fixed returns, which motivates to assess the risk more carefully for Shariah Compliant Investment. The current study empirically investigates the risk and return profile of Shariah-compliant and non-Shariah-compliant stocks to build optimal portfolios. The performance dynamics of conventional and Shariah-compliant stocks of the emerging economy were analyzed in multiple dimensions, including risk-adjusted return, volatility, and efficiency, in terms of Sharpe, Treynor, and Sortino ratios. The study analyzes the PSX dataset from 2010 to 2023, benchmarked against the KSE 100 Index for conventional equity portfolios as well as the KMI 30 Index for Shariah-compliant equity portfolios. The research contributes to the academic literature, providing insight through evaluating the performance of conventional and Islamic investment portfolios in an emerging market. The findings also provide insight to policymakers, fund managers, and investors to comprehend factors that elucidate equity portfolio performance under two dimensions. The results support the development of the Islamic finance industry in emerging economies and highlight how the goal of optimal portfolios can be attained under Shariah-compliant investments to foster financial inclusion and sustainable economic growth.

Key Words: Shariah Compliant Investment, Optimal Portfolio, Asset Pricing, Sustainable returns, conventional finance

The Dynamic Linkage Between Technological Innovation, Economic Growth and Environmental Degradation: A Case Study Of Pakistan

Rizwan Qaiswer Danish
Khyzer Bin Dost
Zrtasha Ghaffar Khan
Nosheen Pervaiz Awan

Abstract

The main objective of this study is to investigate the relationship between technological innovation, economic growth and environmental degradation in Pakistan. The period covers 1980 to 2014. ARDL bound test has been applied to determine the long- and short-run relationships between the variables. The empirical results illustrate that technological innovation has a significant and positive impact on CO2 emissions in the long and short run. Economic growth significantly and negatively affects environmental degradation in the long run. Thus, increasing economic growth improves the environmental quality in the long run. Energy consumption has a positive and statistically significant impact on environmental pollution. Urbanization has an inverse relationship with environmental degradation in Pakistan. The short-run results also found the effect of technological innovation, economic growth, energy consumption, and urbanization on environmental degradation in Pakistan.

Keywords: Environmental degradation, technological innovation, Economic growth, and CO2 emissions.

Understanding the Business Model

Amna

Hailey College of Banking and Finance, PU

Areesha Ikhlaq

Hailey College of Banking and Finance, PU

Abstract

The study offers a comprehensive and multidimensional analysis of the existing literature on business models, looking at the idea of a business model from a variety of subject-matter perspectives. The review shows that there is disagreement among academics over the definition of a business model and that the literature is primarily evolving in silos based on the phenomena that each researcher is interested in. But we also discovered some new themes that business model researchers have in common. In particular,

- Business models are becoming a new analytical unit
- Business models stress a system-level, holistic approach to elucidating how firms "do business"
- Firm activities are crucial to the different business model conceptualizations that have been put forth; and
- Instead of focusing only on how value is acquired, business models aim to describe how it is created. These new topics may act as impetuses for a more cohesive approach to business model research.

The Impact of AI on Organizational Decision-Making

Rimal Khan¹, Dr. Muhammad Adnan Sial²

¹School of Business and Management, Information Technology University

²Assistant Professor: UE Business School, Division of Management and Administrative Science, University of Education, Lahore

Abstract

This study investigates how the integration of artificial intelligence in organizations affects decision-making and relates to the quality, speed, and accuracy of organizational decisions. A conceptual model with AI integration as an independent variable, decision quality as a dependent variable, the mediating variable data-processing capabilities, and organizational culture as a moderating variable is proposed. A cross-sectional research design was applied, and structured questionnaires were administered to 124 employees who work in AI-integrated organizations, and the sample size was 200. The participants were conveniently selected, and the questionnaire combined self-developed items and standardized instruments adopted from previous studies. Reliability of the survey instrument was established through Cronbach's Alpha testing. PROCESS Model no 4. By Andrew F. Hayes was applied using SPSS 18 to test the hypotheses that allow the analysis of moderation and mediation effects. It indicates that AI integration significantly enhances the quality of decisions through the reduction of human errors and improvements in data-driven insights. Data processing capabilities were seen as a mediator, whereby organizations with advanced data systems benefit more from AI integration. Organizational culture also moderates the relationship between AI integration and decision quality; that is, a culture that is supportive and innovative amplifies the positive effects of AI. This research contributes to understanding the transformative role of AI in organizational practices and offers actionable recommendations. Organizations are encouraged to invest in robust data infrastructures, foster innovation, and provide training that maximizes the potential of AI-driven decision-making processes.

Introduction

Artificial intelligence integration within organizational processes is transforming the nature of decision-making through quality improvement, speed, and precision in outcome delivery. Since the advent of a data-driven business world, the capacity to analyze enormous datasets and churn out actionable insights has increasingly become crucial. The efficient use of AI, though, depends not on any technological advantage but rather involves a sound data infrastructure with an appropriate organizational culture toward meaningful influence.

The transformative role of AI in organizational decision-making will be explored in a conceptual model. Organizational data processing is the independent variable, and decision quality the dependent variable with mediator and moderator effects to the same model, that of organizational culture. Although existing literature posits AI as a method that potentially decreases errors and gives superior insights into data, the effect is further probed using mediating and moderating mechanisms. It emphasizes how advanced data systems and innovative, supportive organizational cultures amplify the positive impact of AI.

This research, therefore, fills critical gaps in understanding how organizations can maximize the benefits of AI-driven decision-making by examining the interplay between AI, data infrastructure, and culture. Findings emphasize the need for organizations to invest in robust data

systems, foster innovation, and provide training that empowers employees to adapt to AI technologies, thereby enhancing decision-making outcomes and organizational performance.

Broad Area of Research

The overall research area is Artificial Intelligence in Organizational Management. This generally encompasses how AI technologies are used in organizational processes and decision-making frameworks, together with their broader implications for management practices, business efficiency, and innovation.

Specific Area

The specific area of the research focuses on AI-Driven Decision-Making and its Relationship with Decision Quality, Organizational Culture, and Data-Processing Capabilities. It examines the mechanisms through which AI integration impacts decision-making processes in organizations, highlighting mediating factors (data systems) and moderating factors (organizational culture) that influence decision quality.

Research question

How does the integration of artificial intelligence influence the quality of organizational decision-making?

Significance of the study

AI has played a very important role in how organizations make decisions as it provides strong instruments to work with large amounts of data, improve the accuracy of the outcome, and minimize human factor. This research will therefore be important in understanding how AI can enhance the quality, timeliness, and correctness of decisions across firms. AI has the potential capability of creating a great impact that cannot be realized by any technological system; nevertheless AI success will depend on the environments that it can implement. Thus, this research adds to the existing literature by addressing the question of how data-processing capabilities influence the impact of AI and how organizational culture moderates the effects of AI.

The solutions of this study will be relevant for organizations that want to get the most value from AI. It acknowledges that having good data systems means adopting AI to get deeper into the problems and generate better solutions. Further, by promoting a healthy and progressive organizational culture, various benefits retrieved from AI are enhanced. This research is also useful because it offers specific implementation strategies including funding infrastructure, training human capital, and cultivating innovation.

At the same time, this study also enriches the academic knowledge base by proposing the integration of AI concept framework, relating it to the decision making results. It addresses gaps in the existing research by exploring both direct and indirect effects of AI on decisions. As businesses and societies continue to adapt to rapid technological changes, understanding AI's impact on decision-making processes is essential. This research offers insights that can guide organizations in navigating these changes responsibly and effectively.

Motivation of the study

The purpose of this research lies in the growing dependence of contemporary organizations on artificial intelligence to improve managerial decision-making. With firms attempting to deal with the challenges that come with the increasing global uncertainty and volatility, AI engenders unprecedented possibilities to elevate the quality of organizational decisions and streamline organizational processes and performances. Although many parties have acknowledged the positive impact of AI, few studies have ever explored how such changes occur.

Indeed, the processes of how ordinary data-processing capacities act as mediators and how organizational context functions as a moderating variable remain underdeveloped. These seem to be relatively uncharted territories and this work seeks to fill the gaps by exploring how these variables may work in synergy to determine AI integration results. The research is driven by the dearth of theoretical and empirical accounts of AI implementation as well as lack of effective applications of AI in organizations. From a theoretical viewpoint, the study is valuable to the existing body of literature on decision-making aided with Artificial Intelligence by advancing a theoretical model connecting use of AI inside firms to decisional quality moderated and mediated by certain mechanisms. This framework offers a more detailed view of how organizations can use AI to their advantage and what structural and cultural requirements promote these endeavors. In fact, due to the lack of theoretical framework, the study is more or less motivated by the dearth of prescriptive strategies that an organization can implement toward leveraging AI. In as much as many organizations continue to dedicate significant resources towards AI technologies, there is often need to identify key enablers and constraints to AI success to increase chances of actualization and sustenance of investment. Furthermore, this study is informed by the ethical and cultural concern that is related to AI deployment. High-value decisions are being made by AI more and more, therefore first, it is critical to create appropriate conditions for the proper functioning of these systems and, second, to ensure the interaction of such systems with people in full. Describing and analyzing the relationship between infrastructure, culture, technology and the environment, this research contributes to a better understanding of how AI can be embraced and supported while staying relevant to organizational and societal goals. In conclusion, the work aims at enhancing organizations' ability to manage challenges associated with AI implementation with the goal of harnessing its value in driving enhanced decision and organizational performance.

Literature review

AI Integration as the Independent Variable

AI integration can thus be defined as the implementation of AI in organizations whereby technological solutions are put into use in an organization in order to optimize its performance, its precision and make better decisions through analysis. AI integration refers to the use of machine learning techniques and patterns, NLP tools and analytics and predictive models to support process automation, large data processing and data feedback. As the result, this specific technological adoption has become an indispensable factor for organizations which aim to continuously remain competitive in the contemporary world. AI systems are capable of analyzing data in a manner impossible with conventional approaches and might even stream new patterns that had not been seen before.

The integration of AI is relatively in terms of the level and range—depending on the requirement of the organization and the access to resources. Examples include functional decisions, or choices that involve flow activities such as logistics or inventory, where AI algorithms could potentially reduce failures. On a tactical level, AI is used for extrapolating market movements, identifying competitor actions or modeling consumers in a consumer to business context. We can also therefore infer from Davenport and Kirby (2016) that the level of integration that needs to be achieved to support advanced analytics, again varies with the technological sophistication, technical foundations and the strategic vision of the leadership. Thus, integration is not only technical since it encompasses matching a few strategies and work processes to the technology's capabilities to achieve higher value.

Most of the theoretical frameworks useful⁹⁷ in comprehending the processes of adopting and implementing innovations as far as artificial intelligence technologies are concerned is well-

developed. The Technology-Organization-Environment (TOE) Framework is a crucial model to examine AI implementation adoptions (Tornatzky & Fleischer, 1990). According to the TOE model, technological innovation encompasses three interlinked factors: the organization's technological maturity, development capabilities or organizational culture match and the external pressures and incentives in the technological environment the organization operates in. AI integration therefore fits well with this model because ideal adoption requires strong architectures of data support, corporate culture, and sensitivity to market or competitive forces.

To this end, the TOE Framework is complemented by the Unified Theory of Acceptance & Use of Technology (UTAUT) developed by (Venkatesh et al., 2003) in the given context. The factors emphasized in this model include usage intentions; and factors significant to adoption, including performance expectancy, social influence, and facilitating conditions. These insights are very useful while considering the AI integration because trust and user acceptance shape the degree of the AI use. For instance, those organizations that have clear and unambiguous performance goals coupled to correct training provision will better be assured of successful AI implementation.

The use of artificial intelligence has a direct impact on the speed, accuracy with which the organization's analyses are produced, and the degree of detail. Such complex systems rely on the computations of large datasets in real-time to discover latent structures and then make predictions to guide organizational strategies. Mukherjee and Kak N.A states that this capability enhances decision making by eliminating Human Cognitive bias and error hence making organization responsive to emerging trends and challenges. For example, the diagnostic tools like IBM Watson have shifted the practices of diagnostics, by aggregating patient information and literature. In a study by Esteva et al. (2017) the authors were able to establish accuracy levels of more than 90 % in diagnosing skin conditions using AI diagnostic systems more than most human experts. In the same way, in the financial sector, predictive analytical AI applies the same model in enabling right investment choices based on pattern detection in the market, accurate risk determination and real-time portfolio management. In retail, for instance, artificial intelligence in personnel recommendation and marketing approach also improves customers' selling and engagement by gaining more sales and customer attachment to certain brands.

However, there is several issues when integrating AI. The lack of transparency or 'explainability' of the AI algorithms; That is the fact that it becomes hard for decision makers to know how such systems come to a specific decision or make particular forecasts which makes accountability a tricky issue and can be met with resistance from decision-makers who do not wish to rely on systems they cannot fully 'explain'. Moreover, pro-ethnic bias constantly induces discrimination as it is exemplified by racially prejudiced hiring algorithm which provides certain demographic groups with lower scores.

Moreover, AI integration can successfully be implemented but meets numerous organizational challenges such as mistrust to new solutions which can take over employees' workplace or perceptions of the employees that perceive AI as their threat rather than a tool. To eliminate such points of friction, simultaneous steps have to be taken in different areas besides ethical regulation of AI: culture of innovation has to be established, and the employees have to be trained in the new conditions of AI integration into the work processes. To fully unlock the potential of AI inside organizations, and enhance decision-making performance, these barriers must be addressed.

AI integration is a critical and independent factor in the organization's decision-making process. What it provides is the ability to further refine those adjustments, allowing for greater accuracy and productivity while at the same time adding factors which have to be considered. Technological, cultural, and strategic COPs are acknowledged to be vital success factors when

exploiting this groundbreaking technology by addressing the prospect and discourage both the AI advantage and disadvantage concurrently.

Decision Quality as the Dependent Variable

Decision quality is important in establishing success in the organizational processes and strategies to be employed. That is how well decisions deliver intended consequences, support organizational strategy and utilise resources efficiently. A high quality decision making entails getting a solution to the problem or the task at hand within a right, desirable and an on-time fashion (Kahneman & Tversky, 1979). It is the kind of decision that reduces the chances of failures and or uncertainties while increasing the chances of success. Criterion decision quality, which takes place in an organizational context, primarily determines financial and organizational performance, competitiveness, profitability, and adjusting to changes in the environment. Decision quality acts therefore as dependent variable, which can be quantified with the results of attitudes like the integration of AI, the organizational culture, and the capacity of processing data.

Decision quality therefore is defined as being inherent in the decision making process. Conventional approaches involve decision making based on inherent human instincts and judgement which are affected by heuristics and a finite ability to handle vast amounts of data. According to Kahneman et al. (2011) some biases existing in S are overconfidence, anchoring, confirmation bias and therefore didactically decrease efficiency of S and its accuracy in decision making. On the other hand, integration of AI has benefits of providing data and decision-making information, on time and on the basis of recent data collected, devoid of such restrictions.

Artificial Intelligence has risen to the occasion as an organizational tool for improving the quality of the decisions made. By applying complexity and deep learning, NLP, and predictive analysis, AI systems of course, analyze big data volumes and make prescriptive predictions. This capability increases the efficiency of decisions by minimizing errors, raising precision, and increasing pertinence. This is where AI brings in its services most beneficially by helping avoid human bias. Unlike human decision makers who take decisions based on own biases, beliefs and heuristics, AI systems deal with data; quantified information and statistical algorithms (Russell & Norvig, 2021).

For example AI has advanced diagnostic accuracy in the health field. Esteva et al. (2017) also showed that AI systems can diagnose skin diseases with seniority above 90% while sometimes even surpassing dermatologists. Clinically related information in these systems is enriched with patient records and analysis of related medical publications and guidelines; hence, more accurate diagnostic input and faster, high-quality decision making is attained. Likewise in the area of logistics and supply chain management, AI enhances inventory control, demand forecasting and minimizes time gaps. Organizations such as Amazon and Walmart use predictive analytics platforms, which inform decisions instantly, lowering costs and increasing customer satisfaction, depending on metrics.

The reach of AI does not only encompass tactical optimizations but also encompasses tactical planning mandates. In financial management they use AI driven systems to consider the market trends, know the risks likely to prevail, and make the best allocation for financial portfolios. According to Nguyen et al., (2020), they noted that firms that deployed AI for investment decisions had superior returns and less risk to fluctuations in market conditions than general approaches. These examples serve to illustrate how AI can introduce accuracy and an element of the strategy of decision making into various fields.

The three fundamental facets of decision quality encompass accuracy, time, and relevance will help analyze how AI utilization affects organizational results. Precision relates to the extent of correspondence between the decision made and facts as well as the actual objectives. Workflow relates to the decisions made and time it takes to implement those decisions. Use of AI in

organizations means that data can be processed in real-time hence a firm can quickly respond to new challenges or take advantage of new opportunities without waiting for the information bottleneck. Practicality has to do with the effectiveness of a given decision in relation to certain goals or issues in an organization. Due to the ability of insights to be contextualized to the problem, AI guarantees that taken decisions are executable and effective.

However, there are issues that come with integration of AI, particularly when it comes to maintaining standard decision making quality. There is one, however, data reliance; an AI model thrives based on the quality of data given to it. The insufficiency of, errors, or even bias present in small data decisions can be generic, hence, considerably negatively affect result. So, the authors Byrnjolfsson et al., (2020) point out that firms with degraded or dispersed information technology infrastructure essentially do not get the benefits of AI, producing information that is noise or potentially misleading.

Other barriers mean that AI does not independently correlate to decision quality, as algorithmic biases are issues. These biases occur when the datasets used to develop the fully autonomous AI systems are derived from an environment polluted with bias. For instance, many are focused on algorithms used in the recruitment of employees such that they have been labeled as having negative impacts in favor of women and the minority employees (Raghavan et al., 2020). The former distorts organizational decision making processes by embedding unintended and frequently unethical biases into decision making.

There is a danger that businesses overestimate the possible benefits from AI systems and, in their efforts to emulate them, restrict human monitoring and judgment-making. As beneficial as it is to think of using AI for judging, it is still a flawed solution because of a lack of contextual knowledge of the decisions to be made, and more importantly, an absence of ethical compass inherent to human judgment. Binns (2018) also notes the ‘black box’ issue that stands for the inability of those decision makers to use algorithms to explain or justify outputs. This lack of certainty can certainly prejudice people against the use of AI, and render it unusable in decision-making, especially where such decisions are critical.

Ethical issues also affect the input of decisions in the use of AI in a particular process. Hence AI’s effectiveness and accuracy, they must ensure the larger organizational goals cut across equity, responsiveness, and social justice.

Decision quality as used in this research serves as a dependent variable that captures the extent of efficiency of organizational decision making. Making decisions in an organization has the potential to be enriched by AI integration thereby mitigating cognitive biases and operationally inefficient processes within an organization to give accurate, timely, and relevant results. These benefits, however, are realized with a number of drawbacks to which include data quality problems, algorithm bias, and ethical concerns. When organizations start to incorporate AI into decisions, the right proportion should be achieved between AI strengths and the kind of weaknesses it possesses. This ensures not only that decisions made align with existing specific goals and objectives, but also contains characteristics amenable to sustainable, ethical, and inclusive development

Data-Processing Capabilities: The Mediating Variable

Data-processing capability denotes an organization’s capacity to collect, store, analyze and interpret big data accurately and rapidly. It is an inescapable skill that has to be inculcated in light of present day data centered corporate landscape that requires AI technologies to have quality and availability of data. It means that the capability for data processing defines, therefore, the reliability and usefulness of the information obtained from AI systems. As observed by Chen et al. (2012), the acquisition steps and subsequent data processing elements that underpin all contemporary AI implementations are constructed from such modules. The fact that increased

depth of processing has become necessary in contemporary organizations is illustrated by the incorporation of complex systems including cloud storage platforms, machine learning libraries, and real-time stream processing platforms. If the data-processing prowess is weak, the AI systems would inevitably provide weaker performance, hence provide inferior information that deceives the decision-making socket.

Data-processing capabilities are pivotal in a bridge between AI integration and enhanced decision quality. The success of AI deployments for any organization relies on the power of the infrastructure of the data itself. Advanced systems that can collect, store, and process data without any hiccups create the ability for AI to generate actionable insights; this, in turn, enables organizations to make intelligent decisions. Big data analytics, cloud computing, and machine learning are an ensemble of technologies that rewrite the rules for corporate entities to utilize data in the correct and timely feeding of information in AI applications. Organizations devoid of proper data-processing frameworks face problems such as a fragmented system of data management, inconsistent quality of the same, and slow processing that hamper the effectiveness of AI solutions. The role of data-processing capabilities mediates the key difference: data-processing capability is what makes the big difference and determines whether integrating AI makes a substantial improvement to organizational outcomes or adds mere complexity, not value.

This will also come most clearly into view when considering organizations that have greater versus lesser capabilities in data processing. The organizations that invest in advanced data infrastructures are in a better position to unlock the full potential of AI, improving their operational efficiency and the accuracy of decision-making considerably. Such organizations use real-time data analytics and predictive modeling to anticipate market trends, optimize supply chains, and personalize customer experiences. Conversely, while others do struggle with limited data processing capability and find they mired in the swamp of previous technologies, silos, and inefficient workflows, thereby finding a quite difficult integration with AI. This disparity underlines the strategic role which should be played by data processing for enabling AI-driven transformation.

This mediation effect of data-processing capabilities is even more pronounced when considering the divergent outcomes of AI integration in high- and low-capability organizations. In other words, for organizations with strong data systems, AI acts like a transformative tool, magnifying decision-making processes. High-capability organizations use real-time data analytics to respond promptly to changing market conditions and make timely and precise decisions. For example, in the retail business, companies with the best data-processing systems now utilize AI to study consumer preference and buying behavior for highly targeted marketing strategies that yield a more satisfactory and loyal customer.

Conversely, companies with low capabilities tend to have huge barriers in properly integrating AI. The key challenges involve inconsistent data quality, the absence of centralized repositories for storing data, and a limited analytical talent base. But in practice, these challenges prevent an organization from maximizing use value from AI, making outputs suboptimal. At worst, in this situation, AI analytics will spit out either irrelevant or misleading insight to none other than decrease an organization's capability to make an informed decision. In fact, that is in vivid contrast to the critical mediation data-processing capability plays in mediating success or failure associated with attempts at organizational assimilation of AI capabilities.

The ability of data processing in retail has really revolutionized the way companies used to communicate with their customers. Big Data analytics allow retailers to extract and analyze an enormous customer dataset, from purchase history down to browsing behavior and socio-demographic form. Conjointly with AI applications, this information is woven into actionable

insights that personalize marketing strategies. For instance, retailers can offer personalized product suggestions, effective promotions, and dynamic pricing models that reflect the preference of a particular customer. Huang and Rust (2021) also note that these applications enhance not only customer satisfaction but also revenue generation and brand loyalty. In such a context, the retailers are able to hold a competitive advantage in a vast digital marketplace with the help of advanced data-processing tools.

In the financial sector, it is the capability of underlying data processing that enables the development of sophisticated AI-driven risk management systems. Financial institutions apply high-level risk models, supported by AI, to large databases of market trends, economic indicators, and historical transaction records to enable organizations to predict market volatility, determine credit risks, and optimize investment portfolios. Also, Nguyen et al., (2020) add that AI incorporation in financial decision-making processes aids with greater efficiency and speed for these decisions and therefore grants more confidence to the institution towards competitive directions within markets. This is such that even an algorithmic trading system should be using real-time analyses of trends to perform precisely those trades that would better ensure the returns are maximal but with lesser risks. These applications, without the power to process large amounts of data rapidly, would not be able to handle the volume and speed of financial data and would not be able to identify either opportunities or exposures to risks.

In healthcare, a combination of AI with ability to process large volumes of data is proving transformative to both patient care and medical research. Advanced analytics can integrate multiple data sets such as electronic health records, genomic data, and even real-time patient monitoring. All these pieces of information are fed into AI algorithms, which pick out patterns, predict outbreaks of certain diseases, and come up with personalized treatment plans. For example, predictive analytics tools use patient data to identify those who are more likely to develop chronic conditions so that early interventions may be made to improve outcomes. Besides, data-processing capabilities are important in large-scale clinical trials by streamlining the processes of data collection and analysis to help the fast development of new therapies. While success in these initiatives depends on how efficiently data is processed and analyzed, data-processing capability is at the very core of healthcare innovation.

Data-processing capability mediates in integrating AI within organizations and allows for efficient collection, storage, and analysis of data; thus, they determine the degree to which AI will be able to provide actionable insights that enhance decision quality. The disparities observed between high and low-capability organizations underpin the transformative potential of robust data systems-investing in advanced data-processing capabilities is very much a strategic imperative as industries continue to adopt AI-driven solutions.

Organizational Culture as the Moderating Variable

Organizational culture refers to the values, beliefs, norms, and practices that describe how organizational members behave and relate. It sets the identity of an organization and defines how members respond to challenges both internally and externally. According to Schein (2010), organizational culture is a dynamic construct that evolves from shared experiences and leadership influences. Cultural characteristics are very instrumental in the organization concerning the integration of AI. While the culture of innovation, collaboration, and adaptability provides fertile ground for tapping into the potential of AI, rigid, hierarchical cultures resist change and slow down the adoption and use of AI technologies.

Organizational culture is the moderating variable that influences how the integration of AI affects the quality of decisions and, therefore, organizational outcomes. It mediates employee attitudes, behaviors, and interactions and hence¹⁰² impacts the entire implementation process. A supportive culture will enhance the likelihood of enthusiasm in the adoption of AI tools since

employees perceive such technologies as enablers, not threats. On the other hand, more resistant cultures may amplify skepticism and even fear, leading to underutilization or outright rejection of AI technologies.

According to Kotter (2012), the approach of leadership is very important in shaping a given culture's attitude toward technology transformation. Leaders championing innovation and working toward a positive narrative about AI can create a supportive environment for change. For instance, transparent communication of AI-related benefits, complemented with well-placed investments in training and development, helps alleviate irrational fears, thus leading to smoother adoption. This effect of moderation finds a suitable context in all large-scale digital transformation efforts in any organization, wherein the cultural substratum either accelerates or delays progress.

An enabling culture encourages experimentation, innovation, and collaboration. These characteristics create an environment where employees feel empowered to explore new tools and methodologies, including AI technologies. A very good example is Google, whose organizational culture thrives on the principles of creative freedom and teamwork. This sharing of ideas, testing of hypotheses, and rapid iteration encourage employees to help the company continue leading in AI innovation. A culture of this kind does not only support the adoption of AI but also maximizes its potential through continuous improvement and shared learning.

On the other hand, the more formal and rigid structures of the organizational cultures are characterized by significant hurdles to the use of AI. Such cultures are generally suspicious of new technologies and are very averse to deviations from the standard behavior. According to Raghavan et al. (2020), it should be admitted that there is a stronger resistance from the culture in which such hierarchy is quite evident, in sectors that would naturally embrace machine learning and AI approaches deep-down such as traditional manufacturing or service sectors, the AI will be regarded by the working talent as a factor capable for posing risks to certain job roles or creating unnecessary unease to the usual channels of work. This resistance may include avoidance of the AI tools, lack of commitment to training sessions and actual defiance of change within the organization.

For example, the highly centralized organizational culture may slow down decisions made regarding AI implementation due to the bureaucracy decisions require extensive approvals or may fail to secure consensus among leaders. Frigidity in culture not only prolongs implementation time, but also reduces the ability of AI to improve decision-making and productivity.

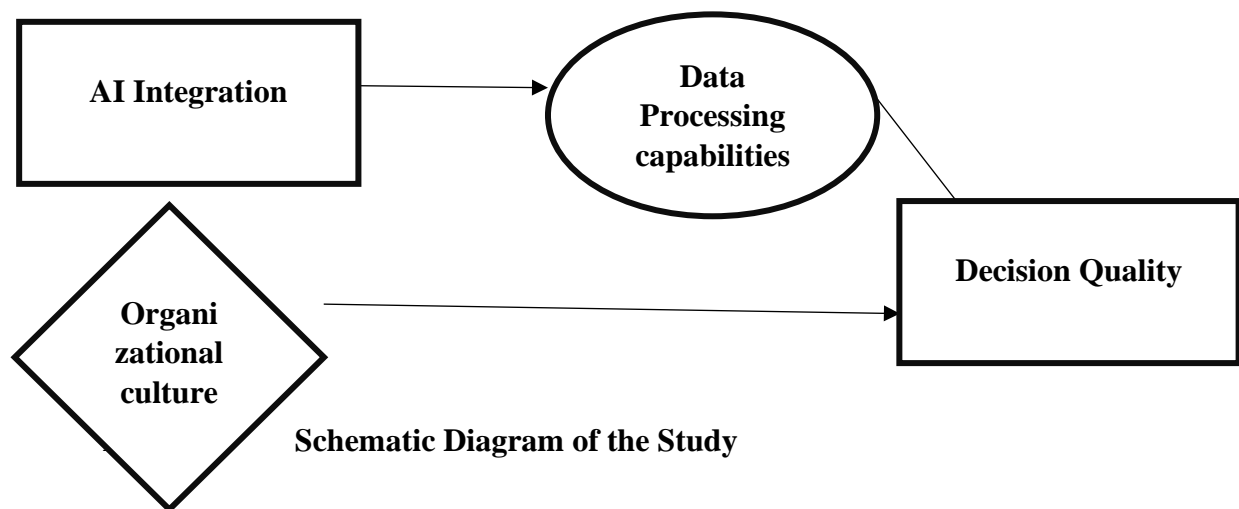
The current challenge is to provide education that brings awareness of AI and implements it throughout the company. Training should better provide an understanding of AI, speak about advantages, and demonstrate use cases. This would assist organisations to decrease the fears when it comes to the use of AI devices and make the employees gain some level of confidence when using the AI tools. This shows that there are good ways to fight the resistance from employees when it comes to decision making concerning the integration of AI. While using participatory approaches one is given a chance to express ones concern, feedback information or ideas and so that is why they are more participatory in nature. This works also assists in building credibility and makes certain that the aspirations of the work force are in consonance with the goals of the AI programs to be instituted.

It means that the AI implementation successes at the initial stages can spur employees. Real-life case of achieving tangible value proposition like increased return on investment or better customer satisfaction serves as a testimony about continued reliability of AI tools. Recognizing success within the organization on social media¹⁰³ platforms is another way of driving home the point that AI is a valuable tool within the company and not a threat. Managers are the gatekeepers

of top-down AI implementation and bringing into practice what is not practiced to showcase to the employees that refer to change as an innovation process. The higher the leadership commitment, the higher the chances of the initiative to be seen as a strategic agenda of change that fosters organizational co-ordination and integration.

Organizational culture moderates the relationship between AI integration and its consequences on decision quality. The supportive cultures of innovation, collaboration, and adaptability enable organizations to realize the full potential of AI technologies, while resistant cultures prevent the adoption of such technologies and hence reduce the effectiveness of AI initiatives. By fostering a supportive culture through training, participatory decision-making, and leadership advocacy, organizations can overcome resistance and create an environment conducive to successful AI integration.

Schematic diagram



Methodology

Population

The population includes all the organizations using and AI technologies in decision making across Pakistan.

Target population

The target population in this research comprises employees in organizations that have integrated AI technologies into their decision-making processes across various industries. This will ensure generalizability across diverse organizational settings. Some examples of industries include finance, healthcare, manufacturing, and retail.

Accessible population

Given the practical constraints, the target population was narrowed down to employees in organizations that were AI-integrated and had offices in cities, since the prevalence of such technologies is higher there. This also restricted participation to employees in managerial or supervisory positions because they are immediately involved in decisions made under the influence of AI systems.

Sampling strategy and Sample size

We will use non probability convenient sampling technique. The study targeted a sample size of 200 employees for the statistical validity, which provided 125 responses to analyze.

Inclusion criteria

Employment in AI-Integrated Organizations

Respondents must be employed by organizations that have actively integrated AI technologies, such as predictive analytics, natural language processing tools, or robotic process automation, into their organizational decision-making processes.

Accessibility to Organizational Decision-Making Processes

Participants must be part of teams or workflows whose decisions are driven by insights derived from AI technologies.

Exclusion criteria

Work in Non-AI Organizations

Only exclude those individuals who work within an organization that does not integrate AI tools for decision-making; otherwise, responses would not go along with the rationale of the study.

Low-Level or Non-Decisional Positions

Individuals occupying low-level or non-decisional positions are also excluded. They may either not make decisions at all or interact with the AI systems only to execute routine work or entry-level tasks. Excluded are those respondents who are not very conversant with how AI systems influence organizational decision-making for the purpose of maintaining the validity of responses.

Temporary or Freelance Employees

Excluded are temporary workers, contractors, or freelance employees who are not very integrated into organizational structures of decision-making. This is because their involvement with AI systems may be peripheral.

Research design

The research is formal as it systematically defines connections between AI integration, decision quality, data processing capabilities, and organizational culture. Conceptual frameworks, theoretical postulates and quantitative analyses back up these relationships. Further, the study entails relational aspect by engaging the participants through the formatted interview schedule that records their sentiments, emotions and attitudes towards the effect of Artificial Intelligence on decision making frameworks.

The study uses an ex post facto design, capturing the effects of integrating AI after the event without necessarily manipulated variables. It also contains a description aspect, which seeks to provide a snap shot on the state of integration in participating organizations, decision-making capacities of integrated AI, data processing features and organizational culture. Moreover, the study aims at identifying whether there is causality, that is, the effect of integrating AI in decision-making quality, mediated by data processing in organizations and culture, respectively.

The study is cross-sectional since data is obtained at one particular time with regard to the variables in question. It also belongs to quantitative research, as it examines the relationships between the variables and works with hypothesis testing by using the tools of the SPSS program and the PROCESS model. Taking place in the field, the research collects information from employees in their workplaces (buffer zone). The attention is paid to decision-making in real practice of organizations' activity where AI is already introduced.

Data Analysis

Table 1- Demographics- (Descriptive Statistic)

		Numbers	%
Gender	Male	62	50%
	Female	62	50%
Total		124	100%
Age	15-24	44	35.5%
	25-34	50	40.3%
	35-44	22	17.7%
	45 and above	8	6.5%
Total		124	100%
Job experience	1-3 years	42	33.9%
	3-5 years	26	21%
	Less than 1 year	43	34.7%

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	More than 5 years	13	10.5%
Total		124	100%

From Table 1, it is illustrated that the number of respondents both male and female are equal (N = 62, 50%). Regarding age, most respondents were between 25-34 years old (N = 50, 40.3%), followed by 15-24 years old (N = 44, 35.5%). Moreover, most respondents had less than one year of job experience (N = 43, 34.7%) followed by the respondents who had job experience between 1-3 years (N = 42, 33.9%). Very few numbers of respondents were replied with more than 5 years of experience.

Based on demographic data, the respondents are equally split between males and. Most are young adults, with the majority having less than 1 year of job experience, reflecting an early-career demographic.

Table 2 – Reliability Analysis

Variable	Cronbach's alpha	No. of items
AI integration in decision making	.849	5
Data processing capabilities	.815	5
Organizational culture and AI integration	.809	5
Decision quality	.958	2

Table 2, the result shows the reliability of the variables where all the Cronbach's α value is above the acceptable level of .6 as suggested by Nunnally (1978). For AI integration in Decision Making the reliability Cronbach's α was .849 with 5 items. The assessment of the access and control showed a high reliability coefficient estimated to be .815 over the 5 items of data processing capability. Organizational culture and integration of artificial intelligence also formed good internal reliability with a Cronbach's α of .809 and consisted of 5 items. With a Cronbach's α of .958 across the 2 items of decision quality, this variable had the highest reliability.

Regression Analysis (PROCESS HAYES MACRO v4.2)

Outcome Variable: Decision Process Clarity (DPC)

The regression model predicting DPC from IIDM was statistically significant, $F(1,122)=7.68, p=0.0064$ $F(1,122) = 7.68, p = 0.0064$, with an R^2 value of 0.0593. This indicates that 5.93% of the variance in DPC was explained by IIDM. IIDM was a significant positive predictor of DPC ($b=0.2304$ $b = 0.2304$, $SE=0.0831$ $SE = 0.0831$, $t=2.77$ $t = 2.77$, $p=0.0064$ $p = 0.0064$), with a 95% confidence interval (CI) ranging from 0.0659 to 0.3950. The standardized regression coefficient for IIDM was $\beta=0.2434$ $\beta = 0.2434$, suggesting a moderate positive effect.

Outcome Variable: Decision Quality (DQ)

The regression model predicting DQ from IIDM and DPC was significant, $F(2,121)=22.25, p<0.001$ $F(2,121) = 22.25, p < 0.001$, with an R^2 value of 0.2689. This means that 26.89% of the variance in DQ was explained by IIDM and DPC collectively. IIDM had a marginally significant positive effect on DQ ($b=0.2043$ $b = 0.2043$, $SE=0.1076$ $SE = 0.1076$, $t=1.90$ $t = 1.90$, $p=0.0598$ $p = 0.0598$), with a 95% CI of -0.0086 to 0.4173. DPC was a significant positive predictor of DQ ($b=0.6521$ $b = 0.6521$, $SE=0.1136$ $SE = 0.1136$, $t=5.74$ $t = 5.74$, $p<0.001$ $p < 0.001$), with a 95% CI of 0.4272 to 0.8771. The standardized coefficients were

$\beta=0.1523$ \beta = 0.1523 for IIDM and $\beta=0.4600$ \beta = 0.4600 for DPC, indicating that DPC had a stronger effect on DQ. An additional regression analysis was performed using IIDM and OCAI (Organizational Culture Assessment Instrument) as predictors of DQ.

Model Summary

The model was significant ($F(2,121)=52.80, p<0.001$ $F(2,121) = 52.80, p < 0.001$), with $R^2=0.466$ $R^2 = 0.466$, indicating that 46.6% of the variance in DQ was explained by IIDM and OCAI.

Coefficients

OCAI was a significant positive predictor of DQ ($b=0.879$ $b = 0.879$, $SE=0.093$ $SE = 0.093$, $t=9.48$ $t = 9.48$, $p<0.001$ $p < 0.001$). IIDM was not a significant predictor ($b=0.115$ $b = 0.115$, $SE=0.093$ $SE = 0.093$, $t=1.24$ $t = 1.24$, $p=0.218$ $p = 0.218$) in this model.

Collinearity Statistics

Both predictors showed acceptable tolerance levels (0.925) and variance inflation factors ($VIF = 1.081$), indicating no multicollinearity issues.

Discussions

The results of the present study support the potential of applying AI approaches to organizational decision-making when combined with sound data processing technologies and favorable organizational cultures. AI integration boosts decision quality due to increased accuracy, decreased human error, and time and space relevance of decisions. It also shows that data processing capacity is a key mediating variable in the workings of this relationship and that organizational culture is a moderating variable.

The regression analysis results reveal that AI integration has a positive, though moderate, effect on decision clarity and subsequently has a significant, direct effect on decision quality. These results support previous literature discussing the role of AI in reducing the time and effort needed for high-stakes decision-making by providing analytical and real-time results (Russell & Norvig, 2021). For example, organizations with well-developed data systems could effectively use AI.

Surprisingly, the impact of AI integration for decision quality was moderate when direct but significantly enhanced when moderated by decision clarity and data processing. This suggests that the ultimate purpose of integrating AI remains achievable when companies consider investing on quality databases. No organization wants data that is inaccurate, unrepresentative or obsolete to be feeding into an artificial intelligence program. In addition, the positive direct effect of organizational culture on decision quality examined in this study underscores the relevance of developing contexts that engender innovation and flexibility. This was especially so if the supporting organizational culture was evident whereby the improvement was scaled up by a further 5 percent in accordance with Kotter (2012) the author noted that culture supports the initiation of technology.

The work also highlights some of the issues that are linked to the implementation of AI, including the reliance on data quality, and the dangers of algorithmic biases. Such factors can greatly challenge decision quality particularly in organizations with weak or incomplete decision-support infrastructures.

Limitations and Suggestions

This paper was a worthwhile endeavor that offered much insight into the effects of AI on decision-making in organizations; however several factors have to be mentioned in order to define the further scope of the study. Initially, the study applied a cross-sectional research design, which only collects data at a specific moment in time. Although it supplies an overview of the relationship between the degrees of AI integration, the quality of decisions made, data processing abilities, and organizational culture, it lacks the possibility of attachment of cause-and-effect

relationships. More research has to be conducted to analyse patterns of these relations in more detail and to examine the long-term effects of the application of AI on decision-making.

Secondly, convenience sampling has mainly targeted the superintendents and other higher-level employees, including urban organizations in Pakistan, which limits the generalizability of the formulated hypothesis. It is probable that organizations from rural settings, or with different levels of automation and digitalization, or with operations in different cultural worldviews, will have different patterns of AI use and impact. The sample's specification to employees only would have limited the depth of understanding. There is the need to extend the sample across organizational strata, different industries and regions.

Third, the study results were based on the self-reported data obtained through structured questionnaire, which has limitation of social desirable and recall bias. The AI systems and the respondents' organizations may have elevated the perceived organizational culture regarding AI systems to meet the hypothesized norms. Succeeding studies should include quantitative parameters, including performance results and physiological observation, along with the subjective answers. Further, despite the cross-sectional nature of the work, the study analyzed organizational culture as a moderator, but did not explore specific cultural characteristics or subcultures that could specifically affect the innovation of AI, including the innovation orientation, risk-taking propensity, or levels of collaboration. Being nature of the culture, existence of these dimensions could potentially explore other yet unknown or complex relationships between culture and technology adoption.

Toward that end, organizations and researchers can take these specific steps. More longitudinal approach to the research methodologies should be adopted to fathom temporal and extended impacts of AI integration to decision making. Sampling a large and diverse population or cross-industry, cross-geographical, and cross-organizational populations will also increase generality of the findings. Using algorithmic audits on the organizations, there is a need to enhance practices in ethical AI reducing biases in algorithms. To fully unlock advantage from AI, organizations should improve the data-processing capacity as a result of investments in better and more efficient analytics tools and cloud services. One of the crucial actions is also the cultural growth which means leadership training, employees' awareness and AI early wins to gain trust and engagement. These will not only overcome the shortcomings but also provide the basis for further comprehensive and applicable research on the nature and implications of change enabled by AI in organizational decision stakes.

Conclusion

Based on the findings of this research, it is recommended that AI be incorporated into organizational decision processes to a great extent as the use of this technology enhances decision quality by increasing accuracy, speed and relevance of decisions. AI relieves an organization of errant decisions by people while offering more accurate results from data analysis. However, the success of AI integration is heavily influenced by two critical factors: data processing and other functions as well as the organizational culture of corporations. Organization data processing systems act as a buffer in determination between the degree of AI and the quality of decisions made. On the other hand, organizations with scattered or limited data infrastructures are not likely to reap all the gains of AI because poor data quality limits AI.

Organizational culture is a second level moderator whereby; positive organizational culture and /or innovative boosts the positive impact of AI on decision making. When the organizational cultures promote collaboration, flexibility, and creativity while working, more

employees will have Confidence in the AI systems. Conversely, a rigid culture slows down the technology by constraining its capability to enhance the decision outcomes.

From the pragmatic viewpoint, the outcomes underscore the need for organizations to acquire improved structures for the processing of quantitative data, including analytical tools and cloud solutions. To support the growth of AI it is essential to extend leadership development, knowledge sharing, and other approachable organizational culture strategies as well. Such endeavours can assist organisations to mirror their approaches to the potential of change offered by AI in order to boost their decision-making abilities.

This research also adds to the body of knowledge by proposing a conceptual model that examines the relationship between AI integration and decision quality while controlling and data-processing capacity and organizational culture. As much as the study shows that AI has the potential to bring a revolution, the same study shows that culture and infrastructure plays a critical role when it comes to implementation of the AI. In addition, AI should be considered a strategic change within organisations that need not only consider its implementation but also its ethical implications and ongoing refinement to enable optimal utilization of AI when making decisions.

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Examining the Frequency Movements of Government Domestic Debts

Abdul Aziz Khan Niazi

Department of Management Sciences, New Campus,
University of Engineering and Technology, Lahore, Pakistan

Tehmina Fiaz Qazi

Hailey College of Banking and Finance
University of the Punjab, Lahore, Pakistan

Suleman Sami Qazi, (Corresponding Author)

Department of Electrical Engineering,
University of Engineering and Technology, Lahore, Pakistan

Abstract

The variation in government domestic debt is one of the area of high concern for Pakistani and international communities, therefore, the study is aimed to examining the frequency movements of government domestic debts for the last thirty years. The design of the research study contains findings of survey and review of current literature, data collection and signal analysis following positivist research philosophy, and deductive research paradigm. The data of government domestic permanent debt, floating debt, unfunded debt, foreign currency loans, total debt, and government domestic liabilities for period of the last thirty years. The method of analysis employed is wavelet transform using MatLab software. This is real data based original study that provides reliable results. The findings of the study are very useful for Pakistan government, international institutions, academia, economists, and analysts. It provides a lot of information and insights to lenders as well. For research community it provides foundations for future research.

Keywords: Government Domestic Debt, Government Debt, Wavelet Transform, Wavelet Analysis, Pakistan

Introduction

Government debt has become imperative in current economies because it fulfills the demands of funds to support the government's efforts to reduce deficits, meet growing interest costs, support key government investments at risk (from time to time), generate economic opportunities, and respond to crises. It protects essential safety nets and builds the fiscal foundation for economic growth. It is a reliable and easier way to meet these types of government needs. Xing, Xu, & Wang, (2024) asserted that open government data helps in reducing information friction in imperfect markets and generates real economic value. Acharya, Rajan, & Shim, (2024) argued that government myopia increases a country's access to borrowing (external). It also extends government's effective horizon to give incentives to private production. Li, et al. (2024) bolstered that admin intervention suppresses pricing penalty of extreme low temp on domestic government debts. Strong, (2024) concluded that longer political government tenures are correlated with weaker abilities to influence domestic government debts. Yu, et al. (2024) asserted that crowding-out effect of domestic political government debts on commercial credit financing of firms is more noticeable in regions where credit market regulation is comparatively feeble. Despite of utmost importance domestic the public debt has gone largely unnoticed in contemporary literature (Guidotti, & Kumar, 1992).

Admittedly, the phenomenon of government debts is that of high importance for financial analysts, academia and researchers but despite of its high importance hardly any study could be found that addresses the issue of examining the government debt levels in different political regimes in Pakistan and that to relate to the international financial crises. There is a gap in literature to this extent in the context of Pakistan. There is a dire need of examining the ups and downs of levels of domestic debts of Government of Pakistan over the period of time against different political and crisis regimes. Therefore research objective is to examining the frequency movements of government domestic debts for the last thirty years. To achieve the objectives of the study the authors considered many methods to analyze the issue like that in Qazi, et al., 2023; Tariq, et al., 2023; Qazi, Niazi, Mirza, Basit, & Saleem, 2023; Farid, et al., 2023; Shaukat, et. al., 2023; Aziz, et al., 2023; Niazi, et al., 2023; Niazi, Saleem, Basit, Iqbal, & Khan, 2023; Niazi, Qazi, Aziz, Basit, & Niazi, 2023; Qazi, Niazi, Mahmood, Basit, & Niazi, 2023; Naeem, Muhammad, & Niazi, 2021; Ali, Mushtaq, Niazi, & Raza, 2021; Basit, Qazi, & Khan, 2021; Qazi, Niazi, & Basit, 2020; Faraz, Niazi, & Zafar, 2020; Niazi, Qazi, & Basit, 2019; Basit, Niazi, Qazi, & Imtiaz, 2019; Niazi, Qazi, & Basit, 2019; Haq, et al., 2018; and Basit, Qazi, & Niazi, 2020. ANN, CAMELS Model, CoCoSo, GRA, IPA Analysis, Lexico-Graphic Method, Wavelet Analysis, Multi-Attribute Decision Making, MOORA, VEC, etc. are considered and it is found that wavelet transform is the best choice to meet the objectives of the study. Therefore the study uses wavelet transform as the research methodology. Wavelet analysis used in wide variety of fields like medicine (Qassim, et al.2013; Hassan, et al. 2010; Scholkmann, & Dommer, 2012), geophysics (Liu, Hsu & Grafarend, 2005; Zamani, Samiee & Kirby, 2013; Grinsted, Moore & Jevrejeva, 2004), astrophysics (Li, Gao & Zhan, 2009; Bloomfield, et al. 2004; Donner & Thiel, 2007; Kelly, et al. 2003) etc. It is also frequently used for research in the field of neuroscience, wind engineering, industrial aerodynamics, finance, biology, medicine, economics, meteorology, energy, computer science, engineering, electronics & telecommunication, management sciences, social sciences, acoustics, geodynamics, laser physics and nuclear science, signal processing, engineering, medical sciences, astronomy, project management, energy, manufacturing, engineering, research and development, insurance, oil & gas, transportation, geology, geo-physics, oceanology, music, and environmental science. Different wavelet variants (e.g. CWT, WCOH, XWT and WCA) to analyze the co-movements between the pairs of variables and pairs of entities are used for investigation of relationships and movements (Crowley & Mayes 2009; Rua & Nunes 2009). Remaining article is arranged as section 2 (briefly reviews the related literature), section 3 (research methods), sections 4 (analysis, results and discussion) and section 5 (conclusion), respectively.

Literature Review

The literature review provides context, identifies gaps, and prevents any duplication, therefore a detailed literature survey is conducted. The study explored online research databases like Ebscohost, Frontiers, MDPI, PLoS, Wiley, Taylor & Francis, Springer, Emerald, Elsevier, JStor, etc. using keywords government debt, government domestic debts, Pakistan government debt, public debt, etc. As a result, many articles are found, downloaded, and critically examined and the highly relevant studies are reported here to set the very outset of the current study. Likhonosova, (2024) asserted that conditions of imbalance of demand & supply, management of financial debt requires the strategy for investments. Smith, & Mendoza-Velázquez, (2023) argued that the public managers need to hedge the political, economic, and financial risks. Zhang, Chen, & Wang, (2024) bolstered that the growth in government debt is attributed to the current financial and economic mechanisms. Afonso, Alves, & Monteiro, (2024) revealed that increase in sovereign risk raises the domestic banks' portfolio of local government debt and reduces holdings of central banks.

Yang, et al. (2024) argued that there is a significant positive-relationship between local government implicit-debt and regional financial market spillovers. Yao, et al. (2024) disclosed that local government debt significantly reduces firm tax burden. Cao, Duan, & Ibrahim, (2024) concluded that commercial banks are showing increased preference for local government bonds expecting steadfast financial instruments. Si, et al. (2024) argued that better government debt management helps to promote corporate cross-border mergers and acquisitions. Nie, et al. (2024) argued that the accumulated local government debt changes local governments' fiscal behavior. Jing, et al. (2024) bolstered that high government shareholdings local-fiscal pressure, and low-economic-development pressure weaken regulation's impact on banks'. Zhang, et al. (2024) concluded that current research is mainly based on normative theory, and there is hardly any empirical study on the impact of inspection on government debt risk. Mwakalila, (2024) asserted that increasing government borrowing from local banks precludes the trickle-down effect of the monetary policy rate on banks' lending rates. Tian, et al. (2024) argued that high domestic government debt restricts land pricing & land-use efficiency. Peng, & Lin, (2024) asserted that domestic government debt significantly affects corporate financing, that exacerbates corporate financing issues, and resultantly it intensifies aggressive corporate tax avoidance.

Methodology

The study follows positivism as research philosophy, deductive approach. The design of the study is literature review, data attainment, and analysis. It is the case study of Pakistan. It uses the government debts' time series secondary data for obtained from central bank of Pakistan (i.e. dataset of monthly balances for last 25 years as shown below in Table 1). The method of analysis uses is wavelet analysis. The analysis is performed on MatLab software using wavelet tool facility in the software. Wavelet is zoom-in zoom-out process that is useful wave propagation, data compression, signal processing, pattern recognition, etc. Wavelet is used for getting frequency information of the signals through which one can have a look for better frequency resolution in approximation and detail coefficients. The study follows classical mathematical algorithm for the wavelet, continuous wavelets, and wavelet power spectrum. Wavelet has an exceptional potential to capture the non-stationary behavior and time-varying trends present in the time series data (Aloui & Hkiri, 2014; Aloui, et al., 2018; Aloui, Hkiri & Nguyen, 2016).

Analysis and Results

The authors obtained data from the Central Bank of Pakistan which is below in a skip table (Table 1). That complete dataset is available with the authors and can be obtained at request.

Table 1: The Dataset

Series Name	UNIT	30-Sep-19	31-Aug-19	-	-	31-Jul-95	30-Jun-95
Government Domestic Permanent Debt	PKR	12,834,134,340,000	12,567,450,070,000	-	-	272,743,900,000	272,232,700,000
Government Domestic Floating Debt	PKR	6,528,828,545,000	5,732,952,218,000	-	-	298,379,100,000	294,232,600,000
Government Domestic Unfunded Debt	PKR	3,280,150,055,000	3,188,091,194,000	-	-	227,300,000,000	223,323,800,000
Government Domestic FCY Loans	PKR	6,765,179,561	6,786,114,852	-	-	17,585,500,000	17,897,400,000
Government Domestic Debt	PKR	22,649,878,120,000	21,495,279,590,000	-	-	816,008,500,000	807,686,500,000
Government Domestic Liabilities	PKR	514,151,494,500	518,609,802,400	-	-	18,211,000,000	18,211,000,000

The scheme of analysis employs individual wavelet power spectrum transform that enlightens upon localization of the variations in the variables in frequency-time domains during the sample period. The sample period is June 30, 1995, to September 30, 2019 (the data of month balances). Figures 1-6 are contour diagrams there are three different variables presented on different axes and scales. On the x-axis months/years are plotted with inner ticks on forty-eight months each. On the y-axis, frequency is represented at a wavelet scale of 4-64. Whereas, the intensity is represented on the third dimension i.e. color scale (dark blue being low intensity to dark red being high intensity). One can observe the variations through color intensity over the sample period as against different levels of wavelet frequency. All spectra i.e. Figures 1-6 follow the same scheme of representation.

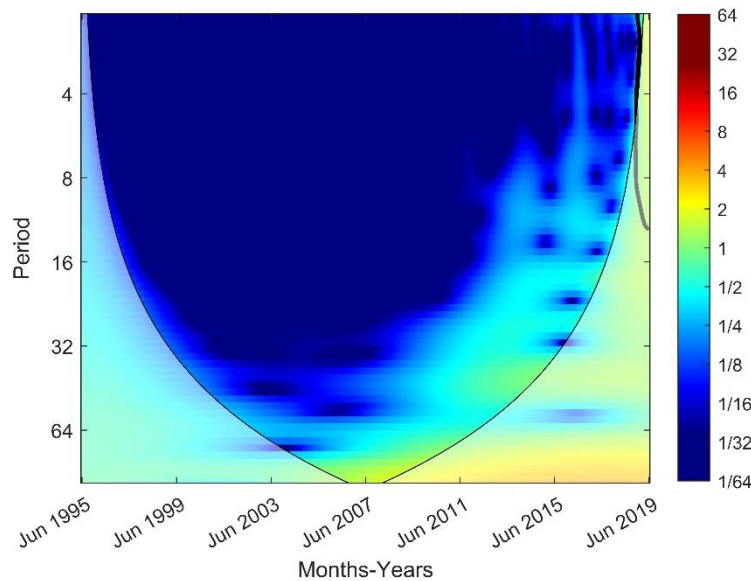


Figure 1: Wavelet Power Spectrum of Government Domestic Permanent Debt

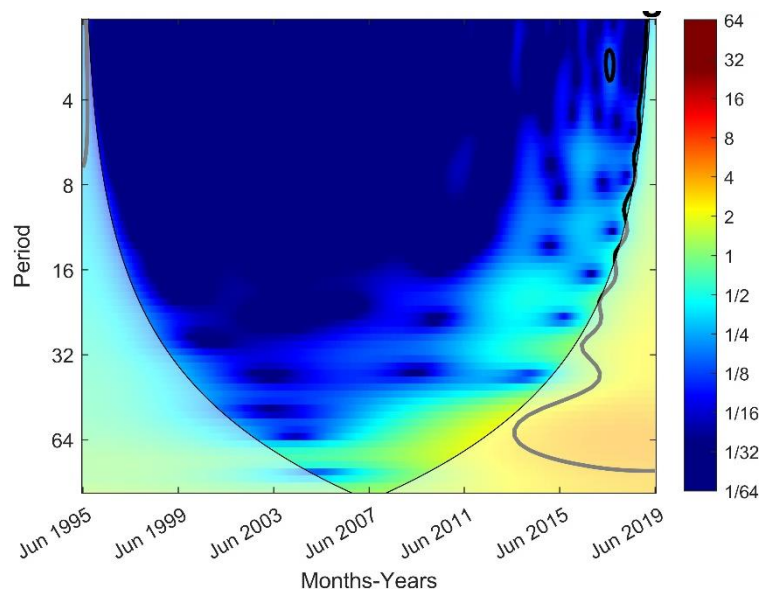


Figure 2: Wavelet Power Spectrum of Government Domestic Floating Debt

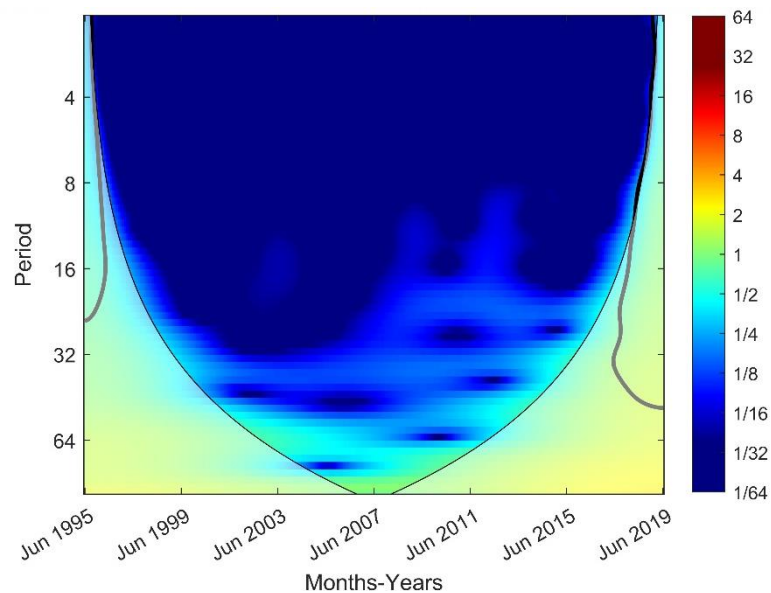


Figure 3: Wavelet Power Spectrum of Government Domestic Unfunded Debt

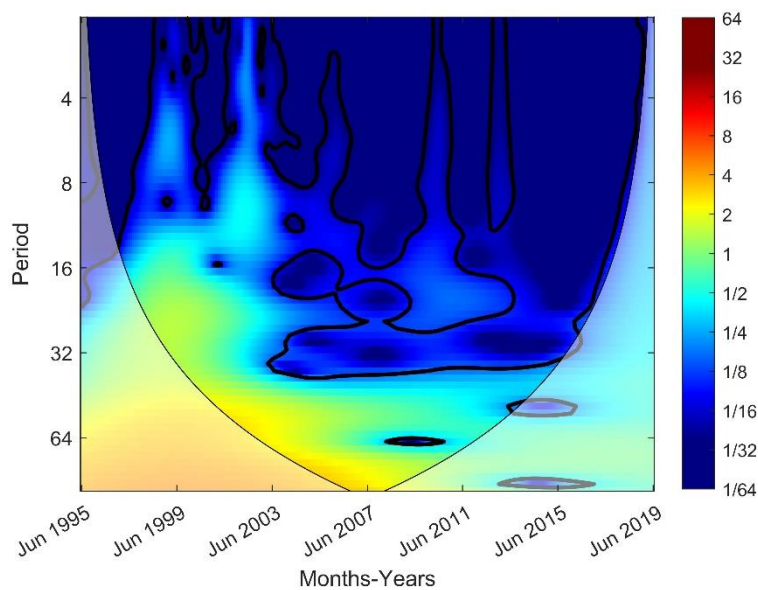


Figure 4: Wavelet Power Spectrum of Government Domestic Foreign Currency Loans

Figure 5: Wavelet Power Spectrum of Government Domestic Debt

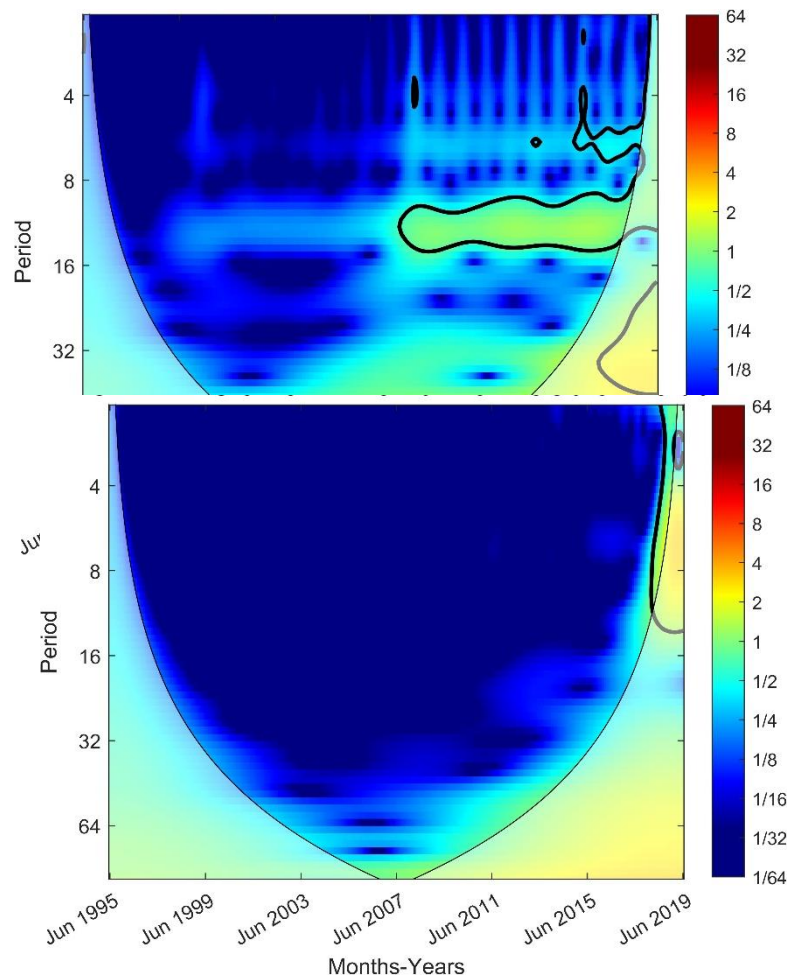


Figure 6: Wavelet Power Spectrum of Government Domestic Liabilities

From the close observation of the contour diagrams, one finds hardly black. The contour that encloses the edge effects is termed a cone of influence (COI). That encloses the region where the results of the transformation are unreliable. COI represents the lighter-shaded area i.e. 5% significance level that separates high-intensity regions from low-intensity regions. The wavelet power spectrum is compared with the study operations null hypothesis. It is achieved through Monte Carlo Simulation by phase randomized surrogate series. As a result, it can be observed that Figures 1, 2, 3, 5, and 6 have approximately similar patterns localized across the frequency and time domains. However, there are different patterns found in Figure 4 (Wavelet Power Spectrum of Government Domestic Foreign Currency Loans). One can find some regions enclosed with thick black contours throughout the sample period at mid and low-wavelet frequency showing low intensity at the color scale. One can also observe a similar type of contour ranging from the frequency at wavelet scale 8-16 and in the time domain from 2008-2015 moderate at color scale. Over the variable (i.e. government domestic permanent debt, government domestic floating, debt, government domestic unfunded debt, government domestic debt, and government domestic liabilities) except one (i.e. government domestic FCY loans) have similar

overall behavior. However, government domestic FCY loans have different patterns from the other variables

Discussion and Concluding Remarks

The study examines the frequency of variations of government domestic debts in Pakistan. It is one of the most important phenomena on the agenda of contemporary research. The research problem under investigation is analyzing the variations of government domestic debt both on frequency and time domains over the sample period. The method of analysis is wavelet transform (individual wavelet power spectra of variables). The variables under study (i.e. government domestic permanent debt, government domestic floating debt, government domestic unfunded debt, government domestic debt, and government domestic liabilities) except one (i.e. government domestic FCY loans) during the sample period (June 30, 1995, to September 30, 2019) have similar overall behavior. However, government domestic FCY loans have different patterns from the other variables. The study contributed wavelet power spectra of government domestic permanent debt, government domestic floating debt, government domestic unfunded debt, government domestic FCY loans, government domestic debt, and government domestic liabilities to the literature. The study has profound practical and theoretical implications since its findings are useful for individuals, institutions, and policymakers, offering more deep insights into the phenomenon. It is a preliminary study by the authors, therefore, the study also has certain limitations. Firstly, the dataset is limited to a relatively shorter time series. Secondly, the authors have only generated wavelet power spectra and intend to extend the analysis to create cross-wavelet transform and wavelet coherence transform spectra to have deeper insights. Thirdly, the study is based on a limited number of data observations from Pakistan therefore the generalization of results is accordingly restricted. Future studies may be designed by keeping in view to overcome the limitations.

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Use of Artificial intelligence in the banking industry (Case study of Pakistan)

Nayyab Zulifqar
UCP, Lahore

Abstract

This study investigates the adoption and impact of Artificial Intelligence (AI) in Pakistan's banking sector, focusing on three central banks: Some well-known banks include Habib Bank Limited (HBL), Faysal Bank, and Bank Alfalah. The purpose is to understand which and how the banking sectors' significant activities have been impacted by the development of AI technologies for customer service, operations, fraud detection, and risk management. These banks were selected for the study based on this criterion, and ten respondents were interviewed using a qualitative method of research by conducting semi-structured interviews with them to learn about the practicality and utilization of AI. The results suggest that AI has enriched operational effectiveness by integrating, standardizing, and implementing risk management and nonconformist identification mechanisms. Furthermore, self-service technologies such as AI-driven chatbots and virtual assistants have enhanced the existing customer experience by being faster and more personalized.

Nevertheless, the study reveals risks and drawbacks, which are twice as concerning as data privacy and insist on regulatory issues and the necessity for human resources to adjust to AI tools. The two central pressures, therefore, emerge as the need to develop new capabilities to work alongside AI systems on the one hand and concerns about automation on the other. The study implies that the banking industry stands to benefit tremendously from AI. However, there is the need to put in place measures that can facilitate its implementation and use while at the same time paying attention to ethical issues emerging from the use of AI, data protection, and training of human resources to enhance their compatibility to work with the new technology. This means Pakistan's banking industry must utilize the drive of AI, planning, and policies that must be established to prevent postcode over-reliance on technology and plan a beneficial quota for integrating the same.

Keywords: Artificial Intelligence, Pakistan banking sector, HBL, Faysal Bank, Bank Alfalah, operational efficiency, customer service, fraud detection, risk management, data privacy.

Introduction

Background: Evolution of AI and Its Global Influence on the Banking Industry

Artificial intelligence (AI) has evolved dramatically over the past few decades, transforming industries by automating processes, improving decision-making, and enhancing operational efficiency. AI has also found its place in the banking sector, making significant impacts towards innovations in customer relations, fraud, risk assessment and control, and bank operations. Maseke (2024) notes that advancements in AI have resulted in a steep uptake in using AI approaches in banking, such as machine learning algorithms, natural language processing, and robotic processing automation. These technologies have helped the banks process extensive data, do repetitive jobs, and offer services tailor-made to customers.

AI around the world has helped transform the operational strategy of banks regarding whether the risk assessment is deep and detailed in decision-making by cutting costs. For example, through AI technology in the development of chatbots and virtual assistants, more efficient customer interaction has been achieved due to the provision of round-the-clock service. In the

share of a developed economy, the crucial application of AI has been observed in fraud detection, in which, using a machine learning approach, the transaction behavior pattern is analyzed and scrutinized for any abnormal activity identified by Javaid (2024). However, as we have seen, with every opportunity that AI brings comes a pack of problems ranging from data security issues to workforce replacement. Again, as AL-Dosari et al. (2024) posit, other challenges include ethical concerns and cyber risk, which are also looming barriers, given that FI is heavily implementing AI.

Context of Pakistan's Banking Sector

The banking sector of Pakistan, though expanding at a reasonable rate, has specific problems associated with it, such as ineffective mechanisms, specific regulation policies, and, above all, the process of considering modernization. As a developing economy, Pakistan has always been a slow adopter of advanced technologies, but the need for innovation is emerging. Following Nawaz et al. (2024), the banking sector of this country has remained relatively immature in implementing sophisticated technologies such as artificial intelligence because of restricted infrastructural development, strict government rules and regulations, and inadequate capital investment in digitization. As competition increases, especially with the emergence of FINTECH organizations, regular banks within Pakistan are starting to appreciate AI's position on improving their services and competitiveness.

Several reasons have fueled the demand for Technological advancement in Pakistani banks. First, there is pressure from customers who expect organizations to deliver their services more quickly, competently, and tailored to their specific needs. Second, the threats of cyber-attacks and fraud have emerged; therefore, there lies the necessity to develop AI to enhance cyber security mechanisms (Iqbal et al., 2024). Third, tactical misalignments comprising ineffective systems have compelled banks to embrace AI to solve operational challenges. In the traditional banking system, Naeem et al. (2024) observed that AI can increase the banks' efficiency by efficiently managing the processes, triggering customer satisfaction, and cutting expenses. Still, there are those opportunities the banking sector in Pakistan needs to grab. However, it needs help with issues like data privacy or workforce introduction to AI technologies.

Problem Statement

It is essential to discern how AI impacts the country's banking industry since Pakistan is a developing economy with particular challenges. Unlike other regions in the world where banking adopts AI, the banking sector of Pakistan is still young in adapting to the technology. In their study 'AI Use Cases in Banking Industry,' Ahmed et al. (2024) stress that AI must be explored for the Pakistan banking industry as this technology holds promise for strategic industry issues, including inefficiencies, fraudulent activities, and dissatisfied customers. Still, the integration of artificial intelligence is accompanied by issues such as data and privacy and the displacement of the workforce and compliance, which is a significant issue in countries such as Pakistan, which is still in the developing status.

Since the banking sector has significant significance in overall economic development, it is essential to understand how artificial intelligence works for businesses in Pakistan. Looking at the current trend towards more significant development of digital banking and the need to integrate new solutions into the work of companies, it is crucial to determine the strengths and weaknesses that exist in the application of AI. Moreover, it is equally essential for bank employees' perspectives on adopting AI to examine the probable resistance factors and the work in progress of the aspects that might need improvement in training and skills improvement.

Research Aim

Therefore, this research mainly concerns using AI in Pakistan's banking sector and its effects on business performance. This research targets the three central banks of Pakistan in the context of this study, Habib Bank Limited (HBL), Faysal Bank, and Bank Alfalah, to investigate how customer services, fraud detection, risk management, and operational efficiency are shaping up through the applications of artificial intelligence. In addition to outlining the cost and benefits of AI in banking, the research also discussed implementation barriers, decision-making factors such as data privacy and security, and employees' resistance to change.

Research Questions

1. How is AI being used in Pakistan's banking sector?
2. What challenges are faced by banks in integrating AI into their operations?
3. What are the implications of AI adoption for the future of the banking sector in Pakistan?

Significance of the Study

The findings of this research are beneficial for investment-oriented banks, government authorities, and other stakeholders in the financial services sector of Pakistan. According to Liu et al., 2024, advances in Information Technology, especially AI, need to be adopted in the banking systems to enhance efficiency in developing countries. To the banks, it is essential to know how AI can increase capital efficiency, improve customer experience, and reduce risks to remain competitive in a more digitalized economic environment. Organizations, including progressive banking operations, could benefit from applying advanced information technologies like predictive analytics and fraud-detecting systems.

Policymakers also found the results of this valuable research helpful in understanding the compliance difficulties when implementing AI solutions. As highlighted by Farooq and Pervez (2024), applying AI in banking is essential to address the connected problems associated with analytical data protection, cyber threats, and ethical matters. The present study's findings can help policymakers identify the processes that need to be put in place to build the necessary favorable context for AI advancement, but at the same time, to protect customers' rights and meet the obligatory global requirements.

To industry players in a broader sense of financial services, this study can be used as a reference guide on using AI technologies. According to Choithani et al., AI is disrupting the banking industry and the entire financial system, including Fintech, insurance, and investment services. Overall, this study adds to the body of knowledge regarding the practical application of intellectual technologies in Pakistan's banking industry and how AI implementation may help pull off innovation in the company and the overall Financial Services Division.

Besides, this study gave additional information about the attitudes of bank employees toward AI implementation. Ahmed and Ramish, in their survey investigation, anticipated that during the period 2020– 2024, AI is poised to be the game changer in determining the future of HRM practices in the business setting of Pakistan. This paper examines how employees approach AI and provide recommendations on how banks can address resistance against AI innovations.

The present study on the uptake and effects of artificial intelligence in the Pakistani banking sector is valuable in identifying the potential of technological solutions to meet existing problems in the field. To that end, this research examines AI implementation's opportunities, risks, and

perceptions. It seeks to offer valuable suggestions for banks, governments, and the overall financial sector to address issues and harness the potential of AI.

Literature Review

Global Adoption of AI in Banking

The increasing use of Artificial Intelligence (AI) has positively impacted the banking industry worldwide as it has various predisposed benefits like Increased operation efficiency, customer-enhanced experience, fraud detection, and, most significantly, risk management. Using AI worldwide in banking has changed old-school banking for good. Some prominent examples of AI in banking include Data analytics to study customer details, ML for customer categorization, chatbots for customer assistance, and fraud-suspicious tracking tools that operate in real-time (Waleed et al., 2023).

Fraud detection is among the most critical applications of AI in banking. In the current world of big data, complex datasets can be analyzed, and using pattern recognition, we can easily detect fraudulent transactions than when done manually. According to Javaid (2024), the application of AI in the financial services sector has increased the audit speed and accuracy of the fraud detection process. On top of that, AI improves customer service by allowing them to engage with chatbots and virtual persons. These tools offer customers service at any time, helping them with simple queries, thus alleviating the burden on human customer support agents (Cavaye & Oldfield, 2024).

Another has to do with the delivery of personalized banking, whereby the consumer is provided with information that fits his/her needs. Machine learning algorithms process customers' data to provide them with personalized financial products and services, which help increase customer satisfaction and loyalty. For instance, a customer receipt may recommend credit cards or debt products that its customer should apply to or purchase depending on the customer's buying pattern. Such a trend was revealed in developed and highly competitive emerging markets (Pattnaik et al., 2024).

However, adopting AI has some risks that every country experiences when integrating AI into banking, such as data privacy issues, ethical concerns, and job automation. Anbang, continued by Owolabi et al. (2024), notes that an increased call for AI in the banking industry will likely result in unemployment in customer services and backend operations as machines and robots take over the operations.

AI Applications in Emerging Markets

Thus, the nature and level of AI adoption in emerging economy banking remain relatively low but constantly rising. Some of these challenges include inadequate and weak infrastructure, regulatory frameworks, and low technology adoption among customers. However, this is where emerging markets reap the maximum advantages of integrated AI technologies as they gain operational efficiency, financial access to the isolated and under-banked populace, and improved services to them.

For instance, the application of AI to investigate creditworthiness has led to the provision of financial services that banking systems have yet to develop fully. Mobile banking and AI-powered financial services have enhanced access¹²⁴ in countries with larger rural populations. For instance, Dhyani et al. (2024), paying particular attention to the future of AI in financial inclusion,

stress the use of green banking technologies in emerging economies. These are helpful for efficiency in banking operations and are viewed as delivering environmental benefits that are a growing consideration for banking institutions globally.

AI innovations in banking are still initially evolving in emerging markets such as Pakistan, but development is already apparent. On the premises of Ahmed, Khalid, and Ghafoor (2024), it is understandable that AI revolutionizes the banking sector by providing the best services to customers, controlling risks, and lowering operational costs. However, they need help improving ICT and security systems to ensure safety.

Pakistan's Technological Landscape in Banking

Pakistan has experienced considerable development in its banking industry within the past ten years, including advanced digitalization and AI implementation. However, the country's challenges include a lack of technological backbone, low and probed internet discreteness, and regulatory factors that hamper the favorable consideration of advanced technologies such as AI.

However, several research papers suggest that the improvement of AI adoption in Pakistan's banking sector is being witnessed. The study by Naeem et al. (2024) establishes that Pakistani banks have begun to adopt artificial intelligent technologies to increase economic performance gains and customer satisfaction. AI is becoming popular in risk management and assessment, overcoming fraud cases, and individualized financial offers. For example, some of the small Pakistani banks have virtually embraced human-like robots such as chatbots and virtual assistants to attend to simple questions posed by banking customers, thereby cutting down the queues and increasing the satisfaction of the customers (Farooq & Pervez, 2024).

Moreover, Liu et al. (2024) also investigate the impact of digital technology diffusion on the productivity of Pakistan's commercial banks. They explain that their research shows how AI and other digital tools enable banks to increase competitiveness through lower operating expenses, better decision-making capabilities, and new customer solutions.

Other factors in Pakistan's technological development in banking are the results of working with foreign technology firms. For example, Huawei Pakistan is offering cloud services to grow the banking sector, as Nawaz et al. (2024) described. This partnership assists Pakistani banks in incorporating AI into their systems and using cloud technology in data handling and information security (Waleed et al., 2023).

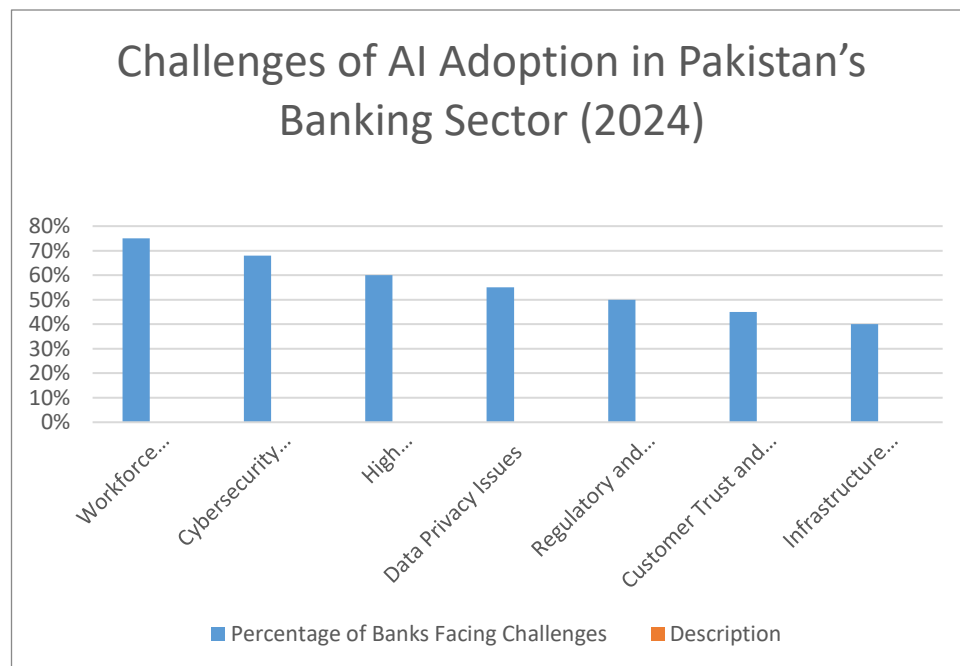
Challenges of AI Adoption in Pakistan's Banking Sector

Although AI promises a brighter future for Pakistan's banking sector, the following issues are caused by the limitation of AI implementations. Cyber security is one of the primary concerns because the company's activities are tightly connected with computer systems. Pakistani banks using digital banking services can easily be targeted, subjecting them to cyber security threats. Iqbal et al. (2024) write that, despite the numerous benefits that the integration of AI can bring to banking, if adequate measures to secure cyberspace are not taken, these organizations are likely to face the danger of repeating the losses that other institutions experienced from hacks and other related scams. The fourth major problem is the ethical issues related to the use of AI. In most AI-based systems, the system must amass significant amounts of customer data to perform its tasks efficiently. However, this presents a significant issue because there are questions regarding privacy and appropriate customer data utilization. Forbes articles by Owolabi et al. (2024) present some of the pertinent questions that arise regarding the use of AI in the financial sector regarding ethics issues. These specific issues are more acute in developing contexts such as Pakistan, where

rules and policies on data protection remain emergent. Another effect of adopting AI is displacing the workforce; that is, it replaces the human workforce with machines or computers. When the AI systems begin to handle repetitive tasks, there are likely to be losses in employment demanded in specific fields, specifically in the customer service section and organizational offices. In their paper, Ahmed and Ramish (2024) briefly discussed the effects of AI on future HRM practices in the business context of Pakistan, which is meant for the reskilling and Upskilling of the workforce. They suggest banks should incorporate funds to train employees in an AI-enabled world.

Challenges of AI Adoption in Pakistan's Banking Sector (2024)

Challenges	Percentage of Banks Facing Challenges	Description
Workforce Adaptation/Skill Gaps	75%	Lack of skilled personnel to manage and implement AI systems
Cybersecurity Concerns	68%	Fear of increased vulnerabilities due to AI-driven automation
High Implementation Costs	60%	Costs of integrating AI systems into existing banking infrastructure
Data Privacy Issues	55%	Concerns over compliance with data protection laws and the risk of breaches
Regulatory and Compliance Hurdles	50%	Lack of clear AI-specific regulations, making it challenging to innovate freely
Customer Trust and Acceptance	45%	Customers hesitant to adopt AI-driven services due to privacy or trust issues
Infrastructure Limitations	40%	Banks struggle with legacy systems and outdated technology frameworks



However, apart from the above, several infrastructural and regulating barriers hinder the implementation of AI in the Pakistani banking sectors. Ahmed, Khalid, and Ghafoor (2024)

argued that more funds to buy the requisite capital equipment, including high-speed internet connection and reliable power supply, are significant drawbacks for incorporating AI technologies in Pakistani banks. Furthermore, there are still numerous regulatory issues, including the old banking regulations and the absence of definite requirements as to when and how AI should be adopted.

However, given such threats, the following are potential advantages of implementation of artificial intelligence in the Bank of Pakistan: By doing so, the banks in Pakistan could explore AI technologies to optimize the organizational processes and for competitiveness in the global operation of banking services (Waleed et al., 2023).

Methods

Research Design

The study adapts a qualitative research design to establish a perspective on the uptake and effect of Artificial Intelligence (AI) in the Pakistani banking industry. This is prominent in capturing difficult-to-quantify experiences and how banking is changing due to AI. Unlike quantitative research, which deals with numbers, qualitative research seeks to explain human behavior and inclination through natural language, such as interviews or observations. The objective is to analyze the role of AI and its implications for the augmentation of customer service, curbing risks, and optimizing operations and business outcomes in banking.

The selection of the semi-structured interviews as the principal data collection technique is appropriate because the technique allows the interviewer to explore specific topics in detail while keeping to the set program. Their main advantage is a balance between more structured and less structured interviews that are more structured and more freedom. While the interviewer has a list of questions that need to be asked, he or she can proceed to ask follow-up questions depending on the answers given by the respondent; hence, the respondent has to make rich responses. It is beneficial when they focus on issues like AI, where some respondents might have rather unusual and valuable outlooks or approaches that need more details to explain than simple checklists.

Sampling

This study's sample consists of 10 respondents from three commercial banks in Pakistan. We only learned about three banks: HBL (Habib Bank Limited), Faysal Bank, and Bank Alfalah. The following is why these particular banks were chosen. First, they are some of the country's most prominent and technologically advanced banking organizations, famous for leadership of technological innovations in the banking sphere, including AI usage. They have large customers, are widely spread, and have invested in improvements, which makes them good examples of how banks in Pakistan are implementing artificial intelligence.

The respondents are managers in organizations, technology specialists, and employees who work directly on or supervise AI projects. Managers were selected mainly because they are accountable for managing strategic tasks, and their convictions best explain how AI influences decisions and organizational outcomes. Technology experts were included because they are implementation agents overseeing the integration of artificial intelligence in banking and have a technical understanding of the constraints and benefits of AI in the industry. Other employees, including frontline workers such as customer care attendants or other staff members involved in other operational tasks, give the prosaic view of the impact of AI on the various aspects of banking and job satisfaction among other employees.

Data Collection

Semi-structured interviews were administered to the 10 respondents drawn from the selected banks in the course of data collection. From interviews, these questions were developed to cover the areas of interest of the research, namely the role of AI in customer service, risk management, and operations and the prospects of AI in banking. The data collection for this study took place over a two-year period, covering both 2023 and 2024. This timeframe allowed for capturing any emerging trends and developments in AI applications within Pakistan's banking sector, especially as AI technologies evolve and banks adapt to them. Conducting interviews across these two years provided a longitudinal perspective on how AI integration has progressed and helped identify any shifts in strategies, customer responses, or operational challenges over time.

Every interview included 10 broad questions, which were to provide rich qualitative information regarding the current usage of AI in operations and the issues that arise from it. The interviews were face-to-face based on the consultant's availability of the consultant. Using semi-structured interviews, the interviewer could dig further into issues that seemed particularly interesting to the respondents or issues on which they seemed to possess more information. Such openness lets the interviewer provide valuable information about the peculiarities of AI approaches and obstacles found in the work of each bank.

Data Analysis

Data analysis within this study involves coding and theming the responses gathered from the interviews. Open coding has been done on the recorded responses once the interviews are transcribed. Other headings under the broad subject area include customer service, risk, operations, and management, which were from the initial coding structure. These themes or sub-themes may arise during coding since the respondents may give different answers from those assumed earlier. Following coding, there is a thematic analysis in which common characteristics across the data are found. The thematic analysis involves sorting the codes into meaningful, naturally occurring themes related to the research themes. If the researcher aggregates these responses, he/ she get a holistic result, likely presenting a broader view of how AI is utilized in the banking sector. The analysis also reveals salient features of emerging strategies and obstacles the banking sector encounters in the context of Pakistan's developing economy while embracing AI.

Results

AI Daily Operations in

According to the analysis, the research helps investigate whether AI is being incorporated in the three banks, namely, HBL, Faysal Bank, and Bank Alfalah, daily. The top AI use cases are customer service chatbots, fraud detection models, data analytics for customer profiling, and AI in client-oriented banking. For instance, Bank Alfalah deploys its chatbots to deal with preliminary customer inquiries, leaving low-level tasks for artificial intelligence. Likewise, HBL has incorporated AI fraud detection algorithms that remarkably identify device and transaction behavior in real time and reinforce security.

Common AI Applications in Three Banks

AI Application	HBL ¹²⁸	Faysal Bank	Bank Alfalah
Chatbots	Implemented	Implemented	Implemented

Fraud Detection	Implemented	In Progress	Implemented
Personalized Services	Implemented	Implemented	Implemented
Predictive Analytics	In Progress	Implemented	Implemented

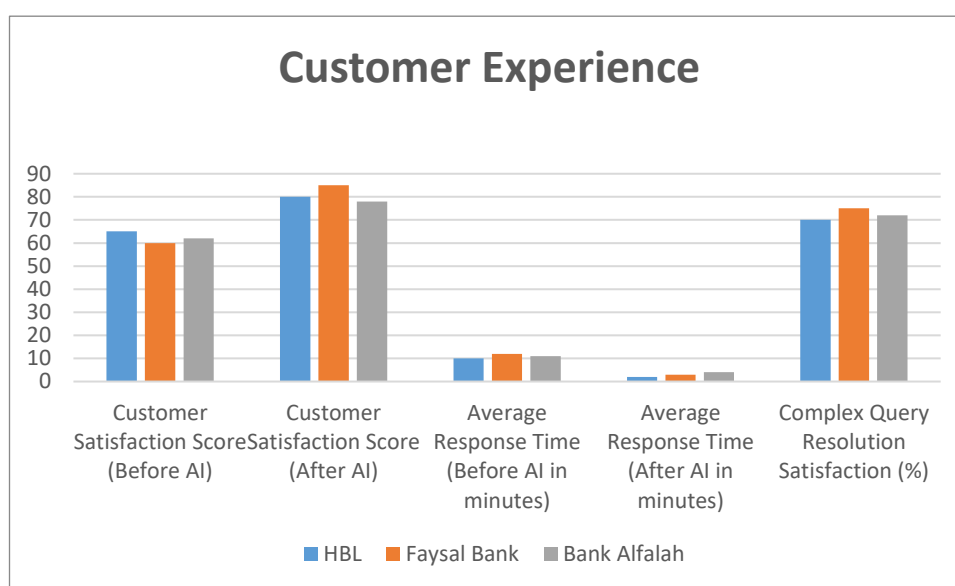
Employee Perception of AI

Employees and AI have different perceptions of it in the organization. A pilot survey of managers and technology specialists indicated that all respondents saw AI as a technology that enhances productivity and decision-making. They like AI's capacity to reduce responsibilities and provide more time to undertake insightful activities. However, low-skilled telephone-based customer service and back-wash office employees voice their fears of job automation. Overall, most employees think that although AI has helped lower their work burden in most cases, its introduction has made them concerned about future job security. Some respondents also point out that AI has brought a layered challenge where they need to train new systems and frequently deal with artificial intelligence tools. However, the technology experts in these banks view this as an inevitable progression. They encourage companies to invest in these training and development programs to prepare employees for an AI-heavy future.

Customer Experience

As a result of AI, customer experience in the three banks has been enhanced. Today's clients benefit from fast and effective customer service through artificial intelligence chats and voice recognition. It also provided facilities to avail of more personal banking services. For instance, the Faysal Bank AI system can review the credit and offer credit cards or loans that are suitable for the customer, increasing customer satisfaction.

Bank	Customer Satisfaction Score (Before AI)	Customer Satisfaction Score (After AI)	Average Response Time (Before AI in minutes)	Average Response Time (After AI in minutes)	Complex Query Resolution Satisfaction (%)
HBL	65	80	10	2	70
Faysal Bank	60	85	12	3	75
Bank Alfalah	62	78	11	4	72



The survey shows that AI has positively changed customer satisfaction scores, mainly with quicker resolution of issues and around-the-clock support. However, to some respondents, the role of AI is acceptable while performing simple queries. However, customers are dissatisfied when they have more complicated issues because an AI system has a different understanding than human staff members.

Operational Efficiency

AI has been found to advance the daily efficiency of the three banks under consideration. It analyses fraud cases and recommends action in a much shorter time; it is used to identify and label suspicious activities. Also, using data analytics in decision-making has been boosted through artificial intelligence to provide real-time customer behavior and market trends.

For example, HBL has reduced the time it takes to grant loans by using AI, which detects risks faster than conventional approaches. Bank Alfalah also noted management satisfaction in processing transactions, meaning that many backend operations, including input and output, have become automated because of the use of artificial intelligence systems.

AI Impact on Operational Efficiency

Efficiency Metric	HBL Improvement	Faysal Bank Improvement	Bank Alfalah Improvement
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Fraud Detection Time	40% faster	25% faster	50% faster
Loan Approval Time	30% faster	20% faster	40% faster
Transaction Processing Speed	35% faster	30% faster	45% faster

Challenges Identified

However, several challenges were identified when posing several questions to the respondents. One aspect is that there is a common problem in the three banks, including data privacy. Since most AI system implementation depends on large quantities of customer data, data protection could be improved. Some of the interviewees from Faysal Bank reported that they are legally bound to provide high levels of protection to customers' data, which makes it more challenging and costly for firms in the organization of AI. Another considerable factor is the costs incurred when adopting and implementing AI systems in an organization. Incumbent small-scale or low-budgeted banks cannot invest in advanced technologies like those supporting AI. Besides, the workforce is relatively resistant to change, especially older employees; they feel they need to be more comfortable with change to AI-based processes.

Key Challenges of AI Adoption

Challenge	HBL	Faysal Bank	Bank Alfalah
Data Privacy	High Concern	High Concern	Medium Concern
High Implementation Costs	Moderate Concern	High Concern	Moderate Concern
Workforce Resistance	Low Concern	Moderate Concern	High Concern

Key Challenges of AI Adoption

Workforce Resistance	Low Concern	Moderate Concern	High Concern
High Implementation Costs	Moderate Concern	High Concern	Moderate Concern
Data Privacy	High Concern	High Concern	Medium Concern
Challenge	HBL	Faysal Bank	Bank Alfalah

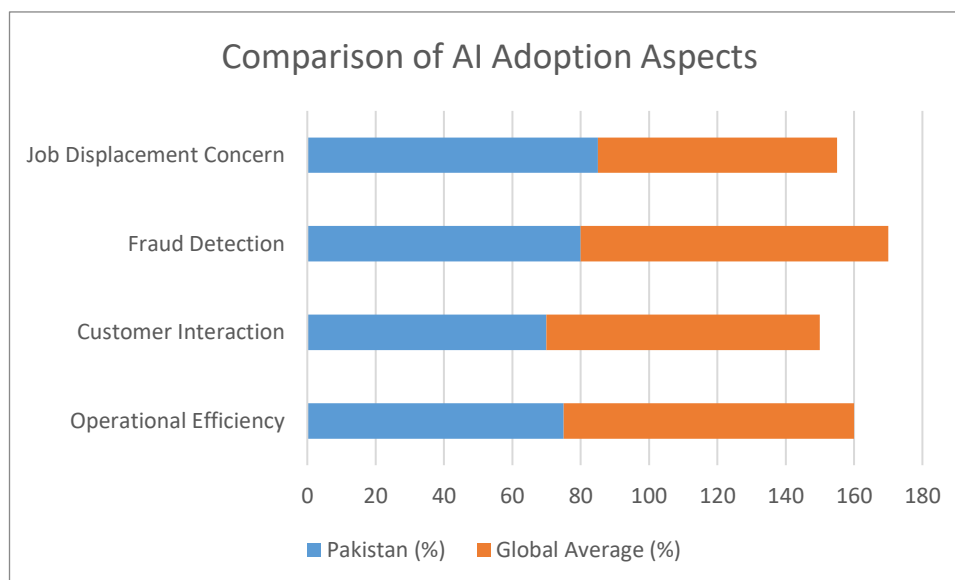
AI has to do with aspects of banking operations whereby the customers and the overall activities of businesses are made efficient. Therefore, the benefits of AI implementation include efficiency, cost reduction, error minimization, and revenue maximization. On the other hand, the risk factors include Data privacy, high cost of implementation, and employee resistance.

Discussion

Interpretation of Results

The study of AI implementation in Pakistan's banking industry exhibits similarities and differences in varying contexts to global benchmarks. As with the rest of the world, AI has dramatically enhanced the ways of doing business, customer relations, and fraud control in Pakistan's banks in similar ways observed in the Western or other Asian banking systems (Pattnaik et al., 2024). Nevertheless, some contextual factors differ from others in Pakistani AI adoption. Unlike developed countries where AI-integrated banking comes quickly, Pakistan has problems, such as a lack of infrastructure, many uncertainties in Pakistani rules and regulations, and fear of data privacy and protection (Javaid, 2024). This divergence clearly explains why more localized strategies for leveraging the benefits of AI need to be developed in the country.

Aspect	Pakistan (%)	Global Average (%)
Operational Efficiency	75	85
Customer Interaction	70	80
Fraud Detection	80	90
Job Displacement Concern	85	70



Global trends also shift the focus to using AI for customer services by introducing chatbots and differentiated financial instruments. Pakistani has also commenced in this regard. However, similar to previous findings, it was revealed that the employees' perceptions indicated higher levels of fear towards job loss because of the disruptive effects of technology in Pakistan, especially in customer-facing and operational jobs. Thus, this is evidence that Pakistan's labor market may be more at risk of being disrupted by technology than other regions with substantive organized employment pathways for retraining programmers (Owolabi et al., 2024).

Benefits of AI

AI has brought unprecedented value to Pakistan's banking industry. The most noticeable reform has probably been in the area of customer relations. Artificial intelligence in chatbots and virtual assistants has maximized the speed of customer service delivery due to always being available to respond to basic common queries that may flood the customer service desk, freeing human beings consistently (Maseke, 2024). It enables banks to attend to the growing customer demand without a corresponding rise in staff costs and offers a faster response to customers, leading to increased satisfaction.

It must also be said that such effects as increased operational efficiency have been improved, for instance, through distinguishing customers' information to deliver loans faster with the help of AI algorithms. In the back end, using AI in data entry and transaction verification activities has also saved time and eliminated errors that may be caused by human beings, making the operations of banking services faster (Javaid, 2024). This efficiency improvement has been incredibly beneficial for small banks, which have to overcome some of their limitations compared to large ones by performing more efficient operations.

As for the con aspect, AI systems applied in Pakistan have revealed a significant tendency towards detecting fraud while preventing it. AI in transactional datasets enables the identification of parties' behavior in real-time instead of gleaning through large data sets with the help of analysts because the performance of AI algorithms is superior to that of an analyst (Maseke, 2024). These have caused a reduced rate of financial loss due to fraud due to the installation of fraud prevention measures.

Challenges

However, several specific factors make AI adoption more challenging for Pakistani banks than their counterparts in more developed markets. This is the case mainly due to regulatory challenges, which still need to be solved. Even as world financial regulators integrate AI in banking, Pakistani settings remain nascent, and well-defined legal rules on using AI and data protection policies still need to be established (Javaid, 2024). Banks are, therefore, running their operations in a relatively ambiguous legal framework, which explains the slow adoption of AI technologies.

However, the confidentiality of data is much more challenging in Pakistan because the cyber security conditions are somehow weaker than at international levels. As AI systems depend on the massive data of customers, the growing instances of data breach and misuse have become an issue of concern for banks, and AI integration for operational enhancements provides robust data security measures to banks (Owolabi et al., 2024).

There is also a problem with the organizational assimilation of AI, including training workers who resist the technology because they believe AI displaced them. This is a big worry given Pakistan's labor market, which needs more training and transition programs often seen in developed economies (Pattnaik et al., 2024). Therefore, it is difficult to generate much opposition from the workers; this is especially prevalent in customer care and support operations functions.

Practical Implications

Consequently, this study's results present several valuable practical insights for banks and policymakers in Pakistan. To reduce the chance of resistance from employees, banks should pay attention to efforts that measure up correctly with the implementation of AI possibilities. Making available reskilling programs can go a long way in ensuring that employees move to other higher human intervention jobs as they fear being displaced by the technologies. Moreover, for data privacy and to be ready in case of future legal requirements, cyber security has to improve profoundly.

To the policymakers, it is, therefore, important that there are brought into existence policy frameworks about the use of AI within the banking sector with a particular reference to the legislation that surrounds the protection of data belonging to clients while at the same time encouraging innovation. The formulation of a regulatory structure that enhances the use of artificial intelligence without exposing the country to risk assists the banking sector of Pakistan in embracing all aspects of artificial intelligence, hence boosting its competitiveness.

Conclusion

The study proves that the use of artificial intelligence (AI) has emerged strongly as a phenomenon with a significant influence on Pakistan's banking sector in a scenario embedded in global socio-technical characteristics and local limitations. The study brought out the general idea that implementation of AI technology in the studied commercial banks has led to enhanced operational efficiency, customer interaction, and fraud detection as seen from an analysis of various parameters such as time taken in detecting frauds, time taken in approving loans; and the number of transactions per hour. Therefore, banks such as HBL and Bank Alfalah promised an enhancement in the respective times for fraud detection by up to 50% and in loan approval time, proclaiming the efficiency of the used technology. Customer satisfaction has also improved, mainly because chatbots and other technologies supported by artificial intelligence, among other things, render round-the-clock services but still present particular challenges in handling more complicated queries.

However, there are still many drawbacks, including job insecurity issues, especially regarding the digitalization of customer relations services' employment, which are more acute in Pakistan than globally. This is coupled with regulatory uncertainties and data privacy issues, which make it difficult to determine the prospects for AI adoption. Given the above challenges, banks must incorporate competitive AI training courses in their institutions to train their human resource to fit the sophisticated human/ AI partnership rather than offering elements of the jobs to AI adaptations. For this reason, it not only assists in managing employees' fear of job loss but also encourages constant training and process improvements within the workplace. Also, improvements to data protection measures coupled with the best practice cyber security measures would greatly benefit and aid in creating consumer trust, which is central to AI investment.

The research also suggests that existing and new banks should formulate a clear AI structure corresponding to their business goals and regulatory requirements. The following guidelines should form the strategic pattern when implementing AI: The organizations should evaluate the

performance of AI periodically and have a system of collecting customer feedback frequently to check on the existing and flowing AI applications and services. Further studies may be conducted with more target banks and financial institutions in Pakistan to have a more extensive approach to AI adoption in the respective sectors. In addition, several comparative studies would provide more information on the use of AI in other industries, including the healthcare sector or retail, to identify excellent and transferable practices. They can significantly help to explain and enhance AI's disruptive affordances throughout Pakistan's economy.

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The Impact of Lean Manufacturing on Supply Chain Performance in the Pakistani Textile Industry

Shezil Shahid¹, Dr Muhammad Adnan Sial²

¹School of Business and Management, Information Technology University, Lahore, Pakistan

²Assistant Professor: UE Business School, Division of Management and Administrative Science, University of Education, Lahore, Pakistan

Abstract

The objective of this research topic was to study and evaluate the effects of the integration of lean manufacturing on the supply chain performance in the textile sector of Pakistan under the domain of innovative production strategies. The study also examined operational efficiency as a mediating variable and organisational culture as the moderator. The four supply chain measures under focus were Delivery Accuracy, Turnover, Lead Time, and customer satisfaction; the lean tools assessed were Just-in-Time and Total quality management. The current research utilised analytical cross-sectional research and a sample of 111 employees working in the textile industry were approached to fill in the questionnaire. The research is a formal, cross-sectional, causal study conducted using communication-based data collection (questionnaires) to examine the impact of lean manufacturing on supply chain performance in Pakistan's textile industry. Cronbach's Alpha was used to check the reliability of the data. Studied hypotheses were tested through Process Hayes for SPSS version 27. The research reveals that lean practices help reduce waste, enhance resource utilisation efficiency, and improve manufacturing planning to meet the targets. An organisational culture with an innovative culture embraces flexibility and decentralised decisions, empowering organisational personnel to improve outcomes. The research also shows that operational efficiency partially explains the level of relationship between lean practices and supply chain performance. The findings of the research are helpful for the practitioners for a better understanding of devising policies for applying lean manufacturing to attain competitive advantages in the Pakistani textile industry.

Introduction

Broad and Specific Area

This research can be classified under operations management stream of research with specific emphasis on lean manufacturing and supply chain management. Lean manufacturing has been defined as the best organizational practice in the reduction of wastes and enhancement of operations as postulated by Womack and Jones (1996). In addition, the integration of supply chain measures with lean elements is well understood as a winning formula in sustainable industries and business development (Shah & Ward, 2007).

The more detailed objective of this research, therefore, is to analyse the application of lean manufacturing practices on supply chain performance in the context of Pakistan textile sector. The study also seeks to establish the role of organisational culture as a moderator and operational efficiency as a mediator of this relationship. Technological support is crucial for implementing lean initiative, while thorough support from the managerial culture promotes lean principles' application. This paper adds to the lean manufacturing research by offering a reflection of the

system's relevance to developing countries and the role the system can play to improve efficiency within resource- poor sectors (Hines, Holweg, & Rich, 2004).

Research Problem

The study focuses on the problem area of understanding the impact of lean manufacturing practices on supply chain performance: a case study of Pakistani textile industry. Even though lean tools like Just in Time (JIT) and Total Quality Management (TQM) are implemented in many developed nations, literature on the subject in the context of developing economies, textile industries in particular remains sparse. This research seeks to fill this gap by looking at how these lean practices impact on the key supply chain performance indicators including delivery accuracy, inventory turnover, Lead time & customer satisfaction. Further, the research aims at establishing the impact of operational efficiency as a mediator on the relationship between lean practices and supply chain performance with organisational culture as a moderator. This problem is important as it addresses the question of whether lean manufacturing solutions are applicable and efficient in the environment that has not been examined thoroughly in prior literature.

Significance of the study

This research is of immense importance in both the academic and the practical fields due to existing challenge of poor supply chain performance in the textile industry of Pakistan, inability to implement lean manufacturing practice. Flexible manufacturing, most commonly known to eliminate operational waste, is the best approach for industries to stay healthy in a world economy (Womack & Jones, 1996). Through identifying the moderating factors of the adopted organizational culture as well as the mediating factors of operational efficiency, this work provides a rich picture of the implementation of lean practices.

The research result in filling some of the knowledge gaps within the current lean literature especially with regard to the application of lean manufacturing in limited resource environments especially within developing economies (Hines, Holweg, & Rich, 2004). Furthermore, it is useful for industry practitioners and policymakers to understand how the basic of lean manufacturing should be implemented to counter with the contextual issues and improve the business operation (Shah & Ward, 2007). These contributions are especially helpful for textile sector of Pakistan, as it is one of the main economic sectors of a country and needs to compete on global level.

Motivation of the Study

The need for this research emanates from the increasing adoption of lean manufacturing principles as a tool for enhancing the functioning of supply chains and especially in countries in the developing world. Textile industry as an important sector of the economy of Pakistan suffers from several issues such as the improper operation, stock accumulation and logistic structures in relation to production line. Application of Lean manufacturing technologies like JIT and TQM can effectively respond to these challenges, which would increase escalation of operations efficiency and subsequent improvement of the lead time, inventory turn over, and client satisfaction. However, the research domain lacks information on the implementation and impact of these practices in the Pakistan Textile Industry. Shah and Ward (2007) have established that lean practices have achieved gains across the globe in several industries, but its application in developing countries such as Pakistan is still experimental. This study is informed by the observed gap in the existing literature and an attempt is made to provide a roadmap as to how lean manufacturing can be successfully deployed in the textile sector. As it concerns general and organizational variables like operation efficiency, this research aims to bring more realistic solutions toward enhancing the supply chain performance. With increasing world competition

and increasing trend in industries towards lean manufacturing this type of study is useful in helping companies operating in the Pakistani textile industries to appreciate how they can adapt to implement lean manufacturing to their advantage for sustainable growth and development.

Literature Review

Lean Manufacturing Practices

Lean manufacturing practices have emerged as an essential phenomenon in enhancing the effectiveness of the value chain more so in competitive environments, escalating costs, and complexities. Lean manufacturing therefore aims to eliminate operational cycles along with improving efficiency and value delivery to the customer (Womack & Jones, 2003). This concept, which begun in automobile through Toyota Production System (TPS), has spread to many industries all over the world including the textile industry in Pakistan (Liker, 2004).

The Origin of Lean Manufacturing and Its Adoption in Pakistan's Textile Industry

Kanban or lean manufacturing originated in Japan with the Toyota Motor Company, to identify and purposely eliminate non-value-added activities from production process. Since lean principles became popular, industries around the globe started implementing concepts to enhance their effectiveness (Seth & Gupta, 2005). The Pakistan textile industry is one of the biggest players of the country and has a great contribution to the growth of Pakistan's economy and thereby it has established lean practice in its working system to sustain on the international market.

However, the textile industry has its own problems and challenges which are as follows; high operation cost, problems in Textile production line, and persistent problems related to supply chain management (Vanichchinchai, 2019). Because of these challenges, firms in the textile industry are forced to look for ways of implementing lean manufacturing policies including the JIT, TQM and VSM in a bid to improve the supply chain performance and thus the competitive edge of firms in the industry (Bhamu & Singh Sangwan, 2014). These firms are able to adopt lean manufacturing in order to incorporate increased efficiency in their production lines, reduce the instances of waste and be more responsive to the customers.

Key Lean Manufacturing Tools: JIT, TQM, and VSM

Lean manufacturing employs a variety of tools that are designed to reduce waste and improve efficiency and the three of the most prominent tools in lean manufacturing are Just-in-Time (JIT), Total Quality Management (TQM), and Value Stream Mapping (VSM) which are exclusively used in the industry.

Just-in-Time (JIT)

JIT constitutes one of the most important lean manufacturing concepts that deals with a low inventory stock." By working together to manage inventory it also makes certain that raw materials are purchased and products manufactured without creating large inventories and stocks." It reduces holding costs as well as enhances cash flow in the organisation (Shah & Ward, 2007). When applied to the textile industry, JIT allows firms to match the production calendar to the needs of consumers and to achieve a high level of delivery precision (Parveen Mohammad & Rao Tulsiram, 2009). In terms of production output and the delivery of products and services, the various firms within the textile chain can ensure that they meet the intended customers demand by releasing inventory and carrying out overhauls to their production processes.

Total Quality Management (TQM)

TQM is yet another successful lean tool that has a clear aim to make a product more qualitative with help of strict performance regulation and effective processes changes. This approach makes it certain that any worker within the organization has the duty to implement changes to enhance quality so that customers will be highly satisfied (Deming 1986). To the textile sector, TQM guarantees the achievement of the best quality standards of products; something that goes along ways in satisfying the customers and creating brand advocate. The focus on quality management enables the firms to cut down on the defects and improve customer feedback by the issue of quality products since less energy is used on substandard services (Fullerton, Kennedy, & Widener, 2014).

Value Stream Mapping (VSM)

VSM is one of the lean manufacturing tools that help organizations to visualize the material and information flow in the manufacturing processes. This assists in the detection of unnecessary processes within the supply chain so as to reduce the cycle times of operation for the firms, and this is explained by Rother and Shook, (2009). Therefore, VSM can be of most utility in the textile industry of Pakistan where fluctuations in customers' demand and production timetables are quite common. The reduction of waste and nucleation of value addition activities may enable the firms to align their manufacturing logistics with customer requirements, thus improving the supply chain and overall customer satisfaction (Bhamu and Singh Sangwan, 2014).

Impact on Supply Chain Performance

There is literature evidence that lean manufacturing tools including JIT, TQM, and VSM affect supply chain performance. Not only do these tools make operation easier, but they also lead to better several supply chain performance indicators comprising of delivery precision, inventory turnover rate, and satisfaction.

Delivery Accuracy and Lead Time

Order fulfilment is a key supply chain metric which is affected by lean tools such as JIT and VSM. Companies that use JIT are able to make goods premised on customer need because the delivery requirements are seldom delayed (Parveen Mohammad & Rao Tulsiram, 2009). Furthermore, VSM allows the firms concerning the process wastage and optimizing the lead time of the production process in order to respond to the customer order promptly.

Inventory Turnover

Other performance indicators affected by the lean manufacturing practices include inventory turnover that is used to determine how often the firm restocks its inventory. Thus, through JIT, the stock of inventories can be kept extremely low and thus holding costs lower with high cash returns. Companies, which have achieved the optimal supply turnover, adapt to the changes in demand more effectively, avoiding stock shortages or overstocking (Seth and Gupta (2005). This is especially the case in textile companies and organizations because the market trends and customer preferences can easily change.

Customer Satisfaction

Another advantage of the lean manufacturing systems is to do with issues to do with customer satisfaction. Tools like TQM relate to lean initiatives are common and are aimed at working to provide clients with product that meets or exceeds their expectations (Deming, 1986). Increased product quality in conjunction with timely delivery result in increased customer satisfaction and this is one of the vital factors to business success in some sensitive industries including textiles (Fullerton, Kennedy, & Widener, 2014).

Supply Chain Performance Metrics

Measures of supply chain performance have been widely used to evaluate the effectiveness of operation within organizations. These metrics assist an organization to quantify its level of compliance with customer needs in the most efficient and effective way possible. Comparing with the other measuring tools, several aspects can be applied on the five-lean manufacturing KPIs that analyse performance of supply chains, such as delivery accuracy, inventory turnover, lead time, and satisfaction of customers (Vanichchinchai, 2019). Certain methodologies; that are Just in Time (JIT), Value Stream Mapping (VSM) and Total Quality Management (TQM) have main contributions for enhancing such performance measures.

Delivery Accuracy and On-Time Delivery

Delivery accuracy; considered among the most significant KPIs of any supply chain, defines the capacity of the supply chain to deliver the right product quantity and at the right time and to the right customer. Delivery accuracy extends from on-time delivery, which determines the timeliness of the deliveries since this is a key component of customer satisfaction (Womack & Jones, 2003). Essentials of timely delivery are also so important in industries like textiles that are fully competitive and sensitive to fluctuations in demands from all over the world. Companies using methods like JIT and VSM as their current best practices have certainly bridged the gap between operating expenses and customer value and waste reduction (Babu, Parakkal, & Suresh, 2008).

JIT helps to create products that were sold, avoiding having too many spare parts in stock while guaranteeing that a company releases its products at the right time. Reducing inventory and waste otherwise contributed to by the excess and the storage of unsold stocks that may take long before finding a market increases delivery performance hence the level of satisfaction among the other customers (Seth & Gupta, 2005).

Furthermore, VSM is invaluable to the identification of potential and actual constraints in production as well as delivery cycles. Through understanding all aspects of the value-stream, certain activities where lead times are prone to accumulation can be analysed, and solutions to eliminate them are implemented, making delivery accuracy an increased efficiency (Rother & Shook, 2009). The use of these tools in production has been of most importance in industries such as the textile industries whereby meeting the delivery schedules plays a major role in the sustainment of the existing customer base.

Inventory Turnover and Resource Management

Another performance driver in supply chain management is the inventory turnover. It relates to the rate at which a firm cycles stock, that is how often it uses up its stock and restocks it, it measures the efficiency of a firm's management of inventory (Fullerton, Kennedy, & Widener, 2014). The lean manufacturing environment points to a high inventory turnover as evidence of responsible use of its resources. Companies that practise JIT production systems have little stock as they only manufacture products when required. This approach reduces the holding costs, and also gives the least number of wastes while using the resources and achieving the planned goal (Shah & Ward, 2007).

In textile mills the elements of style and fluctuating buying preferences call for an effective management of inventory through JIT. Organization with higher inventory turnover is in a better position to manage their inventory based on market fluctuations without stock piling obsolete or excess inventory. According to Parveen Mohammad and Rao Tulsiram (2009), the companies whose inventory turnover ratio is adjusted more effectively are least sensitive to market forces and able to respond these changes of customer demands quickly. This determines cash position

greatly and also increase general flow of supply chain since it helps in measuring inventory position in relation to customers requirements.

Lead Time Reduction

Lead time is considered as the time that between the order receiving and finished product delivery; it is considered as one of the most important indicators of supply chain performance. JIT manufacturing and VSM practices, in general, significantly contribute to minimizing lead-time through the identification of additional wastes, optimization of such systems, and the complete integration of material- and information flow (Bhamu & Singh Sangwan, 2014). In a lean system, work-in-progress inventory, or creating more of a product than is necessary at any one time, is eliminated, as this increase wait times and slows down production (Liker, 2004). One of the most important aspects of VSM in the production work is to map out the process and find out what causes a delay and then make improvements hence cutting on lead times, in this case Rother & Shook, (2009) acknowledges this. For instance, in the textile industry the lead times vary significantly due to fluctuating customer requirements, therefore is immensely vital to minimize lead times. From relevant studies, textile firms that incorporate lean can source raw materials fast, and thereby reduce the time taken to provide products in the market (Sundar Raju, Balaji Anand, & Satheesh Kumar R., 2014).

The same applies to overhauling or cutting down the lead times or the time it takes to complete a particular process in a business since this many leads to increased customer satisfaction rates. Shorter lead times enable an organization to complete a customer order within a shorter duration and this in return can create customer order traffic and increase customer loyalty (Seth & Gupta, 2005). While most companies manufacture products that often can be found in other similar companies or industries such as textile, Lead time reduction is a valuable aspect of the supply chain that gives a company an edge over the other companies in the industry due to the efficiency in delivery.

Customer Loyalty

Another overall supply chain performance indicator can be solved in customer satisfaction because it is one of the main factors deciding the future reputation and prosperity of the company. The lean manufacturing tools like were designed for the purpose of enhancing product quality and guarantee that customers receive products that meet their needs (Deming, 1986). As part of the lean system the objectives on cost reduction to do with wastage also help in creating higher quality goods and services that enhance customer satisfaction (Fullerton et al., 2014). Often, the key indicators in the textile industry are the quality of products, the speed of delivery, as well as the company's flexibility to meet new customer's requirements.

TQM also involves enhancing the business organisational process from the procurement of the raw materials and or input through to delivery of the final product (Shah & Ward, 2007). This concern is also effective in maintaining low defect rates but also in improving the customer satisfaction, as satisfied customers will always demand for the product and even recommend other consumers to buy from the company.

There is no doubt that TQM, JIT and VSM is a collective set of lean practices that can help the companies work more effectively in their supply chain management to increase customer satisfaction and hence customer loyalty. Companies that ensure that their products are excellent both in quality and timely delivery, low inventory, and short lead times assure market competitiveness (Vanichchinchai, 2019).

Therefore, this paper establishes that supply chain performance measures are important tools in the assessment of the lean manufacturing environment. KPI's such as delivery accuracy, inventory turnover, lead time, and customer satisfaction offer a lot of value as they alert a

company on how well it is managing the available resources to meet customers' needs. Similar to JIT, TQM, and VSM techniques, companies can enhance these performance indicators leading to higher operational effectiveness, decrease in cost and increased customer satisfaction. That is why it is crucial for industries such as textiles, where the competition is rather high, and customers' requirements are highly unpredictable – lean manufacturing helps introduce the competitive advantage.

Organizational Culture

Lean manufacturing as a system in an organization cannot be implemented simply by the mere adoption of all the tools and techniques associated with the concept – they are heavily predicated on the culture of an organization. Consequently, organizational culture, which is the shared beliefs, values, assumptions, expected behaviours, and artefacts that create the climate for actions influencing choices, values, and practices of a firm's employees regarding lean manufacturing is considered a vital determinant of success or failure of lean manufacturing attempts. Therefore, for lean practice to work their have to be responded organizational culture of innovation, improvement and employee^ (Kelly, 2011). On the other hand, lean faced major hurdles in organizations with a rigid or even a highly established power structure that does not allow everyone in the team to have an opportunity to speak. Organizational culture in lean production Lean manufacturing entails constant product aspects enhancement and productivity enhancement, and this aspect needs an effective organizational culture that embraces the entire firm. Because at its core, lean is about eliminating waste, maximizing flow, and creating more value for customers, creating a lean environment, an organisational culture that supports and drives lean, has to be oriented towards flexibility, customer focus and integrated workforce (Liker, 2004). This is because a culture that is innovative and autonomous and the one in which communication is encouraged shall be easier to implement lean than in a culture that is all about control and little initial communication and decision-making power. For instance, when discussing the application of lean in Pakistan stakeholder specialized in textile production pointed to positive organizational culture as a major precondition for successful application of lean tools like TQM and VSM. These tools require incorporation of all employee and support for quality and improvement (Parveen Mohammad & Rao Tulsiram, 2009). When employees are capable of making suggestions in organizational decision-making processes, then they will easily adopt lean processes and help to enhance lean outcomes.

Employee Empowerment and Autonomy A reinforcement of lean manufacturing cultural principles is empirical power. This concept therefore entails delegating the power, right and authority to workforce to work and make decisions on their own. In a lean environment, employees are expected to develop awareness of issues and bring out the ideas on how improvements could be made and also empower themselves on their working processes (Seth & Gupta, 2005). Employee empowered are more committed towards its organizational objectives which are pivotal in lean implementation. They are also likely to notice that aspects of the work procedures require optimization and feedback that can introduce sweeping changes to productivity and misuse of resources (Bhamu & Singh Sangwan, 2014). Consequently, firms with tightly coupled structures and implemented authority represented within a hierarchical format tend to face challenges in adopting lean because workers may feel involvement or reluctant to be proactive.

For example, where there is a culture of employee empowerment, firms in the textile sector are more likely to get positive results when undertaking lean manufacturing. Due to employee autonomy decisions are made fast and the firm quickly responds to customer needs – highly important in a competitive setting (Shah & Ward, 2007).

One cannot overstate the value of promoting creative and informal environments to achieve lean manufacturing. Lean is rooted on the Japanese philosophy of gradualism or kaizen, which in Lean

manufacturing means deliberate refinements in methods to increase production efficiency and customer value (Liker, 2004). If there is to be any stop-start of continuous improvement then the employees have to be prodded into being creative by coming up with new ways to fix the operations.

In large organizations with established corporate culture, which might be bureaucratic or conservative, with low tolerance to risk, people will not volunteer to approach the management with new ideas or suggestions on how they may change the manner in which things are done. This is because the bureaucratic and risk-averse organizational culture may work against any attempts at lean implementation. However, a culture that is permissive of trial-and-error attempts, failure, and risk-taking, such that such actions are not punished but rather encouraged, will build the creativity required to achieve the principles of lean implementation (Fullerton, Kennedy & Widener, 2014).

For example, in the Pakistan textile industry, those firms whose culture encourages regular employee training to adapt innovative behaviours for solving improvement challenges are most likely to realize greater value creation orientations for TQM and VSM. These tools need more changes of mindset for long term improvement, and for this to consolidate best, organizational culture of innovation is favourable (Parveen Mohammad & Rao Tulsiram, 2009).

Lean manufacturing is best to be integrated in organizations which are decentralized and flexible. This gives decision making responsibility to every one instead of just the managers at the higher ranks of the organization. Decentralization enables the teams on the ground to make decision and respond to changes in the process of production without awaiting directives from the higher authorities (Seth & Gupta, 2005).

Another significant higher order requirement is flexibility so as to enhance the implementation of lean practices. Lean manufacturing also called lean production system involves the organization to respond to the variability in customer demand, change production plans and patterns, and make other improvements to existing systems in order to reduce or remove waste (Bhamu & Singh Sangwan, 2014). Large organizations with bureaucratic culture, that do not encourage cross-functional cooperation may also face major challenges implementing lean because they are slow in adjusting.

In organizations with strong top-down decision-making system, lean tools such as JIT and TQM may encounter some problems in their execution. The officers and the employees might consider themselves to be secluded from the process and incremental levels of engagement may at times lead to little accountability in rising operational issues (Vanichchinchai, 2019). Similarly, organizations that already value decentralised operations and the ability to make decisions and act quickly are most likely to achieve success with lean, as employees have an opportunity to be decisive and respond professionally.

Another one of the key drivers of the challenges occurs in the form of resistance to change that organizations experience while pursuing lean manufacturing. People may also resist lean practices because they are aware that such changes may be a danger to their employment, be the cause of additional spending of their time and energy, or the likelihood of upsetting an existing pattern (Deming, 1986). The following paper argue that organizational culture has a critical role to play in this regard. This is due to the fact that the lean environment culture, which involves creating a culture that supports openness to change, ongoing learning, and employee participation can go along way towards preventing resistance and encouraging the acceptance of lean practices (Womack & Jones, 2003).

This paper aims at highlighting the importance of operational efficiency as the core enabler for organizational performance in lean manufacturing and supply chain management environments. Lean manufacturing can be described as a managerial-solution focused strategy aimed at bringing improvements to the manufacturing process and resource utilization. This systematic approach is important in improving the operational capability in supply chain which directly leads to provisions of company performance capabilities (Womack & Jones, 2003). As it has been established, lean manufacturing stemmed from the Toyota Production System (TPS) whose focus was on the elimination of waste or non-value-added activities, and establishment of smooth flow (Liker 2004). Hence, in the textile industries efficiency is important due to competitive and sophisticated business environment, along with increasing cost and customer demands for better productivity. Tools like VSM, TQM and JIT allow a firm to manage its process map and optimise its operations according to the requirements (Shah & Ward, 2007).

Efficiency of Inputs Lean manufacturing strategies deal with efficiency of inputs with which customer needs can be effectively met. Through lean practices, the intended objectives include making work more effective through increasing levels of productivity, besides lowering the amount of money that is spent in the process while at the same time making the material flow through the supply chain easier (Bhamu & Singh Sangwan, 2014). Among the most effective strategies within operational efficiency in lean manufacturing, is the shortening of the cycle times and the inventory levels, because, thereby, companies can promptly satisfy the demands of customers and, at the same time, they minimize the corresponding costs (Fullerton, Kennedy, & Widener, 2014). For instance, in the textile sector of the Pakistani context, companies that have integrated lean principles, like JIT have revealed a vast improvement in terms of operation. JIT has one of the critical effects reducing waste and cost of holding inventory as production is done dependent on the customer requirement (Parveen Mohammad, Rao Tulsiram, 2009). Consequently, it allows the companies to respond to the customer orders and at the same time can minimize holding overstocked inventory that increases the operational costs high.

There does not exist a more significant factor that has will have a tremendous impact on operational efficiency than productivity and waste reduction measures. As a matter of fact, lean manufacturing, as a concept, aims at maximizing productivity by reducing waste and cycles. In Value Stream Mapping (VSM) a lean tool that maps out the production process and the places where wastage occurs include waiting, overproduction, excessive inventory among others is discovered (Rother & Shook, 2009). When these unproductive activities are cut or minimized, then the productivity levels will be improved, and this will be recording an added advantage for textile industries, which are known to barely making profits or recording small profits and great losses due to stiffer incoming competition. **Equipment Utilization** There is also a high measure of efficiency in the operational efficiency, and this measure is in the efficient use of equipment. Lean manufacturing targets the sustainability of the production process with limited interruption, which eventually results in increased usage of the equipment.

An effective approach concerns Total Productive Maintenance (TPM), a lean tool dedicated to reducing downtime and maintaining machines in the best possible conditions, and – as a result – to augment total equipment effectiveness (Seth & Gupta, 2005). This is especially considering in the present industry case with emphasis on the textile industry, where there is the use of machines throughout the production line. (Sundar Raju, Balaji Anand, & Satheesh Kumar R. 2014) noted that companies, which utilize OEE higher, are able to satisfy the customer needs and decrease the expenses on operations.

The Quality Defect is another important part of operational efficiency as it defines the proportion of defective products. In lean manufacturing the system and activities such as TQM are used to reduce defects by incorporating strict quality measures at all stages of the manufacturing process (Deming, 1986). Companies can actually decrease waste rework costs and increase customer satisfaction by getting improvement on the quality of their products. This is especially so for the

textile products where product quality is now a major demonstrable competitive advantage for Pakistan. They observed that a measure of productivity such as lower defect rates will lead to higher customer satisfaction and consequently improved organisational profitability (Parveen Mohammad & Rao Tulsiram, 2009).

Effect on Supply Chain Performance It is a fundamental understanding that in lean manufacturing, operational efficiency is aligned with that of the supply chain. Organization resource utilization, increase in productivity also reduce lead times and increase the on-time delivery and proportionately, increase customer satisfaction (Seth & Gupta, 2005). This means that lean manufacturing makes it easier for the ordering firm to serve its customers by quickly supplying the needed product, thus improving organizations' competitiveness in the marketplace due to shorter response time to changes in customers' demand. When studying the lean tools like JIT and VSM in Pakistani textile sector, it was seen that the firms that effectively applied lean tools showed higher SC efficiency in terms of delivery reliability and low operation cost (Vanichchinchin, 2019).

All in all, operational efficiency is all about the lean manufacturing and supply chain imperative. Lean manufacturing enables companies in the textile industry and other industries to improve resource utilization, reduce wastage and increase equipment effectiveness and decrease the rate of defects hence improving the productivity of the business. Thus, the positive link between lean practices and operational efficiency has emphasized the need to advance in lean implementation principles in an effort to achieve sustainable improvement in organisational performance in line with stepped up competition.

Conclusion

The analysis confirms that the lean manufacturing strategies used within supply chains are positively associated with supply chain performance in the context of developing economies or Pakistan's textiles industry. JIT, TQM, and VSM are some of the lean tools that result in enhanced values for precise supply chain performance measurements for instance, delivery reliability, customer satisfaction indices and the inventory conversion rate. Yet, organizational culture is a mediator and operational efficiency is a moderator of lean implementation success. Companies that have a strong culture of innovation and that empower people and increase supply chain operational effectiveness through process improvements are likely to be the firms that are most likely to improve in supply chain performance. To this end, this study provides novel insights to practitioners and policymaker, a subject that remains underrepresented in the academic literature regarding lean manufacturing in developing economies.

Schematic Diagram

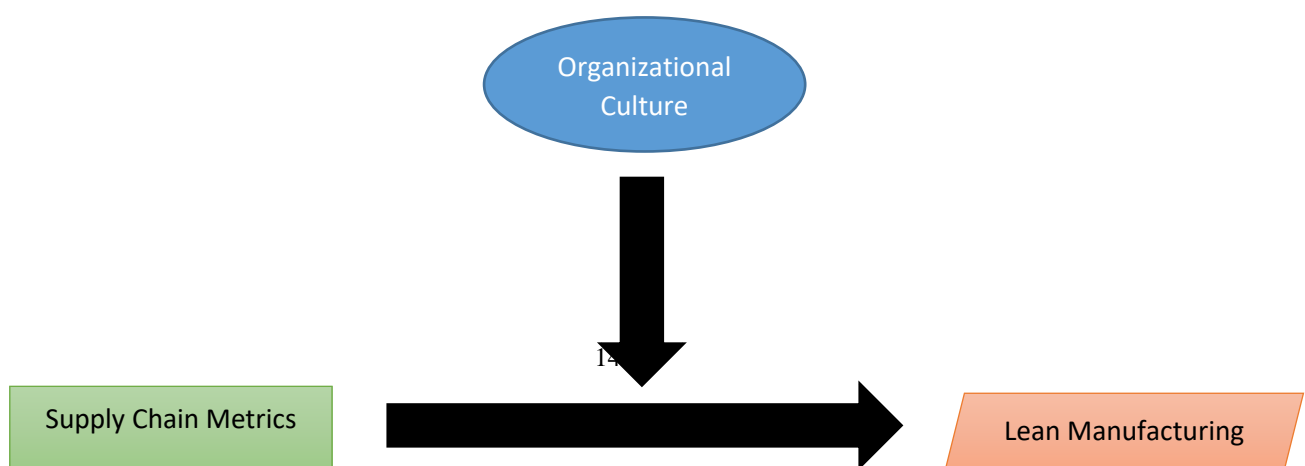


Figure 1.0

Hypothesis

H1: Supply chain metrics (SCM) have a positive and significant impact on lean manufacturing (LM).

The idea central to this hypothesis is that greater application of effective supply chain management practices will increase the degree of enhancements of lean manufacturing results as characterized by waste minimization, increased production efficiency, and superior organizational performance as posited by Shah & Ward (2007).

H2: Organizational culture (OC) positively influences supply chain metrics (SCM).

The spirit of this hypothesis is anchored on the view that culture supports innovation, flexibility and sustained improvement will make supply chain metrics more effective in improving the operational performance. (Hines, Holweg, & Rich, 2004).

H3: Operational efficiency (OE) positively impacts supply chain metrics (SCM).

This hypothesis posits that improving the flow, resource management as well as continuous improvement of operational efficiency will positively enhance supply chain outcomes. (Womack & Jones, 1996).

H4: Organizational culture (OC) mediates the relationship between supply chain metrics (SCM) and lean manufacturing (LM).

This hypothesis postulates that organizational culture is instrumental in enhancing the association between the key logistics indicators and the lean manufacturing scheme by promoting Lean culture practices as well as the consistent enhancement of these practices. (Shah & Ward, 2007).

H5: Operational efficiency (OE) moderates the relationship between supply chain metrics (SCM) and lean manufacturing (LM), such that the positive effect of SCM on LM is stronger at lower levels of operational efficiency.

This hypothesis claims that the impact of SCM on enhancing lean manufacturing results is higher when the operation efficiency is high (Womack & Jones, 1996).

These hypotheses were designed to identify the various interconnections between the factors of SCM, OC, OE, and LM in order to understand how each of them plays a part in enhancing lean manufacturing.

Convenience sampling was used in this study. It enables use to sample respondents who are available and willing to be share their insights on their own will. A target population of 111 participants is selected to includes participants who have adequate experience in lean manufacturing best practices and supply chain management performance. The sample included 71 males (64%) and 40 females (36%), with age distributions as follows: 18-21 years (34.2%), 22-25 years (38.7%), 26-29 years (15.3%), and 30 years and above (11.7%). Regarding marital status, 26.1% of respondents were married, 65.8% were unmarried, 4.5% were divorced, and 3.6% were widowed. Job experiences levels included under probation (25.2%), less than one year (29.7%), one to three years (16.2%), three to five years (18.9%), more than five years (7.2%), and missing data for 2.7% of respondents.

Instrumentation

A questionnaire was used as a tool to collect the primary data. The questionnaire includes Likert-scale questions (measuring attitudes and perceptions) and demographic questions. The Likert-scale items were adapted from validated scales in the literature to ensure the robustness of the data. Reliability testing of the scales was conducted using Cronbach's alpha, which confirmed internal consistency and the suitability of the instrument for further analysis. The finalized questionnaire was distributed through Google Forms and physical surveys to ensure accessibility for a diverse group of respondents.

Lean Manufacturing Practices Scale:

The following scale was adapted from Shah and Ward (2003) and has been commonly used for the evaluation of lean manufacturing adoption and its usage. The scale is comprised of 6 statements assessed with a 7-point Likert scale and focuses on the extent to which organisations perform continuous improvement, pull production, waste minimization and so on. In the original study the coefficient of reliability Cronbach's alpha was 0.85 which indicates that the instrument can be used to evaluate lean practices in different industries.

Supply Chain Performance Scale:

This scale was developed by Li et al., (2005) with items reflecting different aspects of supply chain performance such as delivery reliability, responsiveness, flexibility and overall, Supply chain efficiency. In the first validation study it was found that reliability to was high with an average of alpha levels of 0.80 to 0.90 for all Cronbach's alpha coefficients. Due to the above reasons, existing such this scale looks suitable to be applied for analysing the performance of supply chains in manufacturing settings especially the textile industry.

Organizational Culture Scale:

Organizational cultures were measured using the Denison Organizational Culture Survey developed by Denison (1990). Association of key cultural dimensions such as involvement, consistency, adaptability and mission form the basis of this scale. The scale is made up of 6 items which are answered on a 7-point Likert scale. Subscales with Cronbach's alpha values between 0.70– 0.85 give a reliable measurement of the cultural factors present within the organization

Operational Efficiency Scale:

This scale was adopted from Sambasivan and Fei (2008) who used it to measure the degree of operation efficiency of manufacturing organisations. There are six items, on which participants indicate their level of agreement by responding to statements on a 7-point Likert scale, with statements pertaining to such aspects as cost efficiency, resource allocation, and process improvement. The reliability stated in the original study was .82 signifying excellent internal consistency in estimating efficiency of operation.

All these scales help increase methodological reliability of the study as they are specific tools that correspond to the research aims. The reliability and validity of these scales have however been confirmed, thus making them fit for use within the context of the Pakistani textile industry.

Unit of Analysis

Primary and secondary data were obtained at the individual level and involved the assessment of lean manufacturing practices and supply chain performance. They included demographic variables such as experience in the job and lean manufacturing activities. Since the subjects were identified to bear operational or managerial duties, the study was meant to obtain information regarding JIT and TQM and their implementation within a supply chain system and the impacts they impose.

Inclusion Criteria

The participants for this study were recruited based on inclusion and exclusion factors in order to establish their relevance to the study and to increase the validity of the results produced. The selection criteria simply stipulated that all participants must be employees currently working in the Pakistani textile sectors in the supply chain or production-line capacities or in any other functional areas that have responsibility for manufacturing. Furthermore, the respondents must have two years of work experience in the positions concerned with production, supply chain or manufacturing improvement. The survey targeted only those employees of the organizations that had adopted, or in the process of adopting, some of the lean manufacturing tools including Just-in-Time and Total Quality Management.

Exclusion Criteria

Respondents with no working experience in the textile industry or those respondents whose job description did not involve production or supply chain responsibility were excluded. This exclusion also encompassed the employees working in other organizational departments that do not involve manufacturing for example administrative and sales employees. Consequently, respondents from organisations that had not implemented any form of lean manufacturing were eliminated, along with those who could not or would not sign up for the research. During these studies, the authors employed this selective approach to guarantee that the collected data were responses of the subject to queries about lean manufacturing and its effects on supply chain performance.

Research Design

This research work adopted an analytical cross-sectional and causal research design. Thus, the data for this study were collected quantitatively to establish the effects of lean manufacturing practices on the supply chain performance in Pakistani textile sector. Cross-sectional data were obtained with a structured questionnaire delivered at a point in time to employees drawn from

operational positions in the textile firm. The study sought to establish cause-effect link between the application of lean manufacturing tools and Supply chain performance indicators, namely, order accuracy, inventory velocity, lead time and customer satisfaction where tools like Just-In-Time, Total Quality Management were used. Failure patterns were tested as the dependent variable, operational efficiency as the mediating variable, and organizational culture as the moderating variable. The research hypotheses were the foundation for the examination of the variables so the collection of quantitative data was analysed using PROCESS HAYES in IBM SPSS 27 to check the validity of the hypotheses. Frequencies using descriptive analysis was also used to demonstrate demographic items.

Data Analysis

Demographics- (Descriptive Statistic)

		Number	%
Gender	Male	71	64.0
	Female	40	36.0
Total		111	100
Age	18-21	38	34.2
	22-25	43	38.7
	26-29	17	15.3
	30 and above	13	11.7
Total		111	100
Marital status	Married	29	26.1
	Unmarried	73	65.8
	Divorced	5	4.5
	Widowed	4	3.6
Total		111	100
Job Experience	Under Probation	28	25.2
	Less than 1 year	33	29.7
	1 to 3 years	18	16.2
	3 to 5 years	21	18.9
	More than 5 years	8	7.2
	Missing System	3	2.7
Total		111	100
	150		

The majority of the respondents were male (N = 71, 64%). Regarding age, most respondents were between 22-25 years old (N = 43, 38.7%), followed by 18-21 years old (N = 38, 34.2%). A significant portion of respondents were unmarried (N = 73, 65.8%) and widowed (N=4,3.6%) were almost absent. Additionally, most respondents had less than one year of job experience (N = 33, 29.7%) followed by the respondents who were under probation (N = 28, 25.2%). Very few numbers of respondents were replied with more than 5 years of experience.

Based on the demographic data, the sample appears to be representative of a young, predominantly male, unmarried population with limited job experience.

Table 2 – Reliability Analysis

Variable	Cronbach's Alpha	N of Items
Lean Manufacturing	.702	5
Supply Chain Metrics	.707	5
Organizational Culture	.690	6
Operational Efficiency	.696	5

Referring Table 2 the data is reliable for each of the item at Cronbach's $\alpha > .6$ and this is according to the understanding given by Nunnally (1978). It is pertinent to mention items were deleted to improve the reliability of the data. In case of lean manufacturing (dependent variable) the item 1 was deleted to increase the reliability of Cronbach alpha from $\alpha = .698$ to $\alpha = .702$. Referring to supply chain metrics (independent variable) item 1 was deleted to increase the reliability of Cronbach's alpha from $\alpha = .698$ to $\alpha = .707$. For organizational culture (mediating variable) no items were deleted as highest value of Cronbach's alpha was already selected. In case of operational efficiency (moderating variable) the item 1 was deleted to increase the reliability of Cronbach alpha from $\alpha = .693$ to $\alpha = .696$.

Regression Analysis (PROCESS HAYES MACRO v4.2)

Moderation and Mediation Analysis

Therefore, by using the PROCESS macro-Model 5 (Hayes, 2022), the moderating effect of the OE and the mediating effect of the OC between the SCM and LM were investigated. The data participants comprised a sample size of N=111 and the data is summarized below.

Outcome Variable: Organizational Culture (OC)

The regression model predicting **OC** from **SCM** was significant, $F(1,109) = 1031.52$, $p < .001$, $F(1,109) = 1031.52$, $p < .001$, $R^2 = .904$, indicating¹⁵¹ that 90.4% of the variance in **OC** was explained

by **SCM**. **SCM** was a significant positive predictor of **OC**, $b=.898$, $SE=.028$, $t(109)=32.12$, $co-eff=.898$, $SE=.028$, $t=32.12$, $p<.001$, 95% CI [.843,.954].

Outcome Variable: Lean Manufacturing (LM)

The regression model predicting LM from SCM, OC, OE, and the interaction term ($SCM \times OE$) was significant, $F(4,106)=10,007.49$, $p<.001$, $F(4,106)=10,007.49$, $p<.001$, $R^2=.997$, $R^2=.997$, explaining 99.7% of the variance in LM. The following results were observed:

SCM significantly predicted LM, $co-eff=.594$, $SE=0.071$, $t(106)=8.38$, $p<.001$, $coeff=.594$, $SE=0.071$, $t(106)=8.38$, $p<.001$, 95% CI [0.454,0.735].

OC significantly predicted LM, $co-eff=.049$, $SE=0.018$, $t(106)=2.66$, $p=.009$, $coeff=.049$, $SE=0.018$, $t(106)=2.66$, $p=.009$, 95% CI [0.013,0.086].

OE significantly predicted LM, $co-eff=.615$, $SE=0.061$, $t(106)=10.03$, $p<.001$, $coeff=.615$, $SE=0.061$, $t(106)=10.03$, $p<.001$, 95% CI [0.493,0.736].

The interaction term ($SCM \times OE$) was significant, $co-eff=-0.028$, $SE=0.011$, $t(106)=-2.59$, $p=.011$, $coeff=-0.028$, $SE=0.011$, $t(106)=-2.59$, $p=.011$, 95% CI [-0.049, -0.007].

Conditional Effects of SCM on LM at Different Levels of OE

The conditional effects of **SCM** on **LM** were significant at all levels of **OE**:

At $OE=4.0$: $OE=4.0$: $Coeff=0.484$, $SE=0.047$, $t(106)=10.36$, $p<.001$, $coeff=0.484$, $SE=0.047$, $t(106)=10.36$, $p<.001$, 95% CI [0.392,0.577].

At $OE=4.6$: $OE=4.6$: $Coeff=0.468$, $SE=0.046$, $t(106)=10.28$, $p<.001$, $coeff=0.468$, $SE=0.046$, $t(106)=10.28$, $p<.001$, 95% CI [0.378,0.558].

At $OE=5.0$: $OE=5.0$: $Coeff=0.457$, $SE=0.045$, $t(106)=10.12$, $p<.001$, $coeff=0.457$, $SE=0.045$, $t(106)=10.12$, $p<.001$, 95% CI [0.367,0.546].

Indirect Effect of SCM on LM through OC

The indirect effect of SCM on LM through OC was significant, $Effect=0.044$, $BootSE=0.025$, $Effect=0.044$, $BootSE=0.025$, 95% CI [0.000,0.093]. The completely standardized indirect effect was $Effect=0.044$, $BootSE=0.025$, $Effect=0.044$, $BootSE=0.025$, 95% CI [0.000,0.093].

Discussions

Interpretation

H1: Supply Chain Metrics and Lean Manufacturing

The first hypothesis postulated that supply chain metrics (SCM) will have positive, significant effect on lean manufacturing (LM). In line with this hypothesis, the results of the present study affirmed that the management of inventory, demand forecast, and supplier integration bear a lot of importance in enhancing lean manufacturing results. This result supports prior studies wherein it was found that application of sound and relevant supply chain management indices helps organisations in minimising costs, rationalising the supply chain, and increasing operational efficiency (Shah & Ward, 2007). This positive association implies that organizational members can achieve immediate and considerable enhancement of lean manufacturing competency for companies that consecrate resources in cleansing up supply chain practices.

H2: Organizational Culture and Lean Manufacturing

The second hypothesis tested the moderating role of organizational culture (OC) on lean manufacturing (LM). Research findings indicated a positive insignificant relationship between the extent of support for lean practice and the level of implementation of lean practice. The cultures that have been characterised by the promotion of innovation, flexibility and improvement were seen to boost the lean manufacturing effectivity and effectiveness. These results support previous research that discusses the role of the organization culture for increasing operational performance and creating an environment that supports lean understanding (Hines, Holweg & Rich, 2004). Therefore, there is a need to develop and maintain sound and flexible organizational culture in order to reap maximum advantage from lean manufacturing processes.

H3: Operational Efficiency and Lean Manufacturing

The third hypothesis concerned the direct relationship between OE and LM. The findings indicated that higher increases in productivity, for example, the rational use of resources and the introduction of standard procedures for a company's activities facilitate better operations of lean production processes. This provides the basis for the argument that efficiency or at least the efficiency initiatives enable better lean practice, which in turn leads to cycle time reduction, cost reduction, enhanced quality (Womack & Jones, 1996). Fortunately, the article is able to establish the fact that there is a positive correlation between operation efficiency and lean manufacture in support of this it stresses the need to enhance on operations for effectiveness in lean success.

H4: Organizational Culture as Mediator

Fourthly, the authors hypothesized that OC fully mediates SCM and LM. The findings confirmed this hypothesis that sound and positive organizational culture strengthens the correlation of the supply chain metrics in relation to lean manufacturing. This paper also established that organizational culture facilitated supply chain improvement to be integrated into lean practices easily. Based on the nature of this mediation argument, strategic culture firms are likely to reap maximum benefits of supply chain metrics to enhance the lean manufacturing performance as highlighted by Shah and Ward (2007).

H5: Organizational Culture as Moderator

The last hypothesis compared the degree to which operational efficiency or OE mediates SCM and LM relationships. The findings provided evidence to support the hypothesis that operational efficiency moderates this relationship such that supply chain metrics enhance lean manufacturing where operational efficiency is low. It also implies that organisations that are less efficient operationally have more to gain from using supply chain metrics to complement their lean manufacture gains. The slow ratio of supply chain improvements points to the idea that SCM is most effective in organizations with lower levels of operational excellence as the rate of improvement in metrics reduces (Womack & Jones, 1996).

Implications for Theory and Practise

This research provides important recommendations to the advancement of LM and SC theories alongside the enhancement of organisational performance. Conceptually, it expands knowledge of the relationship between supply chain metrics (SCM), organizational culture (OC), and operational efficiency (OE) for lean manufacturing. This paper contributes to the body of literature to emphasize on OC as a mediator; strengthen the link between SCM and LM to recommend that OC, enthusiastic in innovations and improvements, create flexibility for effective implementation of lean. The study also used OE as a moderator which means SCM practices are most effective when operative efficiency is low; this provides some depth to our understanding of when and how SCM affects lean performance. Finally, it has been assumed that implications of the study can be methodological relevant for managers and practitioners. Any organization that requires enhancement of the produced lean manufacturing paradigm should avoid concentrating on the supply chain alone but also avail an environment that enters the lean manufacturing paradigm. The enhancement of the positive impact of SCM on LM can be attained by developing a culture that supports improvement, innovation and flexibility. Furthermore, the extent to which the improvement of SCM practices affects the businesses is related to their operational efficiency; consequently, companies with lower operational efficiency should pay extra attention to the improvement of SCM practices. In conclusion, the research aims and findings convey the fact that lean manufacturing should be considered as a whole system in an organization and comprising of key supply chain manufacturing measures, personnel culture and frequent emphasis on efficiency.

Limitations and Suggestions

Limitations

While this study offers important insights into the relationship between supply chain metrics (SCM), organizational culture (OC), operational efficiency (OE), and lean manufacturing (LM), several limitations should be acknowledged:

Sampling Bias:

The study limited the use of sample and the selection of participants through convenience sample making the results prone to bias. This in turns restricts the extent to which the results can be generalized to the rest of the population. The generalization of the findings should be further explored in the next studies by means of LSKS utilizing random sampling methods.

Small Sample Size:

Because of the time constraint, we were unable to reach a large number of participants; the sample size was only 100. Overall, this was sufficient if the purpose was only to perform primary analysis but a larger sample would better act as a confirmation of the results. In future, the sample size should be increased, so as to get even more comprehensive results and more power.

Cross-Sectional Design:

The cross-sectional research design was adopted for the study which crafted a picture of the interdependence of the variables under study but cannot support causality conclusions. Longitudinal research designs should be used in future studies to determine how these relations change with time and the consequent impacts.

Self-Reported Data:

This brings out an issue with self-report data that was used in this study, that of self-report bias such as social desirability bias. There is always the possibility that the responses received are those which the respondents felt was expected from them. As for the limitation, it is suggested in the future studies, the researcher could also collect objective data or use multiple modes of data collection thereby increasing the validity of the conclusion.

Suggestions for future work

Exploring Industry-Specific Variations:

Future research should seek to establish the differences in the relationships between SCM, OC, OE, and LM, within different industries. Perhaps more detailed comparisons should be taken by exploring the effects of lean practices in terms of different industry specifics might help to unearth more helpful information on how lean practices are most effectively introduced across industries.

Longitudinal Studies:

Because cross sectional approaches have their limits, the use of longitudinal research designs should be recommended in future studies to assess the changes in performance outcome of lean manufacturing over time. This would give a better view on the sustainable effect of SCM, OC, and OE on the implementation of LM.

Exploring Additional Mediators and Moderators:

However, based on the context of this current study in which organizational culture was used as the mediator variable and operational efficiency as the moderator variable, there are other

variables that could be used in future research such as leadership, levels of Engaging employees, and technological implementation levels affecting the relationship between SCM and LM.

Incorporating Objective Data:

The overall research could be benefited from the constructing of more objective measures, like, performance indicators or accounting data that could have been used to substantiate the constructs proposed in the next studies. This would also eliminate some of the biases with self generated data, and offer a clearer picture of lean manufacturing results.

Comparative Studies Across Regions:

The results obtained are therefore generalisable only to a certain geographical location of the study sample. As for the future research, it is suggested that the studies done cross-sectional by comparing the results achieved in different regions or countries to disclose the outstanding cultural and market impacts on the relations between SCM, OC, OE, and LM.

Investigating Barriers to Implementation:

Subsequent research should elaborate the challenges that organizations encounter during the SCM, OC and OE for efficient lean manufacturing. Knowledge of the factors which can hinder the process of proper implementation may be helpful for practitioners who are interested in improving lean management in organizations.

Conclusion

Just-in-Time (JIT), Total Quality Management (TQM), and Value Stream Mapping (VSM) have been integrated and shown in this research to enhance on the supply chain performance of textile industry in Pakistan. Through waste cutting, improving delivery precision, sustaining shorter cycle times, and raising customer satisfaction, lean practices present a strong model for operational improvement. This research also establishes operational efficiency as a mediator and multiplied the impact of lean tools on performance as well as lean culture as an antecedent of lean improvement initiatives.

Lean manufacturing strategies can only be fully implemented in organizations that are innovation-led with decentralizing and empowered employees' cultures. This therefore implies that in addition to the technical enablers of the lean practices, the organisational cultural enablers are critical underpinnings for the sustainable success of the measures aimed at enhancing the supply chain performance.

The research also addresses a significant research gap in comprehending lean manufacturing within the developing environment of the Pakistan textile industry. This would generate important information for industry leaders interested in improving their competitiveness. To build a better picture of lean's potential across the globe future research needs to analyse its use in the long run, but also extend its examination to other sectors.

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An Insight into Foreign Exchange Rates of currencies traded in Pakistan

Tehmina Fiaz Qazi

Hailey College of Banking and Finance
University of the Punjab, Lahore, Pakistan

Abdul Aziz Khan Niazi

Department of Management Sciences, New Campus,
University of Engineering and Technology, Lahore, Pakistan

Suleman Sami Qazi (Corresponding Author)

Department of Electrical Engineering,
University of Engineering and Technology, Lahore, Pakistan

Abstract

The aim of the study is to analyze the monthly average foreign exchange rates of nine different currencies traded in terms of Pak-rupees over the last thirty years in Pakistan. The design of the study encompasses to survey and review of current research studies, data gathering, and analysis. The study follows the positivist philosophy of research and a deductive approach. The data of average monthly foreign exchange rates of Saudi Arabian Riyal, UAE Dirham, US Dollar, Canadian Dollar, UK Pound Sterling, EURO, Japanese Yen, Swiss Franc, and Deutsche Mark to Pak-rupees is obtained from the central bank of Pakistan for the period of last thirty years. The technique employed is wavelet analysis using the wavelet toolbox of MatLab software. The results of the study provide a lot of new insights having propounding practical and theoretical implications for the economists, the political government of Pakistan, researchers, and analysts.

Keywords: Foreign Exchange Rates, Wavelet Analysis, Monthly Average Foreign Exchange Rates, Pakistan, Wavelet Transform

Introduction

Interest and inflation rates are high on the agenda of economist researchers. Apart from interest rates and inflation rates, the currency exchange rate is also one of the vital factors in a country's economic health. The high-valued local currency makes imports of the country less expensive at home and the exports of the country more valuable in foreign markets. Degong, et al. (2023) asserted that exports have no significant effect on outward direct foreign investment in the short run. Azher, & Iqbal, (2016) argued that exchange rate risk is priced particularly in the Pakistani equity market over full sample period. It is also found that there is Pakistani equity market is segmented by world markets. Farid, et al. (2023) concluded that the "FDI-based endogenous-growth-theory" is typically valid in Pakistan's case. Foreign exchange rates in Pakistan have become the most critical economic indicator for last three to four decades. Analysis of foreign exchange rates in Pakistan is one of the most important and common topic of investigation. It is one of the most frequently analyzed issue for but with usual econometric techniques i.e. correlation coefficient, GARCH models, Copula models, Fama–French models, etc. The authors could not find any study that uses wavelet model or other appropriate alternative model that has the capability to capacity to extract local spectral and temporal information concurrently, excellent localization properties. The study is therefore designed to fill this gap. There is severe need to overcome limitations on timeliness and sample size of surveys, and empirical research and to analyze the localization properties of the phenomenon. Research objective is to analyze the monthly average foreign exchange rates of nine different currencies traded in terms of Pak-rupees over the last thirty years in Pakistan. The authors considered different methods to address

the issue at hand viz DEA, DEMATEL, ISM, MICMAC, Regression Analysis, RIDIT analysis, Wavelet analysis, Weighted Process Modeling, etc., and find it appropriate to use wavelet analysis to achieve the objective of the study (Qazi, et al., 2023; Tariq, et al., 2023; Qazi, Niazi, Mirza, Basit, & Saleem, 2023; Farid, et al., 2023; Shaukat, et. al., 2023; Aziz, et al., 2023; Niazi, et al., 2023; Niazi, Saleem, Basit, Iqbal, & Khan, 2023; Niazi, Qazi, Aziz, Basit, & Niazi, 2023; Qazi, Niazi, Mahmood, Basit, & Niazi, 2023; Naeem, Muhammad, & Niazi, 2021; Ali, Mushtaq, Niazi, & Raza, 2021; Basit, Qazi, & Khan, 2021; Qazi, Niazi, & Basit, 2020; Faraz, Niazi, & Zafar, 2020; Niazi, Qazi, & Basit, 2019; Basit, Niazi, Qazi, & Imtiaz, 2019; Niazi, Qazi, & Basit, 2019; Haq, et al., 2018; and Basit, Qazi, & Niazi, 2020). Wavelet analysis used in wide variety of fields like medicine (Qassim, et al. 2013; Hassan, et al. 2010; Scholkmann, & Dommer, 2012), geophysics (Liu, Hsu & Grafarend, 2005; Zamani, Samiee & Kirby, 2013; Grinsted, Moore & Jevrejeva, 2004), astrophysics (Li, Gao & Zhan, 2009; Bloomfield, et al. 2004; Donner & Thiel, 2007; Kelly, et al. 2003) etc. It is also frequently used for research in the field of neuroscience, wind engineering, industrial aerodynamics, finance, biology, medicine, economics, meteorology, energy, computer science, engineering, electronics & telecommunication, management sciences, social sciences, acoustics, geodynamics, laser physics and nuclear science, signal processing, engineering, medical sciences, astronomy, project management, energy, manufacturing, engineering, research and development, insurance, oil & gas, transportation, geology, geophysics, oceanology, music, and environmental science. The wavelet transform has many advantages over the traditional methods like: capacity to extract local spectral and temporal information concurrently, excellent localization properties, overcome limitations on timeliness and sample size of surveys, and empirical research (Crowley & Mayes 2009; Rua & Nunes 2009). Remainder of the study is review of literature, research method, analysis, results, & discussion, and conclusion.

Literature Review

The literature review is necessary for research because it improves methodology choices, broadens knowledge base about the topic, and states findings of existing studies, guides the further research studies. Therefore, most of the renowned online research databases viz ScienceDirect, MDPI, Frontiers, DOAJ, PLOS, Wiley Black-Well, Taylor & Francis, Ebsco-Host, Springer, Emerald-Insight, JStor etc. are explored using keywords exchange rates in Pakistan, exchange rates, foreign exchange rates, etc. a large number of studies is found, downloaded, and critically reviewed. Some of them are reported here to build the context of the current study. Akbar, & Ahmad, (2021) stated that exchange rate depreciation is a source of shock rather than shock-absorber in Pakistan's economy. Naveed, et al. (2024) bolstered that there is a strong nexus between the forex and foreign exchange- derivatives' markets of Pakistan. Brun, Gambetta, & Varela, (2022) concluded that export adjustments after the depreciations are relatively less than one-third as fast as those to appreciations in case of Pakistan Hordofa, (2023) emphasized that the remittance demonstrates transient significance, highlighting that there is the need for cautious policy considerations in Asia. Khalid, et al. (2023) concluded that both the overvaluation of currency and the undervaluation of currency impedes economic growth. Chaudhary, Hashmi, & Khan, (2016) described that a long-term relationship between exchange rate & exports exists, however, relationship among exchange rate and imports are found only few cases. Caporale, et al. (2017) bolstered that high or low exchange rates' volatility is associated with equity inflows. Grossmann, Paul, & Simpson, (2017) asserted that there is a negative relation between undervalued US dollar and foreign equities. He, Wang, & Yu, (2023) buttressed that internationalization reduces firms' exposure to exchange rate fluctuations of Asian currencies. Kiani, (2013) found that there is statistically significant evidence of volatility clustering and the exclusion of conditional-heteroskedasticity from forecasting models leads to false statistical inference in favor of no time varying-risk-premium. Bresser-Pereira, Feijó, & Araújo, (2025)

reached to conclusion that criticizes John Williamson's concept of 'fundamental equilibrium', which assumes a 'sustainable' current-account deficit. It shows that deficits not only causes currency crises, but also involve long-term appreciation of exchange rate that makes non-competitive production in the economy.

Methods and Materials

On the positivism research paradigm the study follows deductive approach of research philosophy. The research design is review if literature, data elicitation and analysis. It is a case study of Pak-Rupee as against Saudi Arabian Riyal, UAE Dirham, US Dollar, Canadian Dollar, UK Pound Sterling, EURO, Japanese Yen, Swiss Franc, and Deutsche Mark. The data of monthly average foreign exchange rates in Pakistan for the last thirty years is obtained from the central bank of Pakistan. The method of analysis is wavelet transform following the classical mathematical algorithm. Wavelet has an exceptional potential to capture the non-stationary behavior and time-varying trends present in the time series data (Aloui & Hkiri, 2014; Aloui, et al., 2018; Aloui, Hkiri & Nguyen, 2016). The analysis is performed on MatLab software using the built-in functions of wavelet tools in MatLab. It is very useful method for waves' propagation, data compression, and signal processing in time series analysis.

Analysis and Results

Analysis has been performed on the aforementioned data set through wavelet analysis (individual wavelet power spectrum both on frequency and time domain) and the variations have been captured on color scale. The skip table of the data is given below as Table 1.

Table 1: Dataset Foreign Exchange Rates

Series Name	Unit	30-Sep-19	31-Aug-19	-	-	31
Monthly Average Exchange Rates - Saudi Arabian Riyal	Rs./ Saudi Riyal	41.6286	42.1359	-	-	5.
Monthly Average Exchange Rates - UAE Dirham	Rs./ UAE Dirham	42.5145	43.0307	-	-	5.
Monthly Average Exchange Rates - US Dollar	Rs./US \$	156.1764	158.0770	-	-	21
Monthly Average Exchange Rates - Canadian Dollar	Rs./Canadian \$	117.7828	119.0339	-	-	18
Monthly Average Exchange Rates - UK Pound Sterling	Rs./UK Pound	192.7554	192.1975	-	-	34
Monthly Average Exchange Rates - EURO	Rs./EMU Euro	171.8118	175.5356	-	-	
Monthly Average Exchange Rates - Japanese Yen	Rs./ ¥	1.4529	1.4855	-	-	0.
Monthly Average Exchange Rates - Swiss Franc	Rs./Swiss Franc	26.1925	26.7602	-	-	3.

The individual wavelet power spectrum transform (wavelet analysis) is employed as a scheme of investigation of variations in the forging exchange rate of Saudi Arabian Riyal, UAE Dirham, US Dollar, Canadian Dollar, UK Pound Sterling, EURO, Japanese Yen, Swiss Franc, and Deutsche Mark as against Pak rupee. The analysis enlightens upon localization of the variations in exchange rates in frequency-time domains during the sample period (i.e. November 30, 1989, to September 30, 2019). The dataset is formed of monthly average exchange rates. Figures 1-9 are contour spectra having three different variables presented on three different scales and axes. Months/years on x-axis, frequency on y-axis, and intensity of variation color-axis. Wavelet transform frequency scale varies from 4-64 (high to low), time in month/years, and intensity at color scale (dark blue being low intensity to dark red being high intensity). The variations can be observed on color intensity over the sample period contrary to different levels of wavelet frequency. All spectra i.e. Figures 1-9 follows the same scheme of presentation.

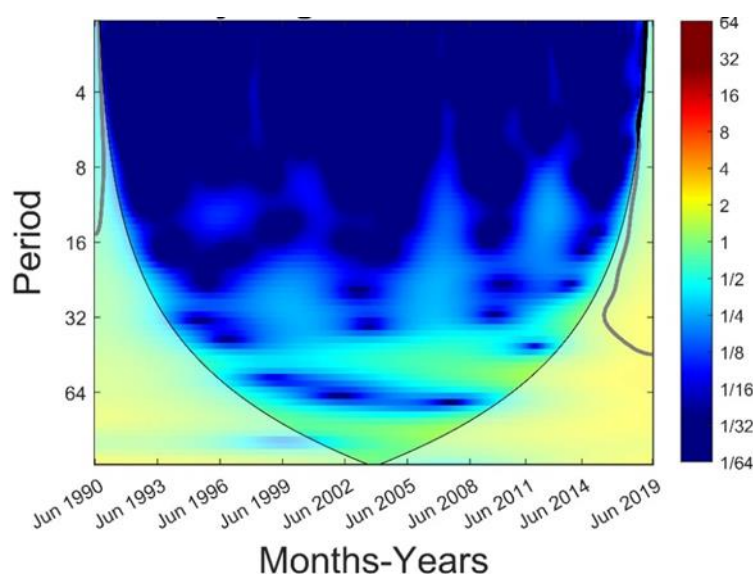


Figure 1: Wavelet Power Spectrum of Monthly Average Forex Rates – Saudi Arabian Riyal

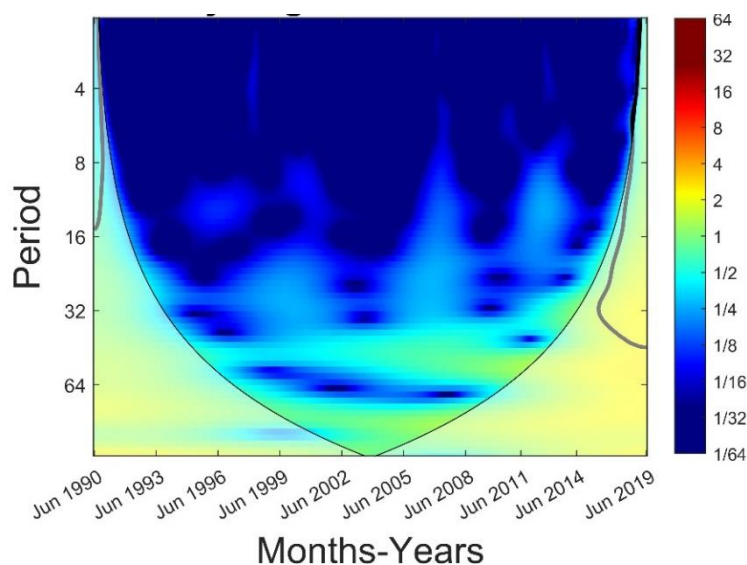


Figure 2: Wavelet Power Spectrum of Monthly Average Forex Rates – UAE Dirham

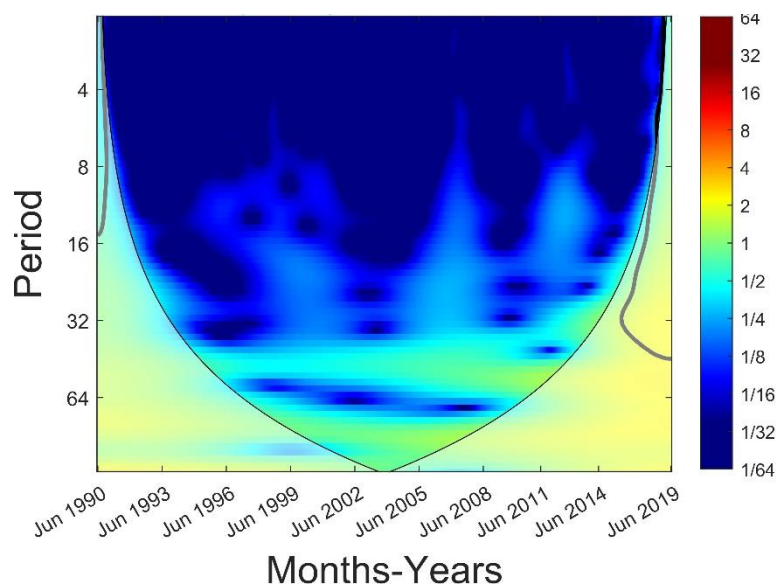


Figure 3: Wavelet Power Spectrum of Monthly Average Forex Rates – US Dollar

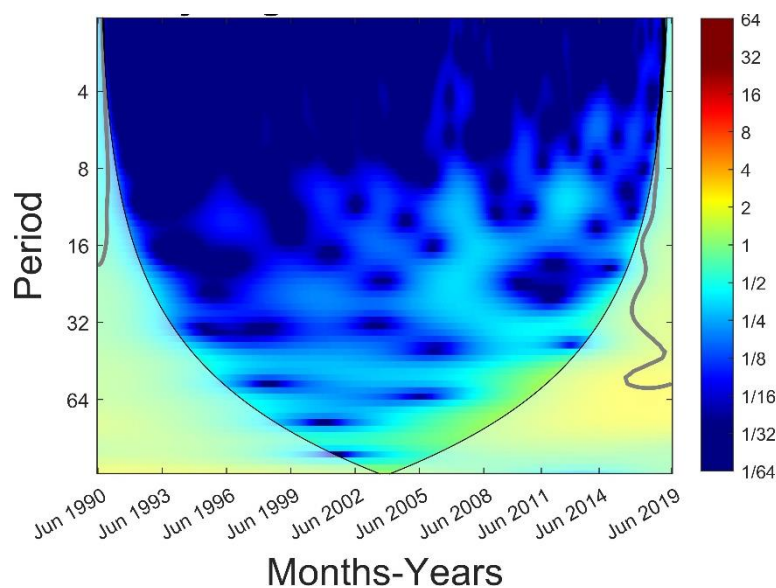


Figure 4: Wavelet Power Spectrum of Monthly Average Forex Rates – Canadian Dollar

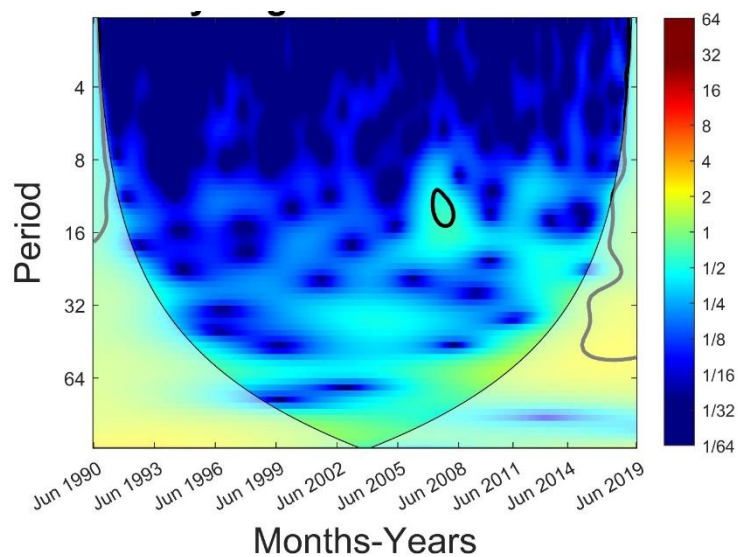


Figure 5: Wavelet Power Spectrum of Monthly Average Forex Rates – UK Pound Sterling

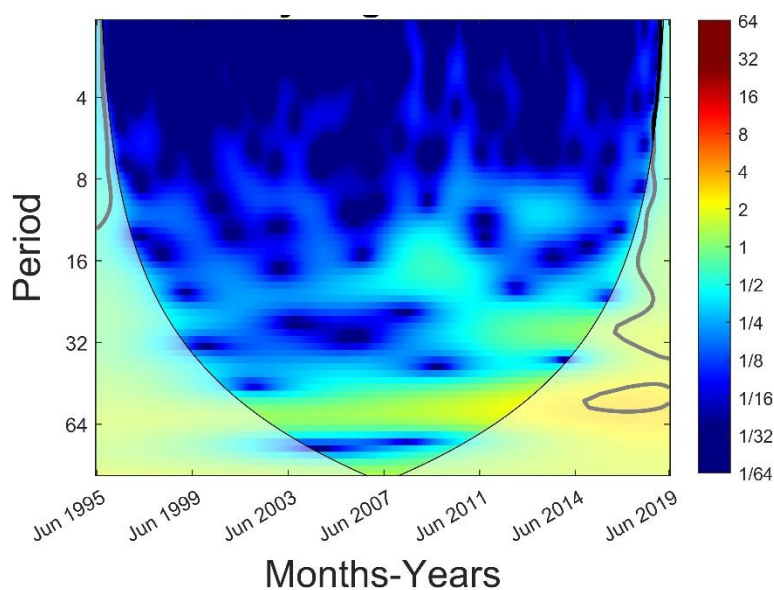


Figure 6: Wavelet Power Spectrum of Monthly Average Forex Rates – Euro

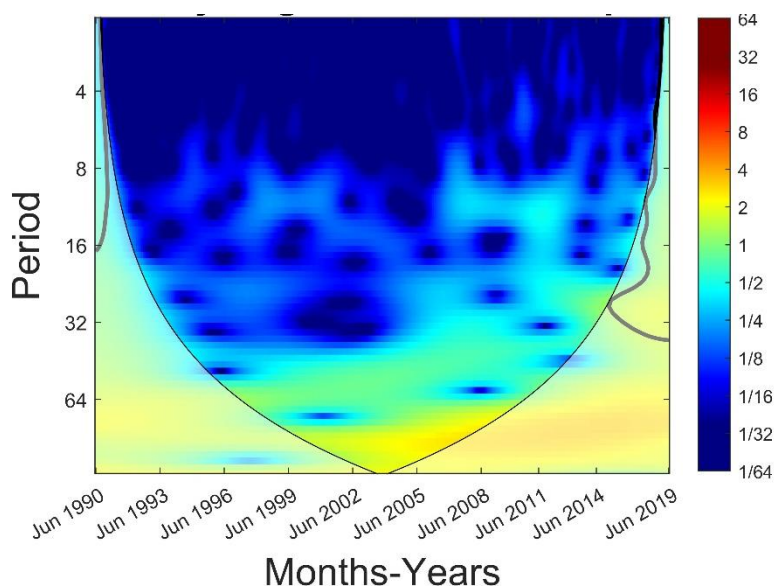


Figure 7: Wavelet Power Spectrum of Monthly Average Forex Rates – Japanese Yen

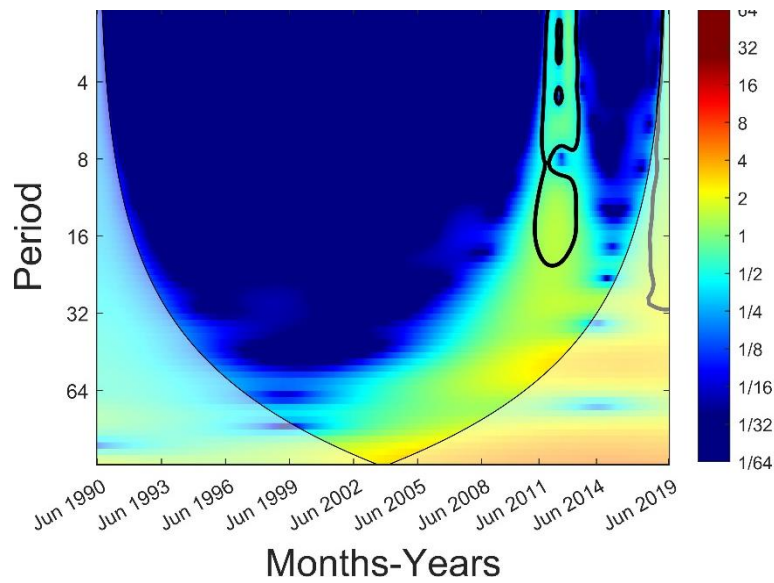


Figure 8: Wavelet Power Spectrum of Monthly Average Forex Rates – Swiss Frank

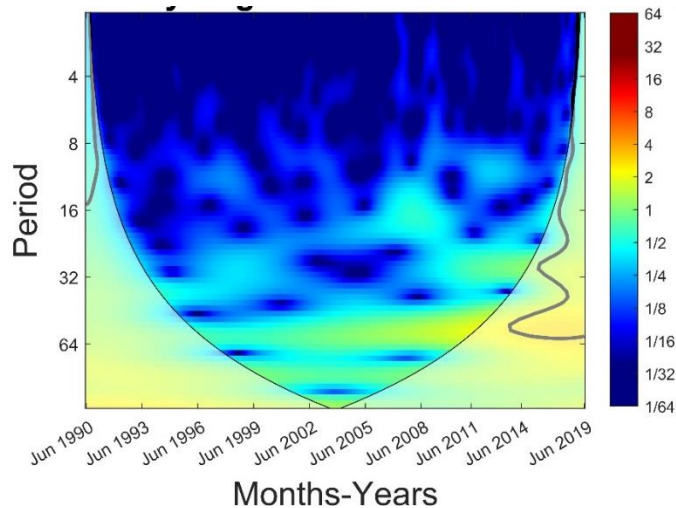


Figure 9: Wavelet Power Spectrum of Monthly Average Forex Rates – Deutsche Mark

From the wavelet power spectra (Figures 1-6) of the variables (Table 1), aforementioned, it can be observed that the color encryption ranges from dark blue to dark red. Dark blue represents low- power, whereas, dark red shows high power. A thick black outline is called COI (cone of influence) that enfolds regions of 5% cumulative area-wise significance. Time (months/years) and frequency (periods) are represented on the horizontal axis (x-axis) and vertical axis (y-axis), accordingly. The inspection of wavelet power spectra of exchange rates (Figures 1-7 and 9) of Saudi Arabian Riyal, UAE Dirham, US Dollar, Canadian Dollar, UK Pound Sterling, EURO, Japanese Yen, and Deutsche Mark as against Pak rupee have a similar type of intensity of variations localized on frequency and time over the sample periods except that of the Swiss Franc (Figure 8). The Swiss Franc has different behavior particularly around the year 2011 as evidenced by a contour spread at 4-32 wavelet frequency a mild color scale of intensity.

Discussion and Conclusion

Analyzing the foreign currency exchange rate over the period has always been high on the agenda of research for years. Therefore the problem under study is the investigation of variation of exchange rates of Pak Rupees with eight important foreign currencies as mentioned in Table 1. The technique of investigation used is individual wavelet power spectrum. The results show that

The inspection of wavelet power spectra of exchange rates (Figures 1-7 and 9) of Saudi Arabian Riyal, UAE Dirham, US Dollar, Canadian Dollar, UK Pound Sterling, EURO, Japanese Yen, and Deutsche Mark as against Pak rupee have a similar type of intensity of variations localized on frequency and time over the sample periods except that of the Swiss Franc (Figure 8). The Swiss Franc has different behavior particularly around the year 2011 as evidenced by a contour spread at 4-32 wavelet frequency a mild color scale of intensity. Wavelet power spectra of monthly average exchange rates Saudi Arabian Riyal, UAE Dirham, US Dollar, Canadian Dollar, UK Pound Sterling, EURO, Japanese Yen, Swiss Franc, and Deutsche Mark as against Pak rupee is the contribution of the study towards the literature. It has deep practical and theoretical implications because its findings are useful for international community, individuals, analysts, institutions, and policymakers, by offering insightful information on the phenomena. It is a primary study by the authors and it is subject to certain limitations like: the dataset is relatively limited to shorter period. It has generated wavelet power spectra and authors intend to extend the analysis to further variants of wavelet transform (i.e. create cross-wavelet transform, wavelet coherence transform spectra etc.). It is based on a limited number of currency exchange observations. Therefore, findings of the research are useful in the light of these observation. Future studies should try to overcome the limitations mentioned hereinabove.

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Impact of Financial Literacy & Gender Preferences on Stock Market Participation with reference to Risk Attitude

Dr. Muhammad Usman

HCBF, PU, Lahore

Yusra Malik

HCBF, PU, Lahore

Dr. Samar Rahi

HCBF, PU, Lahore

Abstract

Indispensable basis of this paper is to develop framework through which we can manage the role of Financial Literacy (FL), Gender, risk attitude (RA) while making plans for stock market participation (SMP). Conceptual paper stated under tells how stock market participation (SMP) is affected by gender having different level of financial literacy (FL). This paper tells us basic financial literacy (BFL) plus advanced financial literacy (AFL) positively affects SMP. With reference to gender, females invest less in SMP. It also explains risk behavior towards monetary decisions. Whereas; the novelty of this paper is the considerable role of Risk Attitude (RA) with relation to the gender. The data survey was conducted in different public and private sector Universities in Lahore city. We have distributed 300 questionnaires among students and received 200 questionnaires with valid response which we have used for data analysis. This study can contribute in existing literature to understand the role of financial literacy and gender in stock market participation with reference to the impact of risk attitude.

Key words: Stock market participation, Basic financial literacy, Advance financial literacy, Risk attitude, gender

Introduction

Stock market participation (SMP) carries great value in regard to verdicts related to economy. It can be opulent to not partake in the stock market because capital recompense might be necessary determinative of long-run returns to person's frugal. There's a gender gap in SMP, which may be minimize by upbringing basic financial literacy among women. Female sector invests less in SM with relation to men. Simultaneously, female squads have (FL) than male squad.

Some studies explained a direct link among motivation and (SMP), contrary to this, negative relation linking self perception and (SMP). Pertaining to (SMP) when risk and return is main concern, intellectual capacity, and financial recognition is effective way to handle risks.

Policy developers have comprehended that (FL) is crucial antitoxin to the enlarged entanglement of individuals' financial determination throughout previous few decades. Meta-analysis between fiscal learning and financial knowledge showed effective impact on (SMP). The fragmentary impact of (FL) decline significantly when mentality attributes are disciplined that were forgotten in previous research. Developing (FL) conciliations is a pronounced and ordinary reaction to the expanded commercial sector.

The factual evaluation demonstrates that (BSL) and (AFL) have meaningful influence on (SMP). Financiers which acquire higher gain on their withdrawal spending have much fiscal learning with compared to those who have less knowledge regarding finance. Persons having higher fiscal enlightenment, compile increased profit from retirement expenditures. (FL) offered autonomous

part. Extra pecuniary comprehend capitalists gather increased returns on capital than low financial knowledge financiers. Respondents to the (FL) examination, attained increased returns, hold bigger surplus and subsidized more from their incomes to retirements plans.

Investors, when are growingly needed to choose monetary sentences, decrease of (FL) can yield many counter impacts on financiers and accumulative advantages. Fiscal illiteracy produces unfair magnitudes plus, on other hand, higher level of unbalanced facts and figures among both financier and financial guider. Low Fiscal illiteracy at premature era has significant impact because of higher rate of involvement of youngsters to loans and financial mismanagements.

BFL is a type of monetary education which is equally significant for all investors, with different races, religions and gender. Basic level of literacy includes numerical know how, amalgamated profit, swelling prices, time, currency worth plus monetary delusion. Modern monetary literacy have stock emporium, bonds, interchangeable assets, fiscal wealth, many kinds of properties, surveillance cost and finally gambling profits mismanagements under its head. (AFL) is directly associated to higher risk tolerance, but on other side, normal level of (FL) is not correlated to risk attitude (RA). Empirical experiments on gender races with relevant to (RA) explains, women are more risk averse than to opposite gender ([Munir, Yue, Ijaz, Hussain, & Zaidi, 2024](#))

Financers having less-risk forbearance rank were subjected towards psychological financial partiality. Low risk-tolerant investors would classify the important fiscal instructions prior to choose any sudden act regarding their investment. Intermediate risk-choicer make dilatory financing decisiveness and they accept modern source of monetary data complicatedly. Investors under this head generally make financial decision established on historical false fiscal decisions ([Ferreira-Schenk & Dickason-Koekemoer, 2023](#)).

In this study we tried to explore the impact of financial literacy (Basic & Advance) & Gender preferences on decision making about (SMP) by taking Risk taking attitude in separate consideration. Although numerous studies are available on behavioral finance but as per best of my knowledge there isn't any reliable publication regarding Pakistan which has considered risk taking attitude as moderator too.

This study will contribute to highlight the importance of (FL) for (SMP) specifically with regards to gender gap which is in fact indispensable factor.

The continuing portion of this paper is prepared as follows: In 2nd part we gave brief literature review and developed conceptual frame work followed by discussion and conclusion in last part of study.

Literature Review & Conceptual Frame Work Development:

Literature on decision making about stock market participation and financial literacy suggest strong bonding between these variables. (FL) is one of the significant components which illustrate psychological modifications. A Strong connection lies between (FL) and attitude of financiers([Leckè, 2020](#)).

([Mitchell & Lusardi, 2022](#)) conducted a study in USA to explore the tie-in between financial literacy and investment performance and concluded that individuals equipped with better financial knowledge had 18% more stock as compare to less knowledgeable individuals and they were able to anticipate monthly 8 basis point more than financially illiterate counterparts further more having financial literacy made them to create more portfolio volatility. ([Rahim, Ismail, & Karmawan, 2022](#)) introduced (FL) as basic (BFL) or advanced (AFL).

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There was experience of fivefold raise in insolvencies in (US) during previous 30 years, many skilled professionals detected the above circumstances and gave remedy of increased (FL) and fiscal knowledge. (Hilgert et al. 2003, Greenspan 2005, Morton 2005, Lusardi and Mitchell 2007a, Mishkin 2008, U.S. Congress 2010, Cordray 2013), ([Netemeyer, Lynch Jr, Lichtenstein, & Dobolyi, 2024](#)).

Teenagers in (US) are laboriously relying on debts and they have lower level of (FL). Consumer Credit Panel (CCP) in 2012, 79% young people had consumer debt ([Urban, Schmeiser, Collins, & Brown, 2020](#)).

Keeping other factors constant, people who took (FL) examination raised their finance on investments by 66 points and their per month profit increased by 2.3 points ([Mitchell & Lusardi, 2022](#)).

Investors should know their expenditure attitude in relation of financial behavior for enabling them to choose best expenditure plan according to their (RA) ([Ferreira-Schenk & Dickason-Koekemoer, 2023](#)).

All previous studies have been conducted to explore role of (FL) in behavioral finance for the first time we are going to provide a framework which will consider risk attitude in account too.

Method:

The primary purpose of the study is to see the significance of BFL on SMP with regard to university students. Another purpose is to see the impact of AFL on SMP. For this goal, different university students were asked questions about the extent of AFL and BFL. The third goal of this study is to see the impact of AFL on SMP with moderating role of RA. Similarly taking RA in consideration role of BFL on SMP is another objective of the study. Fifth purpose of study is to check the gender gap in SMP and ultimately observing the SMP with gender gap taking RA in deliberation. 6 main questions are arising: What is the significance of (BSL) on (SMP)? What is the role of (AFL) on (SMP)? What is the role of gender gap on (SMP)? What is the role of (BFL) on (SMP) taking risk attitude in account? What is the role of (AFL) on (SMP) taking risk attitude in solicitude? What is the role of gender gap on stock market participation taking risk attitude in account?

Research Design:

This study investigated SMP of university students having a survey with four modules: BFL, AFL, GP and RA. Several researchers have carried extensive types of financial literacy surveys for vast range of objectives. “Lusardi and Mitchell”, who mainly studied monetary knowledge, formulated a survey comprising of 3 questions for the American Health and Retirement Study (HRS) in 2004, which become widely popular. Many other FL surveys have been conducted by the World Bank CPFL Program, OECD, and DNB. Two new factors were formulated for the DNB survey by “Lusardi” which have been utilized for several years in research e.g., ([Gallego-Losada, Montero-Navarro, Rodríguez-Sánchez, & González-Torres, 2022](#)).

Different Demographic factors were collected and analyzed, for instance education, age, gender. In the first section, “Lusardi’s (2008) financial literacy survey” containing BFL questions was used. In the second section, “Lusardi’s (2008) financial literacy survey” containing AFL questions was taken to ask the respondents how much they know about AFL just like in first module, responses regarding BFL were collected. In third module, defendants were analyzed about RA (for example: “Females invests less₂ in stock market than males because of risk aversion” using a 5-point Likert Scale: Strongly Agree, Agree, Neutral, Disagree, Strongly

Disagree). The third section, RA measurement used was derived by researcher and few questions were adapted.

Sampling:

Questionnaires were specifically distributed to business and commerce students doing programs like MBA, BBA, B.Com (hons), M.Phil and P.hD. A sample of 300 students was formulated. A total of 200 surveys were returned by respondents (return rate: 66.66%). the under-graduated respondents were focused for BFL and post-graduate students were analyzed about AFL. Whereas RA module was for both higher education plus graduate students. This study was mainly for Pakistan and different public sector and as well as private sector universities from Lahore were chosen for this purpose.

Model Development:

Explanatory Variables:

Our independent variables include Gender and financial literacy. Financial literacy is divided into two heads basic & advance financial literacy. Both type of financial literacy will measured through different questionnaires given in appendix. And those questionnaires were adopted from([Rahim et al., 2022](#)).

Moderator Variable:

Our another variable is risk taking attitude it will be measured by asking the participants to rate themselves how much risk taking they are on a scale of 1 to 5, where 1= Highly risk takers, 3= totally risk averse.

Explained Variable:

Our explained variable is Stock Market Participation which will be measured through a simple question from participants, Have they ever participated/ want to participate in future in Stock Market ? (Yes/No).

Problem Formulation:

On the basis of above discussion problem formulation can be developed as follows:

- I. What is the significance of (BSL) on (SMP)?
- II. What is the role of (AFL) on (SMP)?
- III. What is the role of gender gap on (SMP)?
- IV. What is the role of risk attitude on (SMP)?

Hypothesis Development:

Keeping in mind the earlier developed problems statements hypothesis are developed as below:

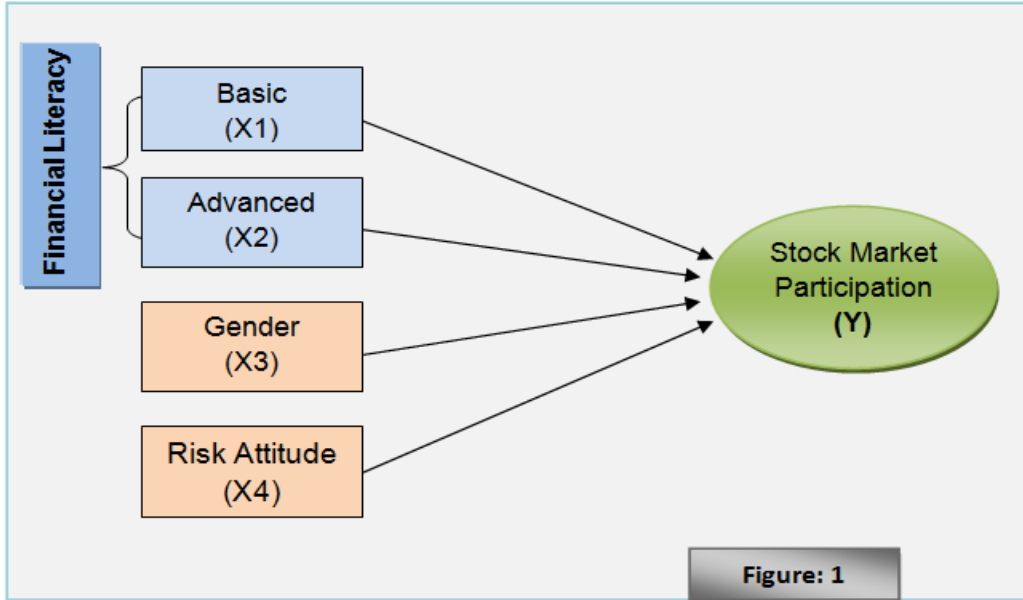
H1: Basic financial literacy significantly impacts the stock market participation.

H2: Advanced financial literacy significantly impacts the stock market participation.

H3: Gender gap significantly impacts the stock market participation.

H4: Risk attitude significantly impacts the stock market participation.

Conceptual Framework:



Econometrics Model:

In above given framework there are 3 independent variables which include Gender, Basic and Advance financial literacy and dependent variable used is Stock Market Participation. Variable risk attitude is also the part of econometrics model.

So Regression equation can be derived as follows:

$$Y = a + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Interpretation:

Y = Market Participation

a = Constanta

X1 = Basic Financial Literacy

X2 = Advance Financial Literacy

X3 = Gender

X4 = Risk Attitude

ε = Error term

Data analysis:

While doing data analysis, researcher considered following tests:

- Reliability test (IBM SPSS)
- Descriptive analysis (STATA)
- Correlation analysis (STATA)
- Logistic regression (STATA)

Reliability test:

Researcher checked the reliability of questions of each variable through IBM SPSS statistics 25 version. Each variable had reliable determinants after analyzing the results. Reliability is analyzed through cronbach's alpha value. Benchmark value for cronbach's alpha is .70 so; interrogations of each variable must be above .70. According to statistical results cronbach's alpha value for BFL is .95 which is above of .70. As for AFL value is .98 (.98>.70) and for RA .86 is value which is acceptable.

Descriptive analysis:

This analysis is usually done to see the overall view of data in compact form plus this test has nothing to do with acceptance or rejection of hypotheses (heikal et al). Mean, standard deviation, minimum and maximum are the computable factors analyzed in this evaluation. In following examined **table (1)** minimum and maximum amounts observed about each variable is shown. Average variation of each variable around its mean is also shown by standard deviation.

Table: 1

Variable	Obs	Mean	Std. Dev.	Min	Max
Genderid	50	1.48	.504672	1	2
AFLavg	50	.4282	.386178	.09	1
BFLavg	50	.704	.3664279	0	1
Risk	50	2.3402	.5921269	1.67	4
SMP	50	.56	.5014265	0	1

Correlation

analysis:

Table: 2

(obs=50)					
	SMP	Risk	BFLavg	AFLavg	genderid
SMP	1.0000				
Risk	0.0092	1.0000			
BFLavg	0.5207	-0.1412	1.0000		
AFLavg	-0.0495	-0.0074	-0.1071	1.0000	
genderid	-0.3581	-0.0317	0.0556	-0.0122	1.0000

According to **Table: 2** which is showing the correlation results of all variables risk attitude is positively linked with SMP with a magnitude of 0.0092. BFL is also positively engaged with SMP with immensity of 0.5207, It means a change of 1 unit in BFL will indulge a change of 0.52 in SMP. AFL is negatively interlinked with SMP with enormity of -0.0495. Which means an increase in AFL will cause inverse impact on SMP. Genders preferences are also inversely related with SMP, which is depicting females, are less participative in stock market as compare to males.

Logistic regression analysis:

Table: 3

Logistic regression		Number of obs		=	50	
		LR chi2(4)		=	25.14	
		Prob > chi2		=	0.0000	
Log likelihood = -21.726477		Pseudo R2		=	0.3665	
SMP	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
Risk	.4737178	.6430932	0.74	0.461	-.7867218	1.734157
BFLavg	4.31063	1.228097	3.51	0.000	1.903604	6.717656
AFLavg	.0188241	1.008427	0.02	0.985	-1.957657	1.995305
Genderid	-2.463235	.9061053	-2.72	0.007	-4.239169	-.6873012
_cons	-.0106941	2.10436	-0.01	0.996	-4.135163	4.113775

Above given table statistical results are outcomes of logistic regression, we performed to test our hypotheses. Value Pseudo R square is 0.36 and it means total explanatory power of all independent variables in our model towards our dependent variable is 36%. And this model is best fit & indispensable at 0.00 levels of significance.

In **Table: 3** it can be seen BFL is positively amalgamated with SMP and coefficient slope is 4.31063 which mean 1 unit increase in BFL will create an addition of 4.3103 points in SMP ratio. So our first hypothesis suggesting that Basic financial literacy significantly impacts the SMP is accepted and this result is remarkable at 0.00 levels of significance. Our second hypothesis stating

that AFL significantly impacts the SMP is rejected because in above extracted results AFL's influence upon SMP is positive but insignificant. Gender preferences is negatively correlated with SMP from above shown it can be concluded females tend to participate in stock market less likely as compare to male. So third hypothesis affirming that gender preferences significantly impacts the SMP holds true and this outcome is indispensable with 0.00 levels of significance. Our fourth and last hypothesis asserting that risk attitude is positively correlated with SMP is rejected although coefficient slope is positive but this result is insignificant.

1) Discussion and conclusion:

In this study we tried to explore the impact of financial literacy (Basic & Advance) & Gender preferences on decision making about (SMP) by taking Risk taking attitude in separate examination. Although numerous studies are available on behavioral finance but as per best of my knowledge there isn't any reliable publication regarding Pakistan which has considered risk taking attitude as independent variable too. We explained how (BSL) and (AFL) affects (SMP) taking the (RA) in account. We also applied (BSL) plus (AFL) effects on gender, according to results female have less risk taking attitude, on other hand, also have less (BSL) and up to some extend have no (AFL). Eventually, women have less part in (SMP) than men.

In contrast, men are more risk taker and they know much knowledge regarding (BSL) and to some level they know more about (AFL) than opposite gender. So their participation in (SM) is much higher than women. (BSL) have different impact on (SMP) as compared to (AFL). This study is conducted to different levels of age groups, for instance, on youngsters who have less (FL) and are dependent on loans. This study also have relation with aged or retired people, who have positive (FL) so they plan more professionally for their retirement ideas than the groups of people who have less or negative (FL).

Investors also have psychological impacts in their minds. This implies if people have consistent know how about (FL) keeping (BSL) (AFL) on the record, then they may take opposite decisions regarding investments because of (RA). So we conclude that (RA) is moderating factor.

Financers having less-risk forbearance rank were subjected towards psychological financial partiality. Low risk-tolerant investors would classify the important fiscal instructions prior to choose any sudden act regarding their investment. Intermediate risk-choicer make dilatory financing decisiveness and they accept modern source of monetary data complicatedly. Investors under this head generally make financial decision established on historical false fiscal decisions.

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Financial Literacy, Risk Appetite and Stock Market Investments; Intellectual investment or Actual Investment

Sehrish Fraz

School of Business and Management
Information Technology University of the Punjab, Pakistan

Dr. Muhammad Adnan Sial

UE Business School,
Division of Management and Administrative Science,
University of Education, Lahore

Abstract

This study investigates the relationship between financial literacy and risk appetite on the stock market investments. This study was based on three variables: Financial Literacy as an independent variable, Risk Appetite as a moderating variable and Stock Investments as a dependent variable. The studied population consisted of persons with financial knowledge who had been or ever invested in the stock market. This research was limited to a small number of financially literate people, so the sample size was 150. A convenient sampling technique was used to collect the primary data through Google Forms. Cross-sectional and field design was implied during the research. The primary data of 100 respondents were collected through a questionnaire developed based on scales adopted from past studies. The validity and reliability of the data was ensured through Cronbach's alpha. The hypotheses were tested through PROCESS for SPSS and SAS 2013-2016 Andrew F. Hayes and the Guilford Press macro installed and run on SPSS version 27.

Introduction

To make investment decision in now a day to support financially, investment choices are really important. People abilities to efficiently handle their funds are introduced as financial literacy. While their risk appetite defines the person willingness to accept the level of risk to make financial investments. The purpose of the study is to understand the relationship between financial literacy and risk appetite, risk appetite and stock investment, and the final effect of financial literacy on stock investment, so to determine connections between all the variables.

Broadly this study is more about behavioral finance. Specifically, this study focuses on financial literacy, risk appetite and stock investments, and the relationship between these variables is to make actual investments (doing investments after keeping all factors in mind) or intellectual investments (carefully analyzing risk and then making investments).

The study is based on the following research question:

How stock market investments are being influenced through financial literacy and risk appetite, considering the effect of actual and intellectual investment behaviors?

Significance of the Study

The study is particularly significant as it develops an understanding of how individuals' financial behaviours, like financial literacy and risk appetite, affect stock market investments. Past literature review gaps, such as the impact of financial behaviour on investment decisions, are also being addressed. The relevance of these factors helps in better decision-making.

Motivation of the Study

It is necessary to understand why people, despite the modern potential for high returns in investment options like stock markets, still choose to make traditional low-return paying investments like bank deposits and government bonds. This study will help to determine whether there is any lack of financial literacy that prevents people from making more risky investments.

Literature Review

Behavioral finance has an impact on investment decisions, and risk propensity also affected the relationship between behavioral finance and investment decisions (Islam, Bhat, Lone, Darzi & Malik, 2024). According to Lone and Bhat (2022), people invest more in traditional instruments like in bank deposits and also in less risky assets like bonds because of known risk and with less returns. That is because people had less accessibility in investment options and opportunities in common stocks and in derivative instruments, they require more in detail knowledge as to invest in more risky assets like common stock (Islam, Bhat, Lone, Darzi & Malik, 2024).

Financial literacy

Behavioral finance in most of the time challenged the principle behind efficient theory that information is immediately affected in markets but most of the time it fails due to the fact that markets are not efficient enough to reflect information immediately (Kumar & Goyal, 2015). And one other reason behind that why markets are enough efficient according to market efficiency theory is that in developing countries most people are not involved in trading common stocks on stock exchanges. Ricciardi and Simon (2000), defines behavioral finance as: “While conventional academic finance emphasizes theories such as modern portfolio theory and the efficient market hypothesis, the emerging field of behavioral finance investigates the psychological and sociological issues that impact the decision-making process of individuals, groups, and organizations”. Definition of Financial literacy: Hilgert, Hogarth and Beverley (2003), page # 309-312, “The understanding ordinary investors have of market principles, instruments, organizations and regulations”.

Financial knowledge is much related to financial literacy, financial literacy involved to take decisions using multileveled skills and manage information based on risk involvement (Mason & Wilson, 2000). Individuals are not just money creating machines, they have several cognitive traits associated with them that impact their investment choices (Kengatharan & Kengatharan, 2014). It is important to mention here that previous work done on efficient market theory not to dismiss that, but every individual contain a different behavior from others and could be make more realistic by considering individual behavioral aspects while making investment decisions (Mittal, 2019). According to Mittal (2019), there are two main reasons existed to the irrational behaviors of investors, one reason is that humans are going through different emotional level all the times and second reason is most of investors are influenced by different news reports at the time of decision making. The extant literature is missing some key points that indicate the effect of behavioral biases on investment decisions (Daniel, Hirshleifer & Subrahmanyam, 1998).

Risk Appetite

Definition of Risk appetite: “Risk propensity is actually referring of risk attitude of potential investors in terms of investment choices that based on level of risk taking” (Sitkin & Pablo, 1992, page # 9-13). Risk appetite as an individual characteristic can determine investment decision of potential investor (Iqbal, 2013). Through risk propensity or risk appetite behavior financial planning process can be developed and implemented (Carr, 2014). According to Barnewall (1987), said that investors with low-risk appetite leads the investors towards passive investment behavior in which investors buy and sell investments with minimum turnover and those investors having high risk appetite leads towards active investments in which investors buy and sell investments on short term period-based performance and try to beat average market returns. According to Malmendier and Nagel (2011), investors having low risk appetite participate in

stocks investments with less in number. Risk propensity is based on several behavioral biases that varied in each investor, including confidence bias, herding bias (Islam, Bhat, Lone, Darzi & Malik 2024). Herding is a bias that follows what investors are making investment decision quite irrespective of their risk propensity (Waweru et al., 2008).

According to Islam, Bhat, Lone, Darzi and Malik (2024), risk propensity is of great importance in investment decision as risk averse people would more likely to invest in traditional instruments rather than on stock exchanges with more risk and with more return, they rather made investments in known risk with less return as local investors or in finance language layman had not much financial knowledge to make investments on stock exchanges. They will rather invest in mutual funds through finance managers at companies and would take their profits or earning back. Vogenberg and Cutts (2009), said that in period of Global financial crisis in 2008 people decreased their spendings and wanted to invest more but in more reliable and with less risk to get known returns and same patterns were found during the time of Covid-19 pandemic (Islam, Bhat, Lone, Darzi & Malik, 2024). Gerrans, Faff and Harnett (2015), proved the evidence of why risk propensity increases or decrease patterns are not much fluctuated in global crises and during covid-19 pandemic as well but later on came to fall.

Stock Investments:

According to Islam, Bhat, Lone, Darzi and Malik (2024), people move more towards risk averse behavior in the time of crises as global financial crisis (2008) and in pandemic time (2019) as people lose confidence. According to Islam, Bhat, Lone, Darzi and Malik (2024), there are many underlying theories that associate behavioral finance with behavior biases to effect investment decisions. Kahneman and Treversky (1979a) said that people values losses more than gains and they remember more the losses that occurred to them more times they gained profits.

Stock investments can be defined as which type of investments investor wants to choose on stock market. Limited studies existing that incorporate stock portfolio optimization issues faced by investors that when to short sell the purchased securities and when to retain them even their stock prices are declining (Savaei, Alinezhad & Eghtesafrad, 2024). The critical point for behavioral finance is not how the risk is measured, but how it is perceived, how it is mitigated, and how to be eager the aversion (Aren & Hamamci, 2019). According to Aren and Hamamci (2019), when people are in hope of making money, they usually take risk and when people are in fear of losing money, they usually avoid risk, and that is based on people's emotions at a certain point of time. Neoclassical finance says that emotions are opposite to rational decision making and emotions generally ignored according to neoclassical finance and emotions must combined with knowledge while making decisions (Aren & Hamamci, 2019). Effect of emotions is not just emotion in financial markets but these are assets said by Aren and Hamamci (2019).

Sadness an emotion that overestimate the feeling of being loss and underestimate the feeling of positive results (Dijk, 2017). In those assets that investors felt loss will not invest again due to sadness emotion with being feeling of loss again (Aren & Hamamci, 2019). Aren and Hamamci (2019), said that those investors who had risk taking attitude invest more in stock markets and derivatives and those with less risk-taking behavior invest more in preferred bonds and bank deposits. Financial literacy is considered as an important factor while investing as those who have financial literacy leads to take high risk and those who are not financially literate take less risk (Aren & Hamamci, 2019). Education level might not impact the financial literacy, as many educated people existed but did not mean to have financial knowledge (Gibson et al, 2013).

Zaimovic et al. (2023) described the significance of financial literacy for people's well-being. Outputs of financial literacy includes how to diversify risk and returns on investment. McCarty (2000) said that risk taking behavior of individuals varies with character and according to situations. According to Weber, Blais and Betz (2002), risk avoidance or risk taking is neither based on individual's preferences but its all based on circumstances.

Guiso and Jappelli (2008), stated that those persons with low financial literacy find any investments that are unfamiliar to them, they consider it riskier and those persons with high financial literacy are already having familiarity with investments consider them less risky. It is important to mention here that financial literacy and level of education are two entirely different things.

Guiso and Jappelli (2008), also mentioned that people with low financial literacy having not sufficient financial knowledge not optimized their portfolios with diversification. Diversification is actually investing in different types of assets on stock exchange, for example one person is investing in stocks should manage his portfolio along with investing in gold or real estate stocks just to get diversification benefits.

Hypothesis 1: Financial literacy positively influences individuals' risk appetite.

Risk Appetite and Stock Investments

Studies also mentioned that those persons having low risk appetite more invest in dividends paying stocks like in preferred stocks than common stocks. The reason behind that is on public limited companies those that are registered on stock exchange consider preferred stocks as 'quasai debt' and its payments in dividends are obligatory to stocks investors while investors in common stocks are more risk takers as any loss in business leads to lose their dividends, that's why common equity stocks are considered riskier.

A variable that can relate risk appetite with investment choices is demographics which constitutes gender, level of education, income, age, marital status. Arano, Parker and Terry (2010), mentioned that based on previous studies they evaluated that men are more risk taking than women but except the fact that women prefer more stocks of pension than men. Dwyer, Gilkeson and List (2002) and Adhikari and O'leary (2011), stated that men might have greater financial literacy and knowledge of markets that leads them to take more risk. Nekby, Thoursie and Vahtrik (2007), and Crosan and Gneezy (2009), said that despite all the evidences based on previous studies could not confirmed that there is no specific relationship between gender, risk taking behavior and investment decisions.

Hypothesis 2: Individuals with a higher risk appetite are more likely to invest actively in stock markets.

Financial literacy and Stock Investments

According to Aren and Canikli (2019), people with getting older became more conservative and less adventurous, preferred riskless, low and fixed returns for throughout their life span. Dulebohn (2002), also supported this statement that young individuals take more risk and are more adventurous than older people. Clark and Strauss (2008) and Gibson, Michayluk and Venter (2013), stated that there is no as such relationship existed between risk taking behavior and marital status. Gibson, Michayluk and Venter (2013), also discussed that no significant relationship existed between risk taking and level of education.

According to Carducci and Wong (1998) and Wong and Carducci (1991), on basis of personality traits, there are two types of investors existed, one type A and others are type B, Type A persons have more tendency of risk seeking behavior. Mudrack (1999), suggested that type A people are living with pressure of time, moving fast, somehow are greedy and taking more risk. Hirshleifer

(2001), stated that people mostly overestimate the chances of success and underestimate the chances of loss.

According to Aren and Canikli (2019), financial literacy is considered such a concern that had been in discussion from many years, both public and private sectors had tried to raise awareness among people on financial issues while researchers were making attempts to determine the relationships between financial literacy and investment decisions. Lusardi and Mitchell (2008), stated that individuals having low financial literacy made less stock investments and invested more in bank deposits that is considered a safer way of investment.

Atkinson and Messy (2012), stated that a financial literate is who contains some basic knowledge of finance concepts. Astiti, Warmana and Hidayah (2019), said that financial knowledge is the complete mastery in various concepts in finance. Ida and Dwinta (2010), mentioned there could be several ways to get financial knowledge which constitute not only formal education but also learning from elders like parents, teachers and from any training programs attended during any period of life.

According to Lusardi and Mitchell (2007) and Chen and Volpe (1998), if a person has financial knowledge it will lead to do financial forethought for meet upcoming financing needs. A person's state of mind is reflected through his attitude, and on his opinion that what he thinks on the basis of surroundings' (Pankow, 2012).

Ida and Dwinta (2010), studied that the more an individual has responsibility of managing financials the greater financial behaviour he has. Astiti, Warmana and Hidayah (2019), mentioned in their research that the more a person has good financial behaviour have controlled on spending, not wasting money and making budgets, clearing utilities on time and also wisely invest to have enough money in future to sponsored his expenses, and those who are mostly relying on credits they lose their financial wellness with time.

According to Pertiwi, Wardani, and Septentia (2020), financial knowledge is a very basic need to solve real life finance problems. Pertiwi, Wardani and Septentia (2020), also mentioned while dealing with investments relevant experience is required in financial management to manage portfolios and everyone experience is different from others in a certain field. Such experience can be obtained from a learning process from either loss or profit from previous investments, for example person have any past experience in stocks investment, or investing in gold or in mutual funds, this experience might be obtained by investor's himself or from getting piece of advice from family members and friends who had experience in recent past (Pertiwi, Wardani & Septentia 2020).

Pertiwi, Wardani and Septentia (2020), also stated in their research that any person who had much experience in investment field, they gave an example that if such person is doing work as a broker in a brokerage firm (broker is a person who assists buying and selling of stocks in a stock exchange and gave advice to investors) might have greatest experience from all other new comers in that field and have more financial knowledge as they already dealt with many of the investor's concerns, many new investors in market who at initially suffered with more losses than profits, might leave the market.

Most of the people make investments just to get maximum return in the future (Pertiwi, Wardani & Septentia, 2020), a happy investment will guide investor in the future as well to make such investments again.

Grable and Roszkowski (2007) studied the relationship between happiness and money but get a weak correlation showing that there are other measures are also existed to check the happiness. While financial satisfaction could be defined as level of satisfaction that is generated from

income, how he is managing his emergency situations like immediate health problems or management of debt (Hira & Mugenda, 2000).

The more financial experience investors had, he will make investment choice accordingly because according to personal thoughts how much smoothly will go the investment (Pertiwi, Wardani & Septentia, 2020). In this sense financial knowledge had a very important affect on the choice of investment (Pertiwi, Wardani & Septentia, 2020). Much care also involved as financial knowledge increases decision making will also be more difficult and satisfied investors would make their decisions even more wisely (Pertiwi, Wardani & Septentia, 2020).

Everyone should make investments as the purpose of making investment is to gain maximum profit in future and improve well-being of individuals (Tandelilin, 2010). Income is considered as the most important factor in deciding to make investment. Rasyid et al. (2018), said despite of understood concept of that financial knowledge is great tool to make investment decisions, irrespective of this fact financial knowledge rates are still low in most countries. According to Rasyid et al. (2018), those who are financially below average not invest more and those who are earning more invest more. Thus, it is income level which decides how much and where to invest (Rasyid et al. 2018). Investors tends more to invest in those listed companies with highly positive socially linked, so that they consider their investments are safe (Mubaraq, Anshori & Trihatmoko, 2021).

According to Mubaraq, Anshori and Trihatmoko (2021), there are two type of investors, one type are rational investors and others are irrational investors. Those who are rational make financial decisions on the basis of available information and their financial knowledge and on risk calculation (Mubaraq, Anshori & Trihatmoko, 2021). Those investors who are irrational make financial decisions on the basis of other factors like psychological and demographics (Mubaraq, Anshori & Trihatmoko, 2021).

Hypothesis 3: Higher financial literacy positively impacts individuals' likelihood of investing in stock market.

Methodology

The methodology involves in this study to measure the relationships between variables is targeting to calculate data from those people who have financial knowledge like they are students of financial institutions, teaching finance in colleges or universities and those who are investing in in the stock market of Pakistan (Pakistan Stock Exchange PSX).

Past studies in the areas of financial literacy, risk propensity and investment decisions are being used to develop the items used to measure related variables. Financial literacy scale was adopted by Rooij, Lusardi and Alessie (2011), risk appetite and stock investments were measured through using scales of Aydemir and Aren (2017), Aren and Canikli (2018).

Population

This research has particularly been narrowed down to include those who have financial knowledge and any type of investment experience as respondents. Population results may be varied due to different levels of financial literacy and risk appetite. Due to time bound to 1 semester is it not possible to calculate data from all population. So, the sample size is finalized to 150, as a smaller number of people in underdeveloped countries like Pakistan are involved in stock market investments.

Sampling Strategy and Size

Due to time bound it was not possible to do ¹⁸⁴probability sampling. Convenient Sampling was chosen to collect data. One of my instructors also make stock market investments, data was

collected from instructors, fellows, and from those that were investing on stock market (for example friends of instructors). Sample data of 101 is collected through google forms and through formulae of Green (1991).

Inclusion-Exclusive Criteria

Individuals involved in stock market investments and have financial knowledge, even those not investing in stock markets, are included. Those people with no link with stock market investments and do not have financial knowledge, like in the case of students, haven't studied finance were excluded.

Unit of Analysis

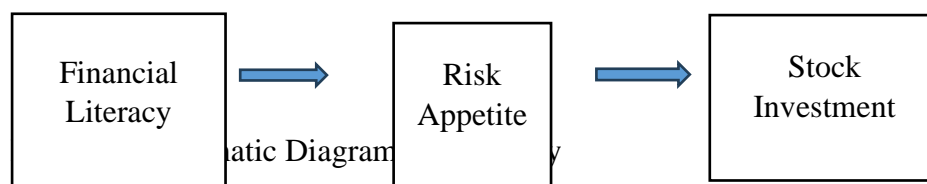
Unit of analysis is individual, based on their behavior of having financially literate and on their risk seeking attitudes during their financial decisions.

Instrumentation

For primary data collection, questionnaire was divided into four sections for quantitative data. Section 1 is about demographics, discussing about gender, marital status, age, obtained qualification and Stock market investment experience. Section 2 describes Financial literacy through 9 items scale. Section 3 describes Risk Appetite of individuals through 6 items scale. Section 4 describes Stock Investments through 5 items scale.

Research Design

This research is an exploratory study to explore research problems and hypotheses for future usage. This is a cross-sectional study due to limited time. This study is being conducted in an actual environment.



Data Analysis

Table 1

Demography

		Number	%	Total
Gender	Male	51	50.5%	
	Female	50	49.5%	
Total			101	100
Marital Status	Unmarried	44	43.6%	
	Married	57	56.4%	
	Divorced	0	0%	
	Widowed	0	0%	

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Obtained Qual	Matric	1	1.0%
	Intermediate	30	29.7%
	Bachelors	45	44.6%
	Masters	25	24.8%
Age	21-25	43	42.6%
	26-30	29	28.7%
	31-35	24	23.8%
	36 and above	5	5.0%
Stock Experience	1-3 years	33	32.7%
	4-6 years	23	22.8%
	7-9 years	14	13.9%
	10 and above	8	7.9%
	None	23	22.8%

Referring Table 1, majority of the respondents were Male (N=51, 50.5%). Respondents from age group 36 and above were almost absent with N = 5 (5 %). Whereas of the respondents were between 18 and 25 years of age, i.e. N=43 (42.6%). Table 1 also indicates that majority of the respondents were married (N= 57, 56.4%). The table 1 indicates that based on demographics factor the sample extracted was the true representative of the studied population.

Table 2

Reliability Analysis:

Variable	Cronbach's Alpha	Cronbach's Alpha based on Standardized Items	No. of Items
Financial Literacy	.704	.702	9
Risk Appetite	.594	.583	6
Stock Investments	.973	.974	5

Financial Literacy (FL) reliability analysis:

Referring Table 2 the data is reliable for each of the item at Cronbach's alpha > .7 and this is according to the understanding given by Nunnally (1978). It is pertinent to mention that 1 item

(FL4) was deleted to improve the reliability of the data. Thus, it is concluded that data is reliable for further analysis.

Risk Appetite (RA) reliability analysis:

Referring Table 2 the data is reliable for each of the item at Cronbach's alpha > .5 and this is according to the understanding given by Nunnally (1978). It is pertinent to mention that one of the items (RA2) was deleted to improve the reliability of the data. Thus, it is concluded that data is reliable for further analysis.

Stock Investments (SI) reliability analysis:

Referring Table 2 the data is reliable for each of the item at Cronbach's alpha > .7 and this is according to the understanding given by Nunnally (1978). It is pertinent to mention that none of the items was deleted to improve the reliability of the data. Thus, it is concluded that data is reliable for further analysis.

Regression Analysis and Hypothesis Testing Results:

Run MATRIX procedure:

***** PROCESS Procedure for SPSS Version 4.2 *****

Written by Andrew F. Hayes, Ph.D. www.afhayes.com

Documentation available in Hayes (2022). www.guilford.com/p/hayes3

Model: 4

Y: SI

X: FL

M: RA

Sample

Size: 101

OUTCOME VARIABLE:

RA

Model Summary

R	R-sq	MSE	F	df1	df2	p
.2030	.0412	.2294	4.2539	1.0000	99.0000	.0418

Model

	Coeff	se	t	p	LLCI	ULCI
constant	2.4861	.2208	11.2603	.0000 ¹⁸⁷	2.0480	2.9241
FL	.2125	.1030	2.0625	.0418	.0081	.4169

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Standardized coefficients

Coeff

FL .2030

Covariance matrix of regression parameter estimates:

	constant	FL
constant	.0487	-.0222
FL	-.0222	.0106

OUTCOME VARIABLE:

SI

Model Summary

R	R-sq	MSE	F	df1	df2	p
.1669	.0278	.4996	1.4037	2.0000	98.0000	.2506

Model

	Coeff	se	t	p	LLCI	ULCI
constant	4.0378	.4921	8.2052	.0000	3.0612	5.0144
FL	-.2155	.1553	-1.3878	.1683	-.5237	.0927
RA	.1781	.1483	1.2009	.2327	-.1162	.4725

Standardized coefficients

Coeff

FL -.1412

RA .1222

Covariance matrix of regression parameter estimates:

	constant	FL	RA
constant	.2422	-.0368	-.0547
FL	-.0368	.0241	-.0047
RA	-.0547	-.0047	.0220

Test(s) of X by M interaction:

F	df1	df2	p
.0733	1.0000	97.0000	.7871

***** TOTAL EFFECT MODEL *****

OUTCOME VARIABLE:

SI

Model Summary

R	R-sq	MSE	F	df1	df2	p
.1164	.0135	.5018	1.3591	1.0000	99.0000	.2465

Model

	Coeff	se	t	p	LLCI	ULCI
constant	4.4807	.3266	13.7201	.0000	3.8327	5.1287
FL	-.1777	.1524	-1.1658	.2465	-.4801	.1247

Standardized coefficients

Coeff

FL -.1164

Covariance matrix of regression parameter estimates:

	constant	FL
constant	.1067	-.0486
FL	-.0486	.0232

***** TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y *****

Total effect of X on Y

Effect	se	t	p	LLCI	ULCI	c_cs
-.1777	.1524	-1.1658	.2465	-.4801	.1247	-.1164

Direct effect of X on Y

Effect	se	t	p	LLCI	ULCI	c'_cs
-.2155	.1553	-1.3878	.1683	-.5237	.0927	-.1412

Indirect effect(s) of X on Y:

Effect	BootSE	BootLLCI	BootULCI	
RA	.0379	.0399	-.0319	.1260

Completely standardized indirect effect(s) of X on Y:

Effect	BootSE	BootLLCI	BootULCI	
RA	.0248	.0251	-.0204	.0804

***** ANALYSIS NOTES AND ERRORS *****

Level of confidence for all confidence intervals in output:

95.0000

Number of bootstrap samples for percentile bootstrap confidence intervals:

5000

----- END MATRIX -----

Hypotheses Testing

1. First Model (FL → RA)

This model examines whether FL predicts the mediator RA: $R^2 = 0.0412$: FL explains 4.12% of the variance in RA. $F(1, 99) = 4.25$, $p = 0.0418$: The model is statistically significant. Unstandardized coefficient (b) = 0.2125, $p = 0.0418$: FL has a significant positive effect on RA. Standardized coefficient (β) = 0.2030: The effect size is small to moderate.

2. Second Model (FL, RA → SI)

This model examines whether FL and RA jointly predict the outcome SI: $R^2 = 0.0278$: FL and RA together explain 2.78% of the variance in SI. $F(2, 98) = 1.40$, $p = 0.2506$: The overall model is not statistically significant. FL ($b = -0.2155$, $p = 0.1683$): FL does not significantly predict SI. RA ($b = 0.1781$, $p = 0.2327$): RA does not significantly predict SI. Interaction test ($F = 0.0733$, $p = 0.7871$): No significant interaction between FL and RA.

3. Total Effect of FL on SI

This tests the direct effect of FL on SI without accounting for RA: $R^2 = 0.0135$: FL explains only 1.35% of the variance in SI. FL ($b = -0.1777$, $p = 0.2465$): The total effect of FL on SI is not significant.

4. Indirect Effect (Mediation via RA)

This tests whether RA mediates the relationship between FL and SI: Indirect effect ($b = 0.0379$, BootCI [-0.0319, 0.1260]): The confidence interval includes zero, indicating the indirect effect is not statistically significant. Standardized indirect effect ($\beta = 0.0248$, BootCI [-0.0204, 0.0804]): Also, not significant.

Practical Implications of the Study

The hypothesis results show that FL weakly but significantly affects RA, meaning FL is capable of staying in the outcomes of RA in real-world applications to some extent. By FL and RA into the be slight direct or indirect effect on SI, which implies FL is probably not a predictor of SI in this specific context. Looking for practical implication, If improvement in SI is targeted, targeting through only FL might be insufficient, there must be need for other variables too.

Conclusion

The study says that FL shows a small but still relevant influence on RA, but both of them are neither of the SI factors. RA being a mediator was not identified. Further research can be carried out examining these links using larger samples, various measures, or other variables that contribute to the veracity of these results and their possible significance.

Limitations and Recommendations of the Study

The study reported a small number of respondents ($N=101$), which may make it difficult to draw valid inferences from the study and thus reduces statistical power. It could be argued that only weak links were noted, so the practical significance of the study could be debatable. This study was also time bound so in case of plenty of time available, this research could be conducted again with the changings made in the variables and their measurement. The inference that no significant effects of mediation were detected may reflect⁹⁹ lack of coordination between the conceptual model and the external data. It is difficult to link that is cross-sectional to causality.

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Evaluating Ups and Downs of National Savings of Pakistan by Transform Analysis

Tehmina Fiaz Qazi

Hailey College of Banking and Finance
University of the Punjab, Lahore, Pakistan

Abdul Aziz Khan Niazi

Department of Management Sciences, New Campus,
University of Engineering and Technology, Lahore, Pakistan

Suleman Sami Qazi (Corresponding Author)

Department of Electrical Engineering,
University of Engineering and Technology, Lahore, Pakistan

Abstract

The aim of the study is to evaluate ups and downs of national savings of Pakistan. The design of the research study embraces to review of relevant current research literature, data assemblage and analyzing it. The study follows positivist research philosophy, and deductive research approach. The data of Pakistan's national saving schemes i.e. outstanding amount, account balance, certificates (outstanding amount), national savings bonds, and prize bonds for the period of last thirty years is obtained from central bank of Pakistan. The analysis is performed on MatLab software using the wavelet tool box to perform wavelet transform analysis. Wavelet transform is a technique of signal analysis that is capable of capturing the movements both in time domain and frequency domain. The findings of the study show a lot of new insights and have profound practical and theoretical implications because the study is designed on real time authentic data. It is useful for regulators, general public and research community.

Keywords: Ups and Downs of National Savings in Pakistan, Wavelet Transform, Wavelet Analysis, Pakistan's National Savings

Introduction

National savings are considered a significant factor in the economic growth & development of the country. National savings are the measure of the economy's financial health. They are comprised of individuals, businesses, and government savings. Di Gennaro, Ferrini, & Turner, (2025) bolstered that both dashboard and deontological genuine saving are linked with poverty. Jabbari, Roll, & Brugger, (2024) reached to the conclusion that visual reminders significantly increased the amount and frequency of contributions. Lee, et al. (2025) proved that among younger-generation, subjective financial skills act as protective factors and enhance relationship between objective financial-knowledge and participation in stock-market. But in older-generations, finance-related knowledge and skills, utilize traditional-retirement. Hence, subjective financial skills are significant in enhancing engagement in complex savings options. There is a gap in literature to this extent in the context of Pakistan and it is imperative to investigate the phenomenon. The objective of the current research study is to examine ups and downs of national savings of Pakistan. The study considered a multitude of methods for achieving the objectives of the study viz Co-integration, COPRAS-G, FMEA-Model, Granger Causality, IRP, ISM, MABAC, MAUT, Regression Analysis, Wavelet analysis, TACTIC, VER, etc. and finally used wavelet analysis as the research methodology like that in Qazi, et al., 2023; Tariq, et al., 2023; Qazi, Niazi, Mirza, Basit, & Saleem, 2023; Farid, et al., 2023; Shaukat, et. al., 2023; Aziz, et al., 2023; Niazi, et al., 2023; Niazi, Saleem, Basit, Iqbal, & Khan, 2023; Niazi, Qazi, Aziz, Basit, & Niazi, 2023; Qazi, Niazi, Mahmood, Basit, & Niazi, 2023; Naeem, Muhammad, & Niazi, 2021; Ali, Mushtaq, Niazi, & Raza, 2021; Basit, Qazi, & Khan, 2021; Qazi, Niazi, &

Basit, 2020; Faraz, Niazi, & Zafar, 2020; Niazi, Qazi, & Basit, 2019; Basit, Niazi, Qazi, & Imtiaz, 2019; Niazi, Qazi, & Basit, 2019; Haq, et al., 2018; and Basit, Qazi, & Niazi, 2020). Wavelet analysis used in wide variety of fields like medicine (Qassim, et al.2013; Hassan, et al. 2010; Scholkmann, & Dommer, 2012), geophysics (Liu, Hsu & Grafarend, 2005; Zamani, Samiee & Kirby, 2013; Grinsted, Moore & Jevrejeva, 2004), astrophysics (Li, Gao & Zhan, 2009; Bloomfield, et al. 2004; Donner & Thiel, 2007; Kelly, et al. 2003) etc.

It is also frequently used for research in the field of neuroscience, wind engineering, industrial aerodynamics, finance, biology, medicine, economics, meteorology, energy, computer science, engineering, electronics & telecommunication, management sciences, social sciences, acoustics, geodynamics, laser physics and nuclear science, signal processing, engineering, medical sciences, astronomy, project management, energy, manufacturing, engineering, research and development, insurance, oil & gas, transportation, geology, geophysics, oceanology, music, and environmental science. Different wavelet variants (e.g. CWT, WCOH, XWT, and WCA) to analyze the co-movements between the pairs of variables and pairs of entities are used for the investigation of relationships and movements (Crowley & Mayes 2009; Rua & Nunes 2009). Section 2 briefly reviews the related literature on the cryptocurrency market, while Section 3 presents the methodology used in this study. Sections 4 and 5 discuss the research's results and conclusions, respectively.

Literature Review

Admittedly, the review of literature plays a vital role in setting the context of the research. The critical review helps to avoid objectionable duplication, to sum up what is done?, and what is to be done? Therefore, the authors surveyed the online research libraries of MDPI, Frontiers, Wiley, Taylor & Francis, Springer, Emerald, Elsevier, JStor, DOAJ, Google Scholar, etc., using the keywords national saving, savings, public savings, national savings in Pakistan, and the ups and downs of national savings in Pakistan. An influx of research articles is available in an international context, but few studies are found in Pakistan.

Few of the studies are reported after critical review. Ahmad, Lensink, & Mueller, (2023) asserted that the subsidy and assistance is needed to encourage uptake savings and religious salience augments it. Islam, Usman, & Jamil, (2022) concluded that replacing traditional lighting with modern lights that emit diodes helps in saving. Tang, & Tan, (2014) proved that savings have high positive effect on economic-growth and more over savings and economic-growth Granger-cause each other.

The enhanced saving rates accelerate economic-growth in Pakistan. Masih, & Giordano, (2014) argued that reduction in water depletion achieves real water savings. Ong, et al. (2025) bolstered that the Telehealth approach clues to cost-savings in time and distance traveled. Nyffenegger, (2024) said that CBDC (Central-Bank-Digital-Currency) is used as a savings vehicle. Leeolou, et al. (2024) emphasized that described that the drug coupons for generic prescriptions donot always result in savings for recepients. Seidu, Mumin, & Abukari, (2025) depicted that propensity to save diminishes with the increasing proportion of peers with access to credit. Ding, et al. (2024) argued that worsening air-pollution significantly enhances household savings rates and there is found high savings phenomena among environment conscious households in China. Chen, et al. (2024) asserted that income uncertainty phenomenon is, in fact, mechanism linking the tax reform for increasing savings rates. Kouandou, & Zeh, (2024) concluded that informal savings help households hedging their future consumption against shocks.

Methodology

It is a quantitative type of a research study following positivist philosophy and deductive approach, and with an overall design: literature review, data collection, and analysis. Thirty years' time series dataset from the central bank of Pakistan regarding national savings have been used for the analysis. The sample period is November 30 1989 to September 30, 2019. The technique of data analysis is individual wavelet power spectrum for the variables (Table 1). The analysis is performed on MatLab software. Wavelet is zoom-in zoom-out process that is useful wave propagation, data compression, signal processing, pattern recognition, etc. Wavelet commonly used for investigating both frequency and time domains simultaneously through which better frequency resolution in approximation and detail coefficients can be observed. The authors followed classical mathematical algorithm for the wavelet transform. Wavelet is a methodology that has an exceptional potential to capture trends and variations present in the time series in the sample periods (Aloui & Hkiri, 2014; Aloui, et al., 2018; Aloui, Hkiri & Nguyen, 2016). Wavelet has an exceptional potential to capture the non-stationary behavior and time-varying trends present in the time series data (Aloui & Hkiri, 2014; Aloui, et al., 2018; Aloui, Hkiri & Nguyen, 2016).

Analysis and Results

This section of the study consists of analysis and results. The dataset as obtained from the central bank is presented in tabular form in Table 1. Complete original dataset is available with the authors. The study is designed for investigation of National Saving Schemes of Pakistan, therefore, last thirty years' time series dataset of month end balances (in Pak Rupees) of outstanding amount, account balance, certificates (outstanding amount), national savings bonds, and prize bonds of National Saving Schemes of Pakistan is used in analysis.

Table 1: The Dataset

Series Name	Unit	30-Sep-19	30-Jun-19	31-Dec-89	30-Nov-89
Outstanding Amount	PKR	3,918,925,888,000	3,933,706,146,000	148,434,000,000	160,495,000,000
Account Balance	PKR	811,818,115,200	774,981,509,900	40,871,000,000	47,025,000,000
Certificates	PKR	2,317,686,669,000	2,216,784,651,000	84,215,000,000	89,571,000,000
Bonds	PKR	137,000,000	137,000,000	-	-
Prize Bonds	PKR	741,589,833,600	893,888,703,700	23,348,000,000	23,899,000,000

The schema of analysis envisages to individual wavelet power transform that has the capability to capture the frequency and time locations i.e. variations in over the sample period i.e. November 30, 1989 to September 30, 2019. The Figures 1-5 are contour spectrograms that present three variables one on x-axis (time in months/years), two on y-axis (frequency periods), and three on color scale (intensity of variations i.e. low intensity on dark blue and high intensity on dark red color). On the x-axis the scale is distributed on thirty six months/four years, on y-axis wavelet frequency scale is 4-64 (low frequency to high frequency) and on color blue to red intensity scale is 1/64 to 64 (low to high) and same scheme is applied to the whole spectra (Figure 1-5).

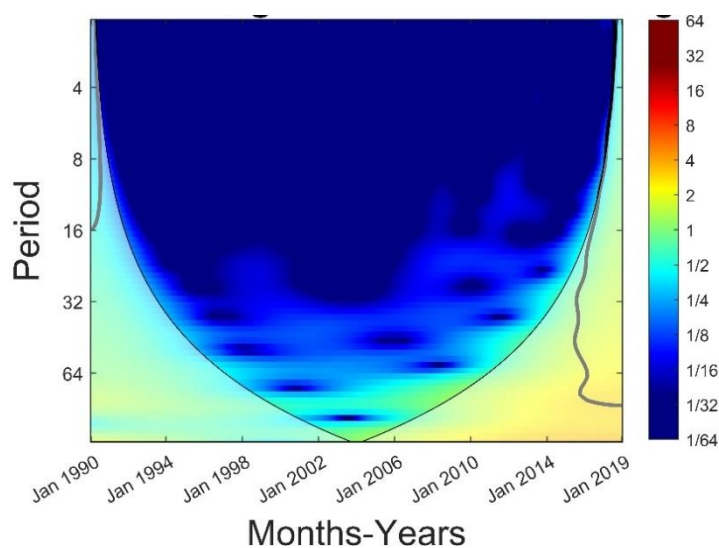


Figure 1: Wavelet Power Spectrum of National Saving Schemes - Outstanding Amount

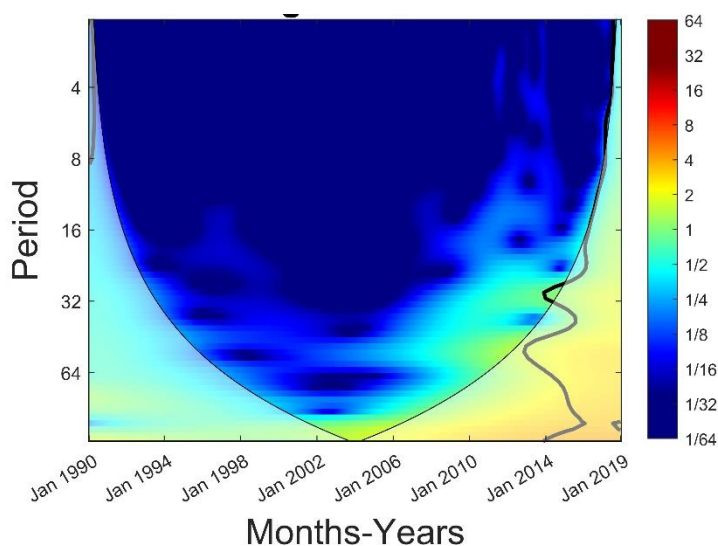
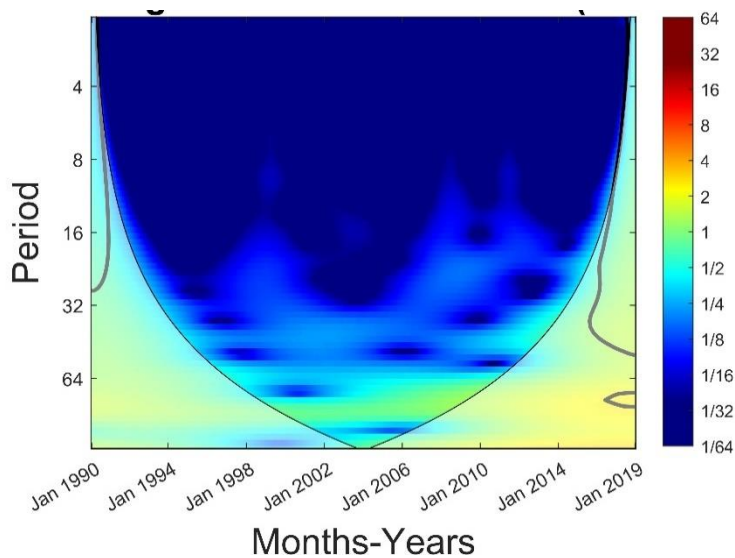


Figure 2: Wavelet Power Spectrum of National Saving Schemes - Account Balance



**Figure 3: Wavelet Power Spectrum of National Saving Schemes -Certificates
(Outstanding Amount)**

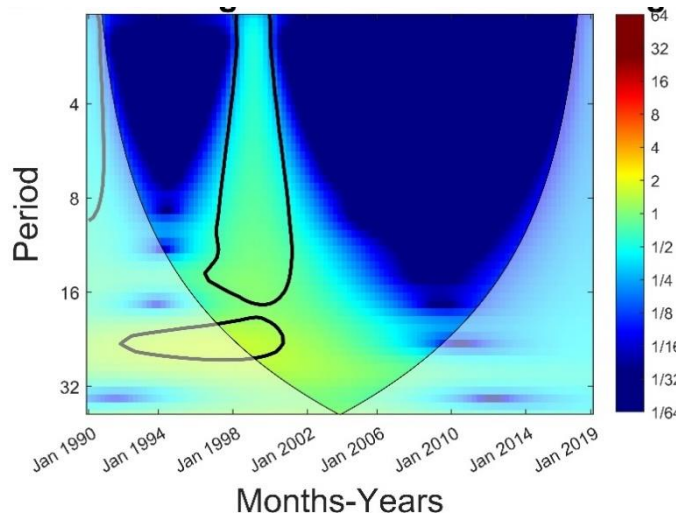


Figure 4: Wavelet Power Spectrum of National Saving Schemes - National Savings Bonds

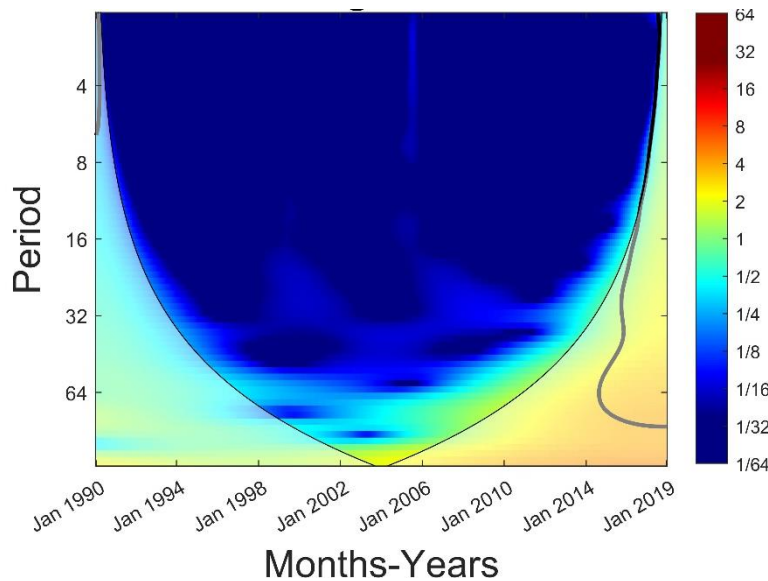


Figure 5: Wavelet Power Spectrum of National Saving Schemes - Prize Bonds

Inspection of the wavelet power spectra it is revealed that there are almost similar type of variations and trends in national saving of Pakistan overall except National Savings Bonds (Figure 4). There can be observed different patterns in the year 1987 to 2001 against wavelet frequency range 4 to 16 and there can also be found region encircled by black thick line at around 1993-2001 at wavelet frequency 16 to 64. These regions show moderate high intensity of variations as compared to outstanding amount, account balance, certificates (outstanding amount), and prize bonds of National Saving Schemes of Pakistan. The black thick outline (Cone of Influence popularly known as COI) encloses 5% cumulative significance level. The area enclosed by COI is lightly shaded to the extent it reached by using Monte Carlo techniques of generating simulated data of surrogate time series.

The issue under study has high degree of importance for the national governments particularly for Pakistan government. Therefore the study investigate this phenomenon with objective to provide some insights in the variations of the variable over the sample period. The study used real time data set obtain from the central bank of Pakistan. Employed wavelet transform technique for analysis and found that there can be observed different patterns in the year 1987 to 2001 against wavelet frequency range 4 to 16 and there can also be found region encircled by black thick line at around 1993-2001 at wavelet frequency 16 to 64. These regions show moderate high intensity of variations as compared to outstanding amount, account balance, certificates (outstanding amount), and prize bonds of National Saving Schemes of Pakistan. The research contributed individual wavelet power spectra of National Saving Schemes of Pakistan based on last thirty years' time series of month end balances (in Pak Rupees) of outstanding amount, account balance, certificates (outstanding amount), national savings bonds, and prize bonds of National Saving Schemes of Pakistan. It has insightful practical and theoretical implications since the study is built on real time data. Its findings are valuable for government institutions, and policymakers by giving them deep understanding of the phenomenon. It is a introductory study by the authors and the study is not free from limitations. First limitation is that of dataset which is for relatively shorter period. Second limitation is that of analysis the authors could generate only individual wavelet power spectra rather it would have been an extended analysis including create cross-wavelet transform and wavelet coherence transform etc. Therefore, the generalization of results is accordingly restricted and it is expected that future studies will be designed to overcome the limitations.

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Corporate Governance, Dividend Payout and role of Leverage: Evidence from Financial Sector of Pakistan

Dr. Muhammad Usman

Hailey College of Banking and Finance

Raza Ali

Hailey College of Banking and Finance

Dr. Samar Rahi

Hailey College of Banking and Finance

Abstract

This study aims to show the relationship between corporate governance, dividend payout and role of leverage is not been examined in Pakistan Financial Market. This article examines the impact of Corporate Governance (CG) on Dividend Payouts (DP), utilizing the mediating effect of leverage (LEV). While numerous researchers have explored the relationship between CG and Dividend Policy, this study represents the first investigation into this dynamic within the financial sector of Pakistan, specifically focusing on the intervening role of LEV. The indicators of CG examined in this study include Board Size (BS), Board Composition (BC), Management Equity Holding (MEH), and CEO Tenure. The data used in this analysis is drawn from the annual reports of the banking sector in Pakistan and was analyzed using SPSS (Statistical Package for the Social Sciences) software. The research is designed to focus on the financial sector in Pakistan, employing a sample of five major commercial banks, analyzed over the period from 2017 to 2023. The one-way ANOVA test was utilized to assess the level of significance, while correlation and regression analyses were performed to determine the associations between the dependent and independent variables.

Keywords: Corporate Governance, Dividend payouts, Leverage, Board Composition, Management Equity Holding

Introduction

The corporate sector of Pakistan consists of financial and non-financial institutions. These institutions are regulated by the State Bank of Pakistan (SBP), and Securities Exchange Commission of Pakistan (SECP). Financial institutions such as commercial banks, microfinance banks and development finance institutions are regulated by SBP while all non-financial institutions are regulated by SECP with a listing requirement in PSX. Corporate governance (CG) has been defined by Shleifer and Vishny (1997) as "the ways in which suppliers of finance to corporations assure themselves of getting a return on their." The Organization for Economic Cooperation and Development (OECD (1999) further delineates CG as "a set of relationships between the board of a firm, its shareholders, and stakeholders." Notably, a series of significant corporate scandals, including those involving Enron Xerox, and WorldCom in the United States, have undermined investor confidence, highlighting the critical role of corporate governance in both developed and developing economies (Achchuthan & Kajanathan, 2013).

According to Chung et al. (2013), corporations²⁰⁵ characterized by weaker governance structures are more susceptible to agency problems, primarily due to their deficient structural integrity,

which consequently increases shareholder risk. Hifzalnum and Mukhtar (2014) emphasize that effective corporate governance provides a framework for management to maximize organizational value on behalf of shareholders. Valenti et al. (2011) affirm that CG significantly enhances organizational performance by ensuring that shareholder interests are protected through the efficient allocation of resources and the pursuit of profitability. The overarching goal of a corporation is to optimize the utilization of shareholder assets (Griffin, 2010). Additionally, Ross et al. (2002) assert that dividend policy is a crucial element of financial strategy, as dividends serve as key indicators of a firm's financial health (Afza & Mirza, 2011). Quite a few academic researchers in his studies have recognized the critical role of corporate governance in the evaluation of a firm's financial decisions (Wald & Long, 2007). Effective corporate governance practices are vital for fostering economic growth and ensuring sustainability. Furthermore, (Shehadeh, Alharasis, Haddad, & Hasan, 2022) contended that the relationship between corporate governance and ownership concentration serves to mitigate agency problems and strengthen a company's capacity to attain stability.

Effective corporate governance serves to incentivize management to operate in alignment with the interests of shareholders, thereby mitigating agency costs and enhancing the overall performance of a company. Researchers have posited that variations in corporate culture, financial markets, market structures, and the theoretical frameworks employed can lead to significant differences in the characteristics of corporate boards across different countries. Pakistan operates as a capitalist market economy, similar to the United Kingdom and Germany, allowing for private ownership and governance structures. In contrast, China is predominantly characterized by a socialist market economy, wherein the state retains significant control over corporate governance (Ezeani et al., 2023). The vital objective of corporate governance is to regulate and guide the activities of operational firms by scrutinizing their practices and addressing any questionable conduct that may arise. This regulatory framework enhances both performance efficiency and effectiveness by actively mitigating errors and deviations through the judicious allocation of responsibilities and authority, in conjunction with the implementation of robust performance control mechanisms characterized by a high degree of transparency and oversight (Al-Rabba & Almahameed, 2020). In essence, corporate governance involves the board of directors holding management accountable for their performance and the resultant impacts of their actions on behalf of investors and stakeholders, thereby facilitating the achievement of the organization's objectives (Khan, 2022).

When a corporation achieves profitability, its executives are tasked with making critical decisions regarding the allocation of such earnings. Typically, there are two principal courses of action available: retaining the profits for the purpose of financing future business expansion or distributing the earnings to shareholders through dividends. Dividends represent a mechanism through which corporations return capital to their shareholders (Yilmaz, Aksoy, & Khan, 2024). According to (Oh & Park, 2021), a dividend policy can be conceptualized as an socially acceptable method of wealth distribution, as it provides investors with a substantial means of obtaining returns on their investments. Furthermore, companies utilize dividend policies as strategic instruments to communicate their future prospects to the market (Al-Najjar & Kilincarslan, 2016) (Farooq, Ahmed, Khan, & Munir, 2024). The rationale behind why firms opt to distribute dividends remains a complex question that has yet to be satisfactorily addressed, prompting ongoing research into this phenomenon (Sharma, 2021). To analyze this intricate puzzle, scholars have predominantly relied on two theoretical frameworks: agency theory and signaling theory.

From the perspective of agency theory, dividends play a crucial role in mitigating the agency problem that exists between the principal (shareholder) and the agent (manager), as they restrict the available income that managers might otherwise use at their discretion (Rama Seth, 2022). In contrast, signaling theory posits that the act of paying dividends serves as an indicator of the

firm's anticipated profitability and growth potential in the market. Hence, the decisions regarding dividend policies are critically important, not only for safeguarding shareholder interests from the tendencies of opportunistic management but also for reducing information asymmetry (Hasan & Habib, 2020). Overall, the formulation of dividend policies, similar to investment and financing decisions, is essential for the maximization of corporate value. In their efforts to align with the expectations of shareholders and stakeholders, companies employ various policies, among which dividend policy holds significant importance. This strategy serves as a critical mechanism for investors to generate returns on their investments and can be construed as a socially responsible approach to wealth distribution (Oh & Park, 2021). Through dividend policy, firms allocate a portion of their net profits to shareholders, thereby addressing their financial expectations.

In light of the prevailing emphasis on good corporate governance and socially responsible practices, it follows that dividend policy may also be influenced by the implementation of sustainability initiatives. This influence can be understood through the lens of the Triple Bottom Line framework, which integrates environmental, social, governance, and economic considerations into the long-term performance objectives of corporations (Montiel, 2008) (Van Marrewijk, 2003). According to (Benlemlih, 2019), corporate social performance (CSP) plays a significant role in shaping wealth distribution within firms. Consequently, when combined with dividend policy, sustainability may act as a critical value driver for both shareholders and stakeholders, thereby facilitating the alignment of corporate actions with the diverse objectives of various interested parties. Dividends can be pay out in various forms, including bonus shares. Dividend policy is inherently linked to broader investment strategies and capital structure plans within the realm of corporate finance. Despite numerous studies addressing dividend policy since the mid-1990s, it remains an area requiring further exploration by researchers (Black, 1976). A fundamental question that arises in this context is the of dividend policy and the critical decisions that must be made therein.

The term "dividend" denotes the allocation of a portion of current profits or retained earnings that the board of directors has resolved to distribute to shareholders. This distribution typically reflects a proportional share of the firm's profits relative to each shareholder's investment. While dividends are most commonly paid out in cash (referred to as cash dividends), corporations may also opt to issue stock dividends, whereby shares are allocated to shareholders. Stock dividends are often colloquially referred to as stock splits. Dividend policies provide a strategic framework for management to ascertain the appropriate proportion of earnings to allocate for distribution to shareholders. In this regard, management generally adopts one of three approaches to dividend policy: residual dividend policy, stable dividend policy, or a hybrid of the two. Under a residual dividend policy, the management prioritizes financing projects using internal sources of funds, deferring dividend decisions until after meeting investment needs. Additionally, management prefers to maintain a consistent leverage ratio prior to making any determinations regarding dividend payouts.

Main issue

The CG aims to boost investment by securing and upholding rights and interest of shareholders (Ongore and K Obonyo, 2011). The existing studies provide conflicting results of (CG) and (DP) like Gugler and Yurtugo (2002) they studied a relationship between CG and dividend policy in germany in which results showed significant negative relationship. Mitton and Todd conducted a study by using 19 emerging economies results showed significantly positive affiliation between (CG) and (DP). Hamdouni (2012) finds a insignificant negative relationship of CG and (DP). D' Souza and Sexana (1999) disagrees that agency cost is negative association with (DP). Afza and shehrish (2011) carried a study by using sample 42 firms to check the connection of board mechanism with (DP). This study tells how CG⁹⁷ play an vital role in Management of LEV and (DP). Contribution of this research is intervening variable which is studied in financial companies in Pakistan.

Reasons behind to choose Pakistan Financial market for analysis:

There exist numerous justifications for selecting Pakistan as a subject for analytical study. Firstly, it presents a distinct array of organizational, commercial, social, and political frameworks, coupled with the recent expansion of its capital market. Consequently, this investigation has the potential to contribute significantly to the financial literature, which is predominantly characterized by research on developed markets. Secondly, the agency conflicts that arise between managers and investors, as well as between majority and minority shareholders, are notably more pronounced in developing economies such as Pakistan than in their developed counterparts (Moin, Guney, & El Kalak, 2020). Furthermore, the inadequate corporate governance and the deficient legal framework characteristic of the Pakistani market (Farooq & Noor, 2021) facilitate alterations in firms' dividend policies that align with the interests of insiders. Thirdly, in contrast to countries with Anglo-American models, where ownership is typically dispersed, firms in Pakistan are largely governed by controlling shareholders. Lastly, the literature examining the dividend policies of firms within Pakistan remains scarce (Yousaf, Ali, & Hassan, 2019), thereby an inquiry into the effects of CG, dividend payout and role of leverage of firms listed on the Pakistan Stock Exchange (PSX).

Main objective

To evaluate the influence of corporate governance on the financial performance of financial institutions in Pakistan.

Literature review

The relationship between corporate governance (CG) and dividend payouts (DP) has been the subject of extensive study among specialists; however, empirical research on this relationship remains limited, leading to mixed outcomes. Despite these variations, several studies have identified a positive correlation between CG and DP, suggesting that strong corporate governance is associated with higher dividend payouts (Michael & Roberts, 2006; La Porta, Shleifer, & Vishny, 2000).

Corporate governance (CG) is crucial to an organization's success, as it facilitates the attainment of both social and financial objectives (Ehsan, 2019) (Farooq, Noor, & Ali, 2021). The Organization for Economic Co-operation and Development (OECD) outlines in its 2004 principles of corporate governance that such governance serves as a mechanism for defining organizational goals and the strategies required to achieve them. Broadly, CG encompasses the frameworks, policies, rules, and regulations established by regulatory bodies to safeguard the interests of minority capital providers and all stakeholders, while simultaneously striving to fulfill the organization's objectives. Effective implementation of CG practices not only benefits individual firms but also enhances the overall attractiveness of a country for foreign investment (Bhatt & Bhatt, 2017). The agency theory proposed by (Michael C. Jensen, 1976) focused on the conflicts between shareholders, creditors and managers. The foundation of corporate governance study is agency theory (Berger, Ofek, & Yermack, 1997; Easterbrook, 1984; Morck, Shleifer, & Vishny, 1988; Rozeff, 1982). Agency theory, according to (Farooq, Al-Jabri, Khan, Ali Ansari, & Tariq, 2022; Frank & Goyal, 2009), is a broad and covert interpretation of the trade-off theory. When there is a conflict of interest between the agents and the principal, which produces information asymmetry and the costs of risk sharing. When there is a conflict of interest, managers make judgments on financing (i.e. capital structure) based on what is ideal for them. Managers as a result prioritize their interests over the interests of the company. The agency problem prevents management from maximizing company value and shareholder wealth. Debt financing can help to reduce this conflict of interest.

The signaling theory argues that management should use a dividend policy to signal the organization's good health to reduce information asymmetry between insiders and outsiders.

According to this theory, earnings and dividends are linked. Higher dividends send positive signals to shareholders and vice versa.

The theoretical frameworks employed to investigate this relationship include signaling theory, free cash flow theory, and life cycle theory. Signaling theory posits that market prices influence the dividend payout ratio, asserting that while a company's dividend policy may not directly affect its value, it can influence share prices through shifts in market perceptions. The underlying assumption here is that insiders possess superior knowledge regarding future cash flows and the profitability of the firm (Bhattacharya, 1979; Miller & Rock, 1985; John & Williams, 1985).

(Jensen 1986) Free cash flow is associated with agency cost sometimes when firm gain surplus of FCF then there is no profitable investment opportunities so manager will do to hold the cash on their hands for the benefit of their own interest. Payout ratio is the best idea to reduce the conflict between managers. Those companies which they are performing bad governance due to managerial entrenchment and predict more future cash flows. if a company has positive NPV projects then will retain the dividend and reinvest in the other project of the business but if a firm does not have positive net present value projects, they interested to provide dividend to shareholders.

John and knyazeva (2006) described that good CG retain the dividend and bad CG will pay the dividend so substitution theory states that the large dividend payout companies execute dividend policy as a weak CG so it's crucial for firms with this mechanism therefore it's an important element for well reputed organization. On the other hand, they need for the reputation of the company with weak shareholder rights definitely need for the dividend as a result it compensates the weak shareholders rights and then give higher DP to their firms.

Furthermore, Miller and Modigliani (1961) introduced the dividend irrelevance theory, commonly referred to as the MM Theory. This framework argues that, within an efficient capital market, dividends are not essential to shareholders. The theory asserts that dividends do not have a discernible impact on a firm's valuation, asserting that shareholders remain indifferent to whether they receive returns in the form of capital gains or cash dividends.

In this study, we assess the dividend policies of the sample firms utilizing two primary proxies: the dividend payout ratio and the dividend yield. The dividend payout ratio serves as a widely recognized indicator of dividend policy, reflecting the proportion of earnings distributed to shareholders as dividends (Ben Salah & Ben Amar, 2022; Cheung, Hu, & Schwiebert, 2018; Dahiya, Singh, & Chaudhry, 2023; Yilmaz et al., 2024) (Farooq et al., 2024). The following formula can be used to compute the dividend payout ratio:

Dividend Payout ratio = Dividend per share / Earnings per share

The second dividend policy proxy is the dividend yield, which is also widely used in the existing literature (Dewasiri & Abeysekera, 2022; Eckbo & Verma, 1994; Farooq et al., 2024; Yilmaz et al., 2024). The dividend yield can be calculated with the help of the following formula:

Dividend Yield = Dividend per share / Stock price per share.

Literature from Pakistan:

Shah et al. (2011) conducted a study investigating the influence of ownership structure on the dividend policy of firms in Pakistan, revealing a positive association between the two variables. Similarly, Afzal and Sehrish (2011) explored the relationship between board characteristics and dividend policy, also yielding positive results. These findings contribute to the growing body of literature examining the determinants of dividend policy in the framework of Pakistani firms.

Factors influence dividend policy

BS

Yermack (1996) disputes that big board has less helpful method however Klein (2002) argues large boards have effective corporate mechanism so it shows the positive result but these results showed mixed outcomes.

Mansourinia et al (2013) carried out a study of 140 companies in Tehran Stock exchange for the five year data 2006 to 2010 which shows positive relationship between (BS) and (DP).

BC

An independent board has independent directors there is less chances of conflicting of interest because independent board of director have no material interest in company. According to agency theory large portion of independent board of directors make available well organization performance (Ramdani and van, 2009). De Angelo et al (2004) made a study of agency cost and dividend payments he revealed that agency crisis can be prevented by (DP).

CEO Tenure

According to Wanyonyi and Olweny (2013) CEO appointed as short-term contracts and additional concern about the organization presentation during their own tenancy so this can be cause for short term and medium term goals. It is important for management to give them extra benefits, incentives for motivating CEO practices to make it better. Because his finance interest is attached with organization. Thus, it is negatively associated with DP because shareholder confidence can be shake so shareholder not invested his money in that organization just because of CEO tenure.

MEH with DP

According to Iskandar et al (2011) the high portion of management rights become cause of going concern of a firm as management accomplish legitimately by not protecting its economic interest but also overall economic interest of whole shareholders.

CG and DP

According to Mayer,(2007) as a way of arranging and ensuring interest of investors and managers inline that firm is working for the benefit of investors. if bad governance occurs then investor will not invest their money due to bad corporate mechanism so ultimately DP ratio effected.

Mediating variable

LEV

Firm LEV always tends to external financing of capital structure. Large board are well-known to pressure management to shrink the scope of debt in organization. Reduced LEV will lessen the level of monitoring. High debt level will increase the board member for effective monitoring. (Adams et al .2005; Jirapon et al 2012) firms which has weak CEO Then financing decision will be made BOD. Maintain this interest between executives and shareholders; companies prefer to use high LEV.

Zwiebel (1996) quarrels that in array to evade the restricts resulting from high LEV. The risk of bankruptcy and jobless. Self-interested CEO have bent to decrease LEV. Positive association between BS BC and LEV outside directors will lead to inject more independent directors in board.

HYPOTHESIS DEVELOPED

H1: CG has no statistical significant impact on dividend policy.

H2: CG has statistical significant impact on LEV.

H3: LEV significantly mediates the relationship between CG and dividend payout policy.

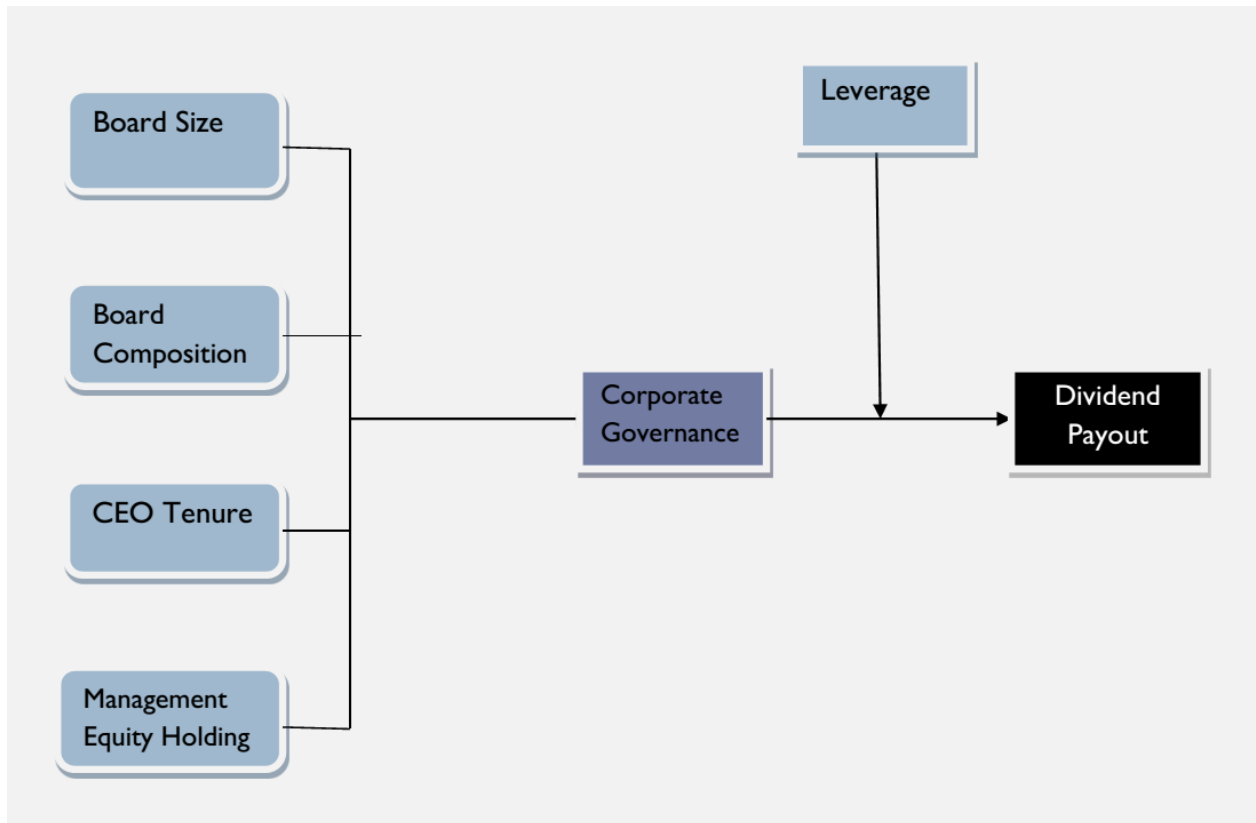
Research Methodology

This study used a co relational design. Panel data has been used in this current research and data has been collected from annual reports and financial statement of banking sector in Pakistan for the year of 2017 to 2023 and the selected five commercial banks among population. One tailed T test run to prove the level of significance and multiple regression analysis run to test the association of all variables and coefficient of beta run to test the mediation role of LEV.SPSS 20.0 version is used to analyze the data.

Banks list:

Sr no.	Bank name
1	Muslim commercial bank
2	Alflah bank
3	Allied bank
4	Al Barka bank
5	Faysal bank

Conceptual framework



Model specification

DP (DP ratio)

BS (Logarithm of no of directors in organization)

BC (ratio of independent directors)

CEO tenure (logarithm of no of years served by CEO)

MEH (Proportion measured/% of equity ownership)

LEV (Total debt/total Assets)

Data Analysis:

Table 1: Descriptive Statistics

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Descriptive Statistics

	Mean	Std. Deviation	N
DP	37.7593	25.16411	30
BS	.494370	.3615709	30
BC	.46930	.263504	30
CEO tenure	.297570	.0124915	30
Management equity holding	975.85990	75.503508	30
LEV	5.4700	1.74911	30

Table 1 shows that no. of observation is 30 to analyze data (DP) mean value is 37.75 and the results of LEV reveals that 5.47 mean value and other independent predictor has its mean value.

Table 2: Correlations Analysis

Correlations Analysis

		DP	BS	BC	CEO tenure	Management equity holding	LEV
Pearson Correlation	DP	1.000	.609	.463	-.194	.059	.694
	BS	.609	1.000	.903	.042	-.042	.908
	BC	.463	.903	1.000	.050	-.187	.823
	CEO tenure	-.194	.042	.050	1.000	-.321	.148
	Management equity holding	.059	-.042	-.187	-.321	1.000	-.113
	LEV	.694	.908	.823	.148	-.113	1.000
Sig. (1-tailed)	DP	.	.000	.005	.152	.378	.000
	BS	.000	.	.000	.412	.412	.000
	BC	.005	.000	.	.396	.161	.000
	CEO tenure	.152	.412	.396	.	.042	.218
	Management equity holding	.378	.412	.161	.042	.	.276
	LEV	.000	.000	.000	.218	.276	.

N	DP	30	30	30	30	30	30
	BS	30	30	30	30	30	30
	BC	30	30	30	30	30	30
	CEO tenure	30	30	30	30	30	30
	Management equity holding	30	30	30	30	30	30
	LEV	30	30	30	30	30	30

According to Table 2 results DP has significant associated with BS BC and LEV at the level of 5 percent and other variable CEO tenure and MEH are showing insignificant results.

Table 3: Multiple Regression Analysis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.791 ^a	.626	.548	16.90945	.626	8.045	5	24	.000	1.132

Table 3 results explains determination (R) is .791 this value tells strong relationship between CG And DP.however CG explain DP R2 is .626 but significance value is 0 which means CG do not adequately work with DP and D Watson value is 1.132 that shows the there is no auto correlation exist its value should be fall between 1.5 to 2.5.

Table 4: ANOVA test

Table 4

ANOVA test

Model	Sum Squares	df	Mean Square	F	Sig.
1 Regression	11501.438	5	2300.288	8.045	.000 ^b
Residual	6862.308	24	285.930		
Total	18363.746	29			

Table 4 results whole model significant at level of 0 with value of F is 8.045 according to researchers' level of significance is 0.05 this test shown that CG practices does not create impact on DP. Hence CG has no impact on DP.

Table 5: Regression Coefficients

Model	Un standardized Coefficients		Standardized Coefficients		Sig.	Correlations			Collinearity Statistics	
	B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
Constant	177.988	105.148		1.69	.103					
BS	8.762	29.299	.126	.299	.767	.609	.061	.037	.088	11.3
BC	-45.114	29.679	-.472	-1.52	.142	.463	-.296	-.190	.161	6.20
CEO tenure	-666.663	273.149	-.331	-2.44	.022	-.194	-.446	-.305	.847	1.18
Management equity holding	-.005	.047	-.015	-.107	.916	.059	-.022	-.013	.774	1.29
LEV	14.612	4.475	1.016	3.26	.003	.694	.555	.407	.161	6.21

According to table 5 results show that mediating variable LEV has significantly positive effect with 0.003 value on relationship of all other independent variables therefore H2 hypothesis has significant impact. Tables 5 also show all independent variable has not statistical influence on DP because all variables values are greater than 5 % level of significance. LEV variable has positively impact on DP ratio and creating mediation between predictor and regressor.

That's why H3 hypothesis created influence. LEV fully mediate between CG And DP because this test is run in

Regression analysis while LV and CG proxies enter in a same test then both coefficient value has shown in above which tells

If predictor beta insignificant and mediator significant then fully mediation but if both are significant it means partial mediation.

Discussion and Conclusion

The purpose of this study to evaluate the impact of CG on DP Of financial sector in Pakistan. The result shows that BS, BC, management equity holding, CEO tenure and CG statistically insignificant associated with DP and significant with mediator LEV. This study is conducted first time in Pakistan banking sector by adding new variable of CEO tenure and intervening variable LEV. Good governance give confidence to shareholders for investment decisions and reduce the external debt by monitoring effective management.

Future suggestion

After this study there is some limitation which cannot fulfill by researcher and some future suggestion as well. This study can also be conducted on the base of interviews with chief financial manager and investors to check the association between CG and DP. Due to shortage of time researcher selected limited banks but in future any researcher conducts research by enhancing its sample size and also applying and other technique on it.

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The Impact of Data Analytics on Business Decision-Making: A Study of Data-Driven Strategies

Azan Ahmad¹, Dr. Muhammad Adnan Sial²

¹School of Business and Management, Information Technology University

²Assistant Professor: UE Business School, Division of Management and Administrative Science, University of Education, Lahore

Abstract

This research explores the effect of data analysis on organizations' decision-making with regard to how analytics-based solutions affect digital marketing tactics and customer interactions. The research objectives are to establish how data analytics can improve organisational performance, especially in the management and strategic decision-making process, and discuss the ethical issues of the fake news phenomenon in the context of interpretational manipulation. A formal research design was used, and the quantitative research design was used with structured questionnaires administered on Google Forms to 103 participants using a convenience sampling method. This study was non-synchronized ex post facto research, where variables and their relationships were investigated without direct intervention, and the study's time frame was cross-sectional to obtain data at a given time only. Causal and descriptive mediation analysis was conducted using PROCESS Hayes macro in SPSS 18. As a field study, this research emphasises the importance of higher-level marketing and data analysis in enhancing decision-making in communicating marketing messages, managing customer interfacers effectively, and promoting products effectively and efficiently. However, it comes with an ethical concern about the way data will be used in an unethical manner about advertising, specifically about astonishingly crafted darts, thereby underlining principles and practices of ethical standards and consumer protection. Of course, using convenience sampling and having a relatively small sample, the study demonstrated the potential of explaining how big data is used in modern business processes.

Introduction

Data analytics has rapidly developed into a key primary operational tool in organizations, which enables companies to make accurate analyses that improve business operations, productivity, and sustainability. Decision-making is not an act of intuition anymore, especially in the rapidly growing business environment nowadays. Instead, the usage of metrics derived from big data analytical tools such as the application of statistical techniques, machine learning and other analytical tools on a large trove of data helps the various businesses to make more informed and strategic decisions. In this context, the need for accurate, timely, relevant and meaningful information has never been so important as organisations deal with increased operational and market environment complexities (Pipino, Lee, & Wang, 2002).

The term data analytics can be described as the processes, methodologies and tools for processing raw data with an aim of arriving at valuable information on which crucial business decisions can be based. It is therefore a multidisciplinary process requiring input from statistical and information technology, business and substantive fields. One good way of utilizing data is to grow it with an institution to ensure that data processing becomes part and parcel of decision making. A couple of papers have briefly mentioned today's heightened interest in analytics as a management approach and how managers and employees are expected to seek solutions to their issues within the data and then utilize the answers in driving managerial and operational decisions. With the help of modern data analytics, new forms of breakthrough solutions are gaining massive popularity as operational, tactical, and strategic tools that help to reveal and evaluate the potential effects of changes, recommend the right actions to make, and diagnose the

causes and impacts of those changes. Based on the literature, Davenport and Harris (2017) argue that competitive benefits derive from the incorporation of analytical capabilities by organizations over a reliance on intuition.

Research Problem

While data analytics is already well implemented in developed countries' economies, the application of such tools to decision-making at various organizations in the developing countries, particularly in Pakistan, is still a rather uncharted realm. Despite the current studies addressing the possibility of using data-driven approaches in improving decision-making, little focus has been accorded to how these approaches affect consumers through digital marketing within developing economies. Equally important, the said legislation raises a number of concerns mainly because it is hard to distinguish between ethical marketing strategies and scams. This research aims to fill this void by focusing on analyzing the effects of data analytics on major business success indicators embracing customer attraction and retention, conversion rates, and trust creation with the operational efficiency acting as a moderator between data analytics and business performance. Furthermore, this research will include organisational culture as a variable that may moderate ethical data-driven marketing decision-making. This problem is important because it raises questions about the practical use of data analytics for ethical decision making in less researched environments.

Significance of Study

This study has huge importance in understanding the business decision-making process within the area of data analytics, especially in the emerging market of Pakistan. Through establishing how data methodologies influence consumer behavior through digital marketing, the study makes a modest addition to knowledge in data analysis for business. It particularly explores the moral issues surrounding data driven marketing, with reference to how so called 'marketing' can often be on the precipice of downright frauds like scams. Bearing in mind that digital marketing and data analytics are relatively new and dynamic tools in today's business environment, the results of this study could be useful to managers who want to enhance their decisions and overall organizational goals and objective concerning crucial business processes such as customer engagement and trust, aimless rates among others. Most of the prior literature has examined how data analytics strategies are executed in developed environments, whereas little is known about how these are performed in developing environments such as Pakistan. This research fills that gap by considering the benefits and risks of the data analytics as a tool in business decisions making.

Furthermore, the examiner focus on how operational efficiency moderates a link between data analytics and business performance and the moderating impact of organizational culture. It is important to understand these dynamics particularly in a context of rapidly growing data-driven market competition. Hence, this piece is useful not only to the managers and decision-makers of firms but also to policy makers and other scholars who may wish to promote ethical and efficient data-based decision-making in developing nations.

Motivation of the Study

This research is inspired by the capabilities of data analytics in revolutionising the way enterprises make decisions, improve customer relations and redesign business processes. Since business intelligence has become a significant factor that defines an organisation's competitive advantage, the capacity to use business intelligence is the key competence among modern organizations. Global adoption of data analytics has been noted yet there is still little work done that addresses its use in developing country contexts such as Pakistan and this research will fill this gap by examining its use in the context of digital marketing strategies and their ethical concerns. Several educational research have pointed that firms which make use of data analytics are more likely to

realize enhanced consumer satisfaction, faster decision-making and enhanced operational efficiency. However, no detailed literature review was done on the risks that the independent practice may pose and hence the need for this study. The risks include deceptive marketing practices and scams. This research seeks to address this void by seeking to understand how businesses can employ data analytics for growth, especially with regard to consumer trust.

The volume increase in digital marketing, the continuous demand for customers' trend analysis, and the recent outrage for ethical marketing strategies as the main drivers of this study. This paper aims at helping the businesses in Pakistan and other similar developing nations to understand how they can adequately harness the opportunities provided by data analytics while managing for pertinent risks, assembling ethical and timely guidance.

Literature Review

1. The Evolution of Data Analytics in Business

Data analytics can, therefore, be considered an advanced form of data processing which had origins in the twentieth century when many companies had started using statistical analysis for their decision-making. Operations Research and Decision Theory were the two initial models that were used with an aim of improving organizational performance through use of quantitative data. Nevertheless, the turning point towards using data was the information technology which brought the idea of the so-called 'big data' and therefore made data analysis indispensable in today's business world.

Firstly, the data analytics technique was chiefly employed for categorizing the type of data and explaining its characteristics, what they are and how they have been performing. Still, during the recent couple of decades, due to the growth of the processor capability, the influences of machine learning and artificial intelligence appeared and gave a new impulse to the development of the discipline. Nowadays, there are descriptive, diagnostic, predictive, and prescriptive analytics that help the higher management and other levels of an organization. Each of these types of analytics serves different purposes:

- **Descriptive analytics:** Provides insights into what has happened in the past.
- **Diagnostic analytics:** Seeks to understand why something happened.
- **Predictive analytics:** Forecasts future outcomes based on historical data.
- **Prescriptive analytics:** Recommends actions that should be taken based on predictive models.

2. Role of Data Analytics in Business Decision-Making

The contribution of data analytical solutions today to business decision making is vast. Over the years as information becomes abundant and readily available firms have started to incorporate data analysis techniques in every aspect of the business ranging from process improvement to customer satisfaction and innovation. These tools range from business intelligence (BI) platforms, such as Tableau and From Power BI, to medium level language like Ms Excel, all the way up to high level programming languages like Python and R used in statistical analysis, machine learning, and predicting (Bukhari, 2020; Chen, Chiang, & Storey, 2012).

Descriptive analytics as an instance enables business to view past data and trends within the firm then make conclusions that are tactical. **Predictive analysis** allows organisations predict future trends, and therefore prepare for the changes in consumer trends or other influential factors, such as the market trends. Finally, **prescriptive analytics** builds on forecast analysis by giving guidance to the managers what actions they need to be taken, and where business organizations need to be flexible to survive due to dynamic business environments. Davenport and Harris

(2017) point out that organizations that embed data analytics deeply into their decision-making processes tend to outperform their competitors. By analyzing data at greater depths, businesses can make decisions more rapidly and accurately, positioning themselves to be more competitive in their respective markets (Davenport, 2006; McAfee & Brynjolfsson, 2012).

3. The Importance of Data Quality in Analytics

The application of data analytics tools has enormous possibilities however, the quality of the input data is always essential. Bad quality data leads to bad quality information which leads to bad quality decisions which may even be detrimental to organisation's well-being. In the concept, accuracy and completeness of collected data have been defined as one of the priorities by the authors Pipino et al., (2002). If data sample does not meet these criteria its efficacy for data analysis is questionable.

It must be stressed that organizations need to have a rigid policy in the gathering, processing, validation of data among others. Good data validation processes for data accuracy, currency and format are all essential in arriving at good decisions. This is true because poor data means that one may end up getting major garbage out, which is basically due to the input being garbage. High quality data cannot be overemphasized as it impacts outcomes of analytics, especially reliability and validity as pointed out by Sharma and Batt (2020).

Also, companies that establish data quality strategies require lower risk and higher return on their analytics ventures than their counterparts do. The quality of data collection and of the processes used to analyse data are critical elements that define how good it is to extract relevant information that can impact business decisions.

4. Data-Driven Culture: A Crucial Mediator

Afterwards, the last but not the least are organizational culture which more often determines the fate of the data analytics projects. Creating such an analytical culture—which is characterized by the new decision-making being based on data as opposed to experience or gut feelings or carry-on practices—will help to optimize the return on data. In the digitized work environment, employees at all organizational levels utilize data in their decision-making process and arrive at correct solutions (Brynjolfsson & McElheran, 2016; Kiron, Prentice, & Ferguson, 2014).

A strong utilization of data is to develop it with an institution so that data analysis is integrated into the decision-making process. Several papers have touched on the recent increased focus on analytics as a management tool and how both managers and employees are encouraged to look for answers to their problems within data and use the answers as a basis for making strategic and operational decisions. Likewise, McAfee and Brynjolfsson (2012) assert that firms with a better information management culture are better placed to turn information into managerial decisions to achieve better performance on various indicators.

But to report and liberate data with operational teams is not without its trials. Some of the challenges of adopting data driven processes in an organization include: Organizational inertial, resistance to change, and inadequate data literacy among the organizational workforce. To eliminate these challenges, organizations are required to develop training that will improve employees' critical thinking abilities and data culture. Moreover, leadership has to encourage the use of data in decision making by using data in own planning processes.

5. The Role of Data Analytics Tools in Business Operations

Business intelligence and analytics are playing an increasing role in most organisations today. Such tools enable the firm to process humongous data hence give timely knowledge for operations and strategic planning. Tableau, Power BI, Qlik View and other BI tools are used for creating data visualization and going through dashboards reflecting KPIs. These tools enable

management to make decisions based on actual information that is at their finger tips (Gandomi & Haider, 2015).

Python and R are the examples of languages used to perform more profound statistical analysis and machine learning. These programming languages provide an ability to draw models that can predict the future tendencies; in other words, business can make proper and not reaction-driven decisions. For example, predicting models enable business organization to predict customer demand, to refine supply chain and to minimize expenses.

Also, the incorporation of the AI and ML into analytics tools' capabilities have revealed more horizons for the choice. With AI, one can enable the mechanization of the extraction of trends and inconsistencies within data which can be of benefit to businesses to identify opportunities and threats on the go. A lot of the time machine learning algorithms can learn from the data and build on the earlier models, improving the accuracy of the model as forecasts accumulate (Erevelles, Fukawa, & Swayne, 2016).

6. Challenges in Implementing Data Analytics in Decision-Making

The application of data analytics brings a lot of advantages, like more efficient forecast, wider understanding of activity, and enhanced performance. However, there are several challenges that organisations experience while trying to implement data analytics in organisations. Below is a detailed discussion of some of the most common challenges:

6.1. Data Silos

Data silos are data repositories that are contained in discrete systems or in organizational subunits hence making sharing or integration of the information across the subunits and the entire organisation very hard. This problem is most obviously seen where multiple departments have their own database and use different software to store their data. These silos present several barriers:

- **Limited Access to Comprehensive Data:** When data is fragmented across various organizational structures, few can fully comprehend the entire organization. For instance, while marketing, sales, and customer service all have pertinent data, data that could possibly be utilized in the formulation of organizational strategy if compiled together. This situation hinders integrated decision-making to result in unsatisfactory results across different areas of the organization.
- **Inconsistent Data Formats:** Some departments may use structured data, others unstructured data, or complex formats that are hard to merge and analyze. For example, one team may manage customer relationship using CRM while the other keeps customer information in excel sheets. This disparity means more time and effort to adapt data into designs that can be conveniently used by decision makers.
- **Delayed Decision-Making:** Due to the fact that, the needed data may not always be available or easy to obtain, this may lead to slow decision making. They can end up having to ask other departments for that data, this slows down the process and real-time decisions cannot be made.

The issue of data isolation must be solved by developing a centralized data database or employing highly effective integration tools enabling data access across departments. This is especially so for big data analytics large-scale where practitioners need robust data sets to make informed conclusions.

6.2. Lack of Data Literacy

However, but one of the biggest challenges is that people in the organization still have relatively low levels of data literacy. Data literacy is a condition in which individuals can read data, manipulate them, analyze them, and reason about it. Even where companies implement complex analytical tools in their firm, it will not be much useful if the people in the organization cannot utilize the data appropriately.

- **Difficulty in Understanding Data:** Employees who may not have well-developed data literacy skills can barely understand (or even decode) basic and simple analytical insights as characterized by predictive and prescriptive data analytics. This can lead to making wrong conclusions or at best to getting no valuable information from the results.
- **Ineffective Communication of Insights:** While in many organizations data analysts might even prepare good reports, if the other employees in the organization cannot understand the reports and assimilate them into their work, then the reports are essentially useless. This lack of communication weakens the effectiveness of decision making that primarily relies on data.
- **Limited Application of Data Analytics:** This explains why even when decision-makers have data at their disposal the information is not used often because employees are averse to data. Instead of using the findings of the analysis, teams might revert to conventional practices of decision making relying on personal feelings and prior knowledge.

On this account, organizations need to embark on training that aims at improving data proficiency of the employees. Some of the intervention may be; practical sessions regarding methods of data analysis, practical familiarization with routine analytics tools, creating awareness among the faculty regarding data usage in decision making.

6.3. Resistance to Change

Culture is one of the major challenges to the adoption of data analytics in organizations. As a result, they could decide to downplay the process by choosing to work with old forms of decision making rather than the new data-driven methods of data analysis. This resistance can take various forms:

- **Comfort with Established Practices:** People may prefer to rely on explicit information or to use the knowledge they or other employees have gained in the course of their work over a period of time. The identified norms can be worked through using data analytics; however, this is a revolutionary practice that can be seen as disruptive.
- **Fear of Job Displacement:** Some of the employee might think that the use of big data makes their job redundant especially when decisions involve the use of Artificial intelligence or machine learning algorithms. With this fear comes resistance, especially by the middle management since they might be threatened by excessive use of automation on tasks that can otherwise be done by humans.
- **Cultural Barriers:** This therefore implies that, in some organizations, decisions made are power based where structured power relations are bound to be disrupted by the introduction of data processes meant to support these decisions. For instance, data democratization could see decision rights moving from organization's top managers to middle-level data-oriented teams, and resistance from the top.

This understanding means that in order to eliminate such resistance, organizations must aim on change management. When implementing analytical cultures organizational leadership, the following actions should be taken; this is by presenting the advantages of analytical knowledge sharing and productivity, engaging the employees, as well as offering the appropriate tools and development programs. Besides, one must be wary of resistance from the subordinates, the

organization's culture that supports, encourages, and expects innovation and learning can also go a long way in reducing resistance.

6.4. Data Privacy and Security Concerns

Since more and more organizations depend on data for their decision-making they also accumulate and store huge volumes of large information which includes their customers, financial, and proprietary information. The rise in data collection brings significant privacy and security concerns:

- **Compliance with Regulations:** The United States' invasion of privacy was shocking by the enacted laws like the General Data Protection Regulation (GDPR) in Europe and the California Consumer Privacy Act (CCPA). If the above regulations are not followed then such companies can face huge penalties and repercussions as well. For example, organizations under GDPR must make sure that they only gather data after getting permission and the data have to be safeguarded against being leaked. These regulations make the need for organizations to adhere to more strict measures when handling data, a factor that makes data analytics process slightly cumbersome (Floridi et al., 2018).
- **Risk of Data Breaches:** In big data collection, the chances of getting hacked, or there is a data leak are high as compared to small data. Business information can be vulnerable to hackers and, thus, bring relevant client data to tremendous vulnerability. They are generally manageable and may cause loss of trust, financial loss, and reputational losses thus making data security an important issue.
- **Balancing Data Collection with Privacy:** This means that organizations must also identify a way in which they can acquire enough data for analysis without infringing the rights of customers. Consumers are slowly opening their eyes to their rights to data, and any company that may be deemed to have infringed on the privacy rights of its customers may be punished by the two parties. To balance between the two aims, it is imperative for organisations to preserve a good image of the company to the public while at the same time use data in their decision making.

More effort needs to be applied here and these apprehensions call for stringent data governance policies. It's important that organisations should ensure that they have data security policies such as data encryption, access controls, and security check on the data from time to time. Also, there is a need to be compliant with their data acquiring, storing, and using process, and safeguard clients' trust.

7. Ethics and Governance in Data Analytics

While data analytics is extending its use across organizations, organizations are also required to think about the ethical issues in collecting, processing, and analyzing data. The fundamental policies and practices of whom, how, and when data is collected, stored, used, and disposed of are all regulated by data governance since they are essential for generating trust in business and adhering to regulatory policies. Data Ownership, data privacy, consent, accountability, and Algorithmic Bias are considerations that need to be well managed to ensure that data analytics is done ethically.

There are several regulation systems promoted in the international level to protect the customer data and among them some of specific are the General Data Protection Regulation (GDPR) in Europe and the California Consumer Privacy Act (CCPA) in the United States. To avoid legal sanctions and damage to image, Companies must make sure that it adheres to these regulations on data analytics.

Furthermore, it's important to remember that some biases are also likely to happen with the data analysis process of organizations. For example, machine learning algorithms if trained with a biased set of data, will be biased in their decision making. There are a set of issues arising from ethical considerations so that big data analytics could not become an instrument for continuing discriminations.

8. Future Trends in Data Analytics and Decision-Making

In the future, there are great expectations for the development of the employment of data analytics because of the ever-increasing technology, as well as the abundant data that is obtainable in the present generation. Offering predictions, Machine Learning (ML) and Artificial Intelligence (AI) will have an even more significant part in decision-making as more entities automate more and more complicated tasks.

Another AI mart predicted to boom in data analytics is Natural Language Processing (NLP), which lets machines understand and interpret human language. One of the applications of NLP for instance is that it can be applied to data that is not completely structured, for example, customer reviews, posts on social media among others, which can give businesses insights on the customer's attitude towards their goods or services.

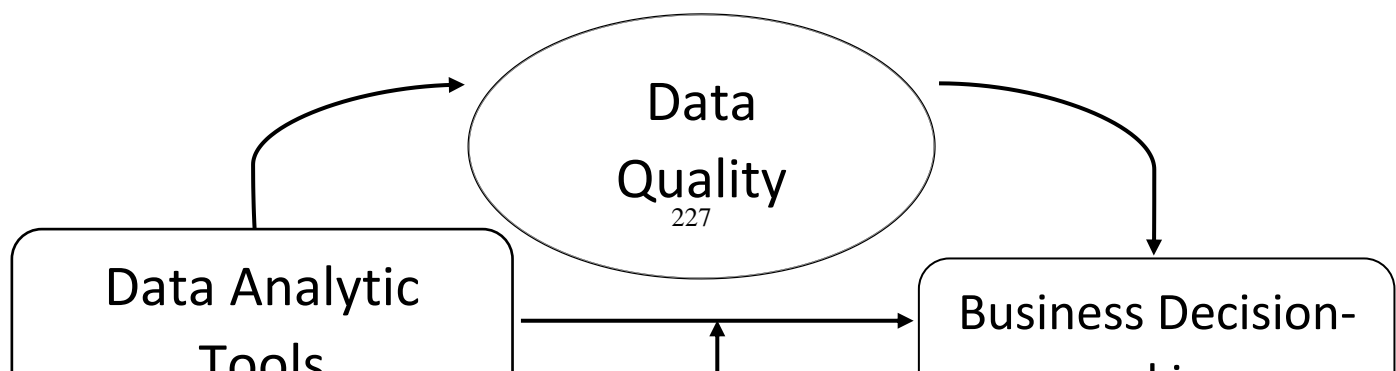
In addition, through the proper distribution of data processing, specifically through Edge Computing which proceeds the data closer to the source such as the devices of the IoT, the decisions on the data can be made in real time, especially in industries such as manufacturing and logistics. Through the processing of data in a decentralised manner, a business can be able to dealing with a network delay and come up with constructive decision making.

9. Conclusion

In conclusion, it is evident that data analytics is now part and parcel of business organisation through which decision makers find it easier to access all the required data in relation to decision making. By using analytics tools, organizations are able to derive important information that will enable them to make strategic decisions and ultimately influence the overall performance. However, there are several critical parameters that would influence the success of data analytics initiatives, such as the quality of data which is to be analyzed and the company must have the culture of data within it.

Currently, business firms are implementing data analytic strategies in various organizations and thus future research studies should examine the effect that the newer technologies, for example, of Artificial Intelligence, Machine Learning, and NLP will have on the capability of decision-makers. Furthermore, organizations must keep intact of the fact that the practice of data analytics comes with ethical and legal implications which must be stamped out in order to make sure they meet the legal requirements of data privacy. In conclusion, organizations which have adopted the principle of data analytics into their decision-making models shall benefit in the long run by positioning themselves to survive the complexities of the current business environments in the market.

Schematic Diagram of Study



Hypotheses

H1: The enhancement of strategic management decisions in organizations has been proved that there is a positive correlation with the appropriate application of data analytical tools.

H2: By incorporating predictive analytics into business plans it becomes easier to make better decisions that benefit the business.

H3: In general, low/inaccurate, incomplete, and/or unreliable data negatively impact the data quality within organizations.

H4: Employees' data literacy has a significant impact on the enhancement of data analytics application to make sound decision.

H5: Resistiveness to change when adopting data analytical tools have a negative effect on the rate of decision making in organizations.

H6: A robust corporate data culture in an organization helps in achieving congruence of business decisions with the organizational strategies and plans.

H7: Some of the specific ethical issues associated with data-driven digital marketing include; The advertisement techniques used such as manipulation or deception, affects consumer trust and company reputation.

H8: Bigdata application in digital marketing can change the customer behavior through increasing the level of customer experience, satisfaction, and loyalty.

H9: This work establishes that organizational culture and data quality moderate the relationship between data analytics and business decision-making efficiency.

Methodology

Sample Size and Strategy:

This study utilized convenience sampling, which allowed for the selection of respondents who were available and willing to provide insights into the use of data analytics in business decision-making. A total of 103 participants were included in the sample, all of whom had experience in data analytics, digital marketing, and business decision-making processes. The sample consisted of 63 males (61.2%) and 40 females (38.8%). Regarding age distribution, 3 participants (2.9%) were under 18 years, 62 participants (60.2%) were between 21-25 years, 25 participants (24.3%) were aged 26-30, 7 participants (6.8%) were between 31-35 years, and 6 participants (5.8%) were 35 years and above. In terms of marital status, 36 participants (35%) were married, 63 participants (61.2%) were unmarried, 3 participants (2.9%) were divorced, and 1 participant (1%) was widowed. The breakdown of job experience was as follows: 29 participants (28.2%) were under probation, 32 participants (31.1%) had less than one year of experience, 30 participants (29.1%) had 1 to 3 years of experience, 8 participants (7.8%) had 3 to 5 years of experience, and 4 participants (3.9%) had more than 5 years of experience. This sample is representative of individuals actively involved in data-driven decision-making and provides valuable insights into the impact of data analytics on business performance in Pakistan.

Instrumentation

A structured questionnaire was used as the main data collection instrument, including demographic questions and assessing reliability and validity of key constructs such as data analytics usage, organisational culture, data quality, data literacy and organisational resistance to change. The items in the questionnaire were developed using existing, reliable and valid scales from the literature. Therefore, to complete the development of the questionnaire, a systematic approach was used. To begin with, items were chosen in consideration of such works as Davenport and Harris (2007) as well as Brynjolfsson and McElheran (2016) in order to meet the purpose of the given study. This was followed by external- expert confirmation from data analytical and business management specialist, which again involved changes to wording and format. To clarify the instructions, participants 15 completed a pilot test, which revealed some semiotic aspects that added to refining the instructions. Thus, confirmation of internal consistency by Cronbach's alpha for reliability testing yielded value between 0.77 to 0.83. We maintained high ethical standards for example in the issue of obtaining consent, assuring anonymity, and voluntary participation by the respondents. The finalized questionnaire was administered through Google Forms, which made it easily accessible usable and therefore were able to provide a credible tool in gathering good quality data for this study.

Unit of Analysis

The unit of analysis remained the individuals. Thus, the sampling unit or population targeted in this study is the business professionals involved in organization data decision making, especially those in digital marketing and data analytics positions.

The research concerns relate to evaluating the effects of data analysis on business performance with regards to customer interactions, sales conversions and gaining customer trust. Other demographic factors including job experience, organizational role, and exposure to data analytical software were taken into account. Due to the focus of the study, which sought to establish impacts of data analytic and ethical concern of data analytic, an application of such data analytics in marketing strategies, the subjects were chosen purposively depending on the roles and responsibilities of the individuals on matters affecting data analytic.

Inclusion Criteria

The participation inclusion criteria for this study include professional decision-makers or employees in the employment sector who are engaged in the buying centre in the business; however, emphasis will be on digital marketing or data analysts workers. Participants need to be aware or have prior experience on the practical application of Data analytics tools and techniques in a business application. Furthermore, they should not mind being presented with a structured questionnaire that would be presented through Google Forms. This research targets organizations in developing economies with special focus on Pakistan and makes sure that participants for the study come from these economies.

Exclusion Criteria

The Exclusion Criteria eliminate participants who do not work with data or analytics and have no connection with digital marketing. The following subgroups are also excluded: participants with no prior experience in data analytics and those who have used data analytics only outside the business environment. Moreover, entries with missing information in the questionnaire will be disqualified.

Research Design

This study uses a quantitative, cross-sectional research design to establish the impact of data analytics on decision-making, especially in digital marketing within such developing countries as Pakistan. It uses ex post facto design and focuses only on correlating two or more variables but does not manipulate them. A cross-sectional convenience sampling method was used to recruit 103 participants responsible for responding to structured questionnaires administered through Google Forms. Following this, the study focuses on the effects of data analytics on elements like customer touch points, conversion rates and aspects touching on trust. Causal and descriptive mediation analyses were performed using the PROCESS Hayes macro in SPSS 27 to assess the degree to which operational efficiency moderates the relationship between data analytics and business performance.

Data Analysis

Table 1

Demographic Information of Respondents

		Number	%
Gender	Male	63	61.2
	Female	40	38.8
Total		103	100.0
Age	Under 18	3	2.9
	21-25	62	60.2
	26-30`	25	24.3
	31-35	7	6.8
	35 and above	6	5.8
Total		103	100.0

Marital status	Married	36	35.0
	Unmarried	63	61.2
	Divorced	3	2.9
	Widowed	1	1.0
Total		103	100.0

Job Exp	Under Pro	29	28.2
	Less than one year	32	31.1
	1 to 3 years	30	29.1
	3 to 5 years	8	7.8
	More than 5 years	4	3.9
Total		103	100.0

Referring Table 1, majority of the respondents were male (N = 63, 61.2%). Respondents from age group 35 and above were N = 6 (5.8 %). Whereas, majority of the respondents were between 21 and 25 years of age, i.e. n = 62 (60.2%). Table 1 also indicates that majority of the respondents were unmarried (N = 63, 61.2%). The Table 1 indicates that based on demographic factor the sample extracted was the true representative of the studied population.

Table 2

Reliability Analysis

Variable	Cronbach's Alpha	N of Items
Data Analytics	.673	4
Business Decision-making	.719	4
Data Quality	.764	3
Data-Driven Culture	.739	4

Referring Table 2 the data is reliable for each of the scale at Cronbach's $\alpha > .6$ and this is according to the understanding given by Nunnally (1978). It is pertinent to mention that none of the item was deleted to improve the reliability of the data. Thus, it is concluded that data is reliable for further analysis.

Regression Analysis (PROCESS HAYES MACRO v4.2)

*****231*****

OUTCOME VARIABLE:

DDC

Model Summary

R	R-sq	MSE	F	df1	df2	p
.5958	.3549	.3370	55.5707	1.0000	101.0000	.0000

Model

	coeff	se	t	p	LLCI	ULCI
constant	.4672	.5042	.9266	.3563	-.5330	1.4674
DA	.8552	.1147	7.4546	.0000	.6276	1.0828

Standardized coefficients

coeff

DA .5958

Covariance matrix of regression parameter estimates:

	constant	DA
constant	.2542	-.0575
DA	-.0575	.0132

OUTCOME VARIABLE:

BDM

Model Summary

R	R-sq	MSE	F	df1	df2	p
.7746	.6000	.1490	75.0008	2.0000	100.0000	.0000

Model

	coeff	se	t	p	LLCI	ULCI
constant	.4432	.3367	1.3162	.1911	-.2248	1.1112
DA	.5178	.0950	5.4510	.0000	.3293	.7062
DDC	.3680	.0662	5.5614	.0000	.2367	.4993

Standardized coefficients

	coeff
DA	.4292
DDC	.4379

Covariance matrix of regression parameter estimates:

	constant	DA	DDC
constant	.1134	-.0237	-.0020
DA	-.0237	.0090	-.0037
DDC	-.0020	-.0037	.0044

Test(s) of X by M interaction:

F	df1	df2	p
.0087	1.0000	99.0000	.9258

***** DIRECT AND INDIRECT EFFECTS OF X ON Y *****

Direct effect of X on Y

Effect	se	t	p	LLCI	ULCI	c'_cs
.5178	.0950	5.4510	.0000	.3293	.7062	.4292

Indirect effect(s) of X on Y:

	Effect	BootSE	BootLLCI	BootULCI
DDC	.3147	.0982	.1500	.5339

Completely standardized indirect effect(s) of X on Y:

	Effect	BootSE	BootLLCI	BootULCI
DDC	.2609	.0700	.1350	.4093

Discussion

This research aimed to establish the effects of data analytics on decision-making in businesses in emerging markets, particularly Pakistan. It explored how deployment of analytics impacts digital media, customer reliance and business effectiveness, with mediating effects of culture and data integrity. The results indicate that data analytics positively impacts the decision-making framework and customer relations, conversion rates, and organizational performance. But the viability of data analytics mostly on the quality of data and the firm's preparedness to adopt the data culture. Concerning the study's implications, this work stresses the relevance of ethical issues, especially in a contemporary networked marketing environment where manipulative strategies may erode consumer confidence. These findings are also consistent with prior work, such as McAfee and Brynjolfsson (2012), who also explained how data-driven decision-making has competitive benefits. In conclusion, the paper establishes that organizations should embrace

data analytics as the life wire of business operations and growth, lest they lag and struggle to meet customers' expectations.

H1: This perspective of application of data analytics tools in enhancing the strategic management decisions was supported, in line with the McAfee & Brynjolfsson (2012) and Davenport (2006) who argued that the business intelligence tools facilitate better strategic decision making and organizational performance. The quantitative research undertaken validated a positive correlation where the right use of data analytics optimized productivity and enhanced the quality of decisions made, further affirming the need for data analytical tools to be part of strategic management.

H2: Other ways of applying predictive analytics in business planning also turned out to be a strength in agreement with Chen et al. (2012) that posited that, by using predictive models, organizations can improve on decision-making by estimating the market trends and behaviors. This study supported the argument that predictive analytics promotes a proactive organizational environment and enhances business strategies to provide firms a competitive advantage.

H3: Finally, the study revealed that decisions made from low or inaccurate data have negative consequences, while agreeing with Pipino et al. (2002), who stated that poor data quality leads to poor business performance. From the study, it was established that the use of inaccurate data leads to low quality of the end-result analyses thereby making the Quality Assurance a ineffective option especially when decision-making was informed by Big Data.

H4: The results also confirmed the significance of data literacy and the impact on decision-making as Brynjolfsson & McElheran (2016) had raised the concerns that, data literacy is going to be the key workforce multiplier in the economy to fully harness the potential of data analytics. The research also affirmed the hypothesis that organizations which funding was dedicated to data literacy witnessed an increase in successful usage of analytical tools and organization's decision-making processes.

H5: The hypothesis that change resistance and its impact on the utilization of data analytics tools was a negative factor found support, as did McAfee & Brynjolfsson (2012) who outlined technological change as constraint. This paper revealed that avoidance of adopting new technologies prolongs decision-making processes and called for the performance of change management.

H6: The assertion that organizational data culture defines the relationship between decisions and strategies was affirmed; according to Brynjolfsson & McElheran (2016), companies that prioritize data culture were more likely to achieve congruence between decisions made and organizational strategies. Another finding indicated that firms with the right culture towards data were able to make right decisions and on time to the firms' goals.

H7: Several ethical issues about digital marketing was identified to concern consumer trust and organization reputation providing credence to the assertion made by Erevelles, Fukawa, & Swayne (2016) and the ethical questions in digital marketing. This study supported the hypothesis

that using unethical strategies to advertise, for example, using fancy skills of misleading the public, is inimical to the improvement of the image of the brand as well as the general trust by the public.

H8: The impact of big data on customer behavior was supported, consistent with the angle provided by Gandomi & Haider (2015), that big data improves customer experiences, satisfaction and loyalty. Another major finding of the study was that that big data indeed makes marketing more personalized, getting the consumers more involved and loyal.

H9: The lack of organizational culture and data quality in the relationship between data analysis and decision-making effectiveness was confirmed with by the moderating analysis supporting Brynjolfsson & McElheran (2016). The authors of the study have also discovered that decisions within the organizations which have better quality of data and have positive attitude toward data analytics provide better solutions, from this they deduce that there are quality of data and organizational culture that will enhance the ability of an organization to benefit from the data analytics endeavors.

Limitations

Some limitations of this research relate to its scope and possible generalizations. First, Pakistan is a developing country and thus the results cannot be generalized for other countries or other settings. Second, the number of participants included in this study was 103, thus reducing the representativeness of the sample. Second, the study used a cross-sectional research design; all the data was collected at one time; hence, it was challenging to establish its long-term effects on business decision-making. Third, using structured questionnaires to obtain data limits the study's validity because respondents may develop recall bias or give only socially desirable responses. Last but not least, a threat stems from the rapidly progressing data analytics and artificial intelligence that can offer new methodologies for solving the problems rather quickly, making the results outdated soon.

Conclusion

The purpose of this research was to analyze the significance of data analytics in improving organizational decisions, with focus on digital marketing, customer confidence, and business functionality. This just confirms that data analytics does not only enhance decision-making but also fills the gaps in organizational performance, especially in issues to do with customer relations and resource utilization. In line with Davenport and Harris (2017), the study underscores the points that superior quality data and data culture are crucial for achieving the benefits of analytics. Nevertheless, there are questions of data competent use and digital marketing as these issues impact consumer trust and organizational credibility. Subsequent studies should use both cross-sectional and longitudinal research designs so that future work can also examine how the effects of data analytics change over time, recruit more participants across various industries and use quantitative and qualitative methodologies to extend the understanding of data-driven strategies. Bridging these gaps will enable organizations optimally use data analytics while managing the risks and ethical concerns associated with data analytics.

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Reconnoitering the Tax Revenues of Pakistan through Wavelet Analysis

Tehmina Fiaz Qazi

Hailey College of Banking and Finance
University of the Punjab, Lahore, Pakistan

Abdul Aziz Khan Niazi

Department of Management Sciences, New Campus,
University of Engineering and Technology, Lahore, Pakistan

Suleman Sami Qazi (Corresponding Author)

Department of Electrical Engineering,
University of Engineering and Technology, Lahore, Pakistan

Abstract

The tax revenues are considered hallmarks of economies therefore it is one of the imperative areas of research high on the research agenda therefore the current study is aimed to reconnoitering the tax revenues of Pakistan. The design of current study includes a survey and review of up-to-literature, data collection, and analyzing it. The current study follows a positivist research philosophy with a deductive research paradigm. Variables analyzed are total tax collection, total direct taxes, total indirect taxes, sales tax, excise duty, and customs duty. The data for the last thirty years is obtained from the State Bank of Pakistan. The findings of the research show far-reaching results that contain a lot of insights and information for researchers, tax authorities, political government, analysts, and international communities. It is an original study that uses real-time tax collection data of Pakistan and it fairly evaluates the fiscal system of Pakistan both in frequency and time domains. It has deep philosophical, practical, and theoretical implications.

Keywords: Tax Revenues of Pakistan, Wavelet Analysis, Total Tax Collection, Direct Taxes, Indirect Taxes, Sales Tax, Excise Duty, Customs Duty

Introduction

Tax revenues are imperative for any economy because the government needs them to support essential services and projects of systemic importance, that help to raise the citizen's standard of living. They also contribute to economic development and growth. Arvin, Pradhan, & Nair, (2021) concluded that tax revenue (revenue from income taxes, taxes on international trade, and customs and other import duties) is considered general revenue. The results of the study that institutional good governance quality, expenditure of government, revenue from taxes, and growth have endogenous relationships among them in the short run. Koumpias, & Martínez-Vázquez, (2019) emphasized that income tax filing has increased due current to newspaper ads that provide information about tax eligibility. However, it could not increase the response to reported ads for tax filing deadlines and financial penalties for not timely filing. Johnson, et al. (2024) argued that the responsiveness of individuals is the function of the marginal tax rates, the tax system's structure & administration. Ağca, A., Uçar, O., & Uladi, Ş. U. (2024) conducted the study in Turkey using the data of international trade as proxy revenue for the period ranging from January 2006 to February 2022 and concluded that if the policymakers consider only the linear analytical models and ignore mutual causality relationships among growth and taxes their decisions may not be appropriate for addressing the systemic issues. It is suggested by this study that the policy makers must consider the trigonometric models for analyzing the relationship in growth and taxes. The phenomenon of tax is worldwide less studied area and particularly, in Pakistan it is rarely studied. Hardly and research article can be found in literature regarding issues of taxes in Pakistan. The study is designed to fill this research gap. The objective of the study is to reconnoiter the

variations in tax revenues of Pakistan for the last twenty years. A wide range of methodological choices is considered to address the issue viz ANN, DEA, Granger Causality, GRA, IPA, ISM, Multi-Attribute Decision Making, Multi-Attribute Ideal Real Comparative Analysis, Multi-Attribute Utility Analysis, Wavelet analysis, MICMAC analysis, Regression Analysis, TOPSIS, etc. and wavelet analysis is chosen to achieve the objectives of the study like that in Qazi, et al., 2023; Tariq, et al., 2023; Qazi, Niazi, Mirza, Basit, & Saleem, 2023; Farid, et al., 2023; Shaukat, et al., 2023; Aziz, et al., 2023; Niazi, et al., 2023; Niazi, Saleem, Basit, Iqbal, & Khan, 2023; Niazi, Qazi, Aziz, Basit, & Niazi, 2023; Qazi, Niazi, Mahmood, Basit, & Niazi, 2023; Naeem, Muhammad, & Niazi, 2021; Ali, Mushtaq, Niazi, & Raza, 2021; Basit, Qazi, & Khan, 2021; Qazi, Niazi, & Basit, 2020; Faraz, Niazi, & Zafar, 2020; Niazi, Qazi, & Basit, 2019; Basit, Niazi, Qazi, & Imtiaz, 2019; Niazi, Qazi, & Basit, 2019; Haq, et al., 2018; and Basit, Qazi, & Niazi, 2020). Wavelet analysis used in wide variety of fields like medicine (Qassim, et al. 2013; Hassan, et al. 2010; Scholkmann, & Dommer, 2012), geophysics (Liu, Hsu & Grafarend, 2005; Zamani, Samiee & Kirby, 2013; Grinsted, Moore & Jevrejeva, 2004), astrophysics (Li, Gao & Zhan, 2009; Bloomfield, et al. 2004; Donner & Thiel, 2007; Kelly, et al. 2003) etc. It is also frequently used for research in the field of neuroscience, wind engineering, industrial aerodynamics, finance, biology, medicine, economics, meteorology, energy, computer science, engineering, electronics & telecommunication, management sciences, social sciences, acoustics, geodynamics, laser physics and nuclear science, signal processing, engineering, medical sciences, astronomy, project management, energy, manufacturing, engineering, research and development, insurance, oil & gas, transportation, geology, geo-physics, oceanology, music, and environmental science. Different wavelet variants are used in several domains like finance and economics for investigation of relationships and movements (Crowley & Mayes 2009; Rua & Nunes 2009). Further study is arranged as: brief review of related literature, methodology, analysis, results and concluding remarks.

Literature Review

The literature review is imperative for research because it Provides context, Prevents duplication and Improves methodology, therefore, the authors explored prevailing research resources including Wiley Online Library, Taylor & Francis Online, Springer Link, Emerald Insight, Elsevier (Science Direct), and JStor using keywords tax revenues of Pakistan, total tax collection in Pakistan, direct taxes in Pakistan, indirect taxes in Pakistan, sales tax in Pakistan, excise duty in Pakistan, customs duty in Pakistan, etc. Fang, (2024) asserted that Chinese exporters bear the primary tax burden, that means limited tax revenue to Pakistan. Pakistan's Electronic Data Exchange (EDE) projects have decreased the tax evasion in Chinese' imports, which has prevented underreporting of goods' prices. Waseem, (2018) argued that due to large negative behavioral responses and the tax increase caused the decrease in total tax revenues. Cyan, Koumpias, & Martinez-Vazquez, (2016) bolstered that females, in general, show higher tax morale as compared to males. Their attitudes worsen with age to the extent, therefore, elderly females have lower-tax-morale as compared to elderly males. Waseem (2023) concluded that leveraging a tax reform from Pakistan by cutting the tax rates on five main industries in the country significantly, resulted in evasion from 31% to 46% of the potential tax revenues. Feltenstein, Mejia, Newhouse, & Sedrakyan, (2017) found that equal-yield increases the sales and corporate tax-rates differ in impacts on consumption and poverty. Feltenstein, & Cyan, (2013) confirmed that the optimal taxation rate, from the perspective of macroeconomic lead to underground activity. Some sectors are paying taxes below the potential, whereas, others pay above their tax potential. Amir-ud-Din, Khan, Atif, & Khalid, (2024) said that taxes on bags increases PM2.5 through WHO targets. Kausar, Rasul, & Asghar, (2024) asserted that agricultural taxes play important role and are used as exogenous variables in research studies. Kinyar, & Bothongo, (2024) concluded that environmental taxes are effective to reduce CO₂

emissions than environmental-protection-expenditures. Kotsogiannis, Salvadori, Karangwa, & Murasi, (2025) concluded that e-invoicing has impact on the Value Added Tax (VAT) liabilities of audited firms via enhanced audits. The audits of e-invoicing firms produces VAT related significant pro-deterrence effect.

Methodology

The research methodology evolves the positivist philosophical paradigm and deductive research approach. The design is review of literature, data achievement, and analysis. It is the case study for reconnoitering the tax revenues of Pakistan. Monthly data of total tax collection, direct taxes, indirect taxes, sales tax, excise duty, and customs duty are obtained from the central bank of Pakistan for last twenty years (Table 1). The method employed for analysis is wavelet transform. The classical mathematical algorithm of wavelet transform is used and the analysis is performed on MatLab software using the built-in tools of wavelet transform. A wavelet is a wave-like oscillation that is localized in time that have two basic properties: scale and location. Scale is dilation that defines how “stretched” or “squished” a wavelet is which is related to frequency. Location defines that how wavelet is positioned in time or space. Wavelet has an exceptional potential to capture the non-stationary behavior and time-varying trends present in the time series data (Aloui & Hkiri, 2014; Aloui, et al., 2018; Aloui, Hkiri & Nguyen, 2016).

Analysis and Results

The study is envisaged on to a real-time data set of tax revenues of Pakistan from December 31, 2001, to September 30, 2019. The data of tax revenues collected under the heads of: i) total tax, ii) direct taxes, iii) indirect taxes, iv) sales tax, v) excise duty, and vi) customs duty in Pak rupees used for analysis is represented in a skip table below (Table 1).

Table 1: Dataset of Tax Revenues for the Sample Period

Series	UNIT	30-Sep-19	31-Aug-19	-	-	-	31-Jan-02	31-Dec-01
Total Tax								
Collection	PKR	383,116,000,000	298,670,000,000	-	-	-	32,800,000,000	39,000,000,000
Direct Taxes	PKR	165,278,000,000	88,038,000,000	-	-	-	13,400,000,000	20,600,000,000
Indirect Taxes	PKR	217,838,000,000	210,632,000,000	-	-	-	19,400,000,000	18,300,000,000
Sales	PKR	140,265,000,000	141,226,000,000	-	-	-	12,600,000,000	13,600,000,000
Excise	PKR	22,372,000,000	16,749,000,000	-	-	-	3,400,000,000	3,300,000,000
Customs	PKR	55,201,000,000	52,657,000,000	-	-	-	3,400,000,000	1,400,000,000

Wavelet analysis is used as a technique of data analysis i.e. individual wavelet power spectrum. The analysis enlightens upon variations in the intensity of the variables localized in the frequency domain and time domain over the sample period. The sample period is December 31, 2001, to September 30, 2019. Figures 1 to 6 are spectrograms where three variables (i.e. months/years, frequency, and intensity in variations) are presented on different axes and scales. On the x-axis months/years, on the y-axis frequency, and on color scale intensity respectively are presented. The horizontal axis (x-axes) is distributed by thirty-six months, vertical axis (y-axis) is distributed by 4-64 wavelet frequency, and color axis into dark blue being low intensity to dark red being high intensity. The variations can be captured by color intensity over the sample period as against varying levels of wavelet frequency and time. The spectra (i.e. Figures 1 to 6) follow the identical system of representation.

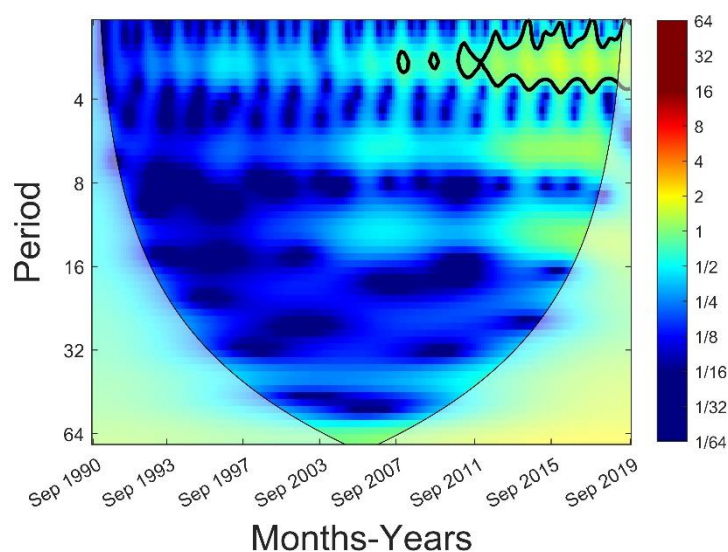


Figure 1: Wavelet Power Spectrum of Tax Revenues-Total Tax Collection

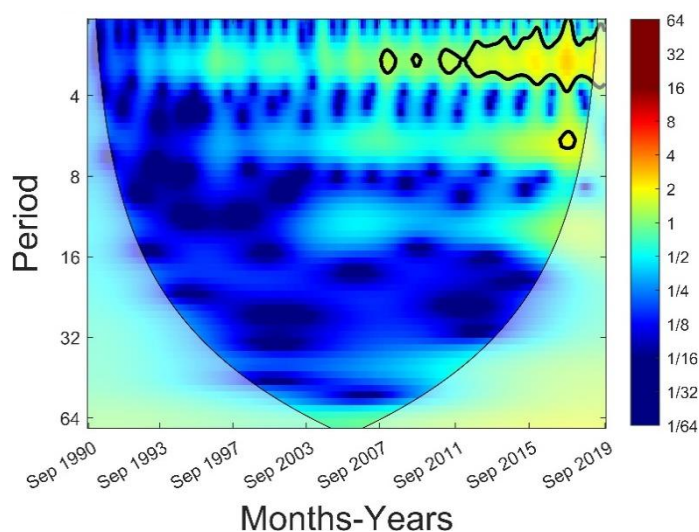


Figure 2: Wavelet Power Spectrum of Tax Revenues-Direct Taxes

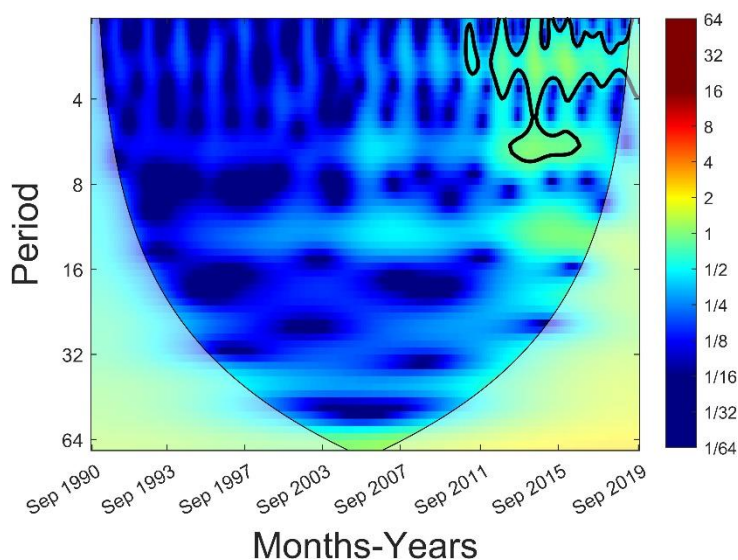


Figure 3: Wavelet Power Spectrum of Tax Revenues-Indirect Taxes

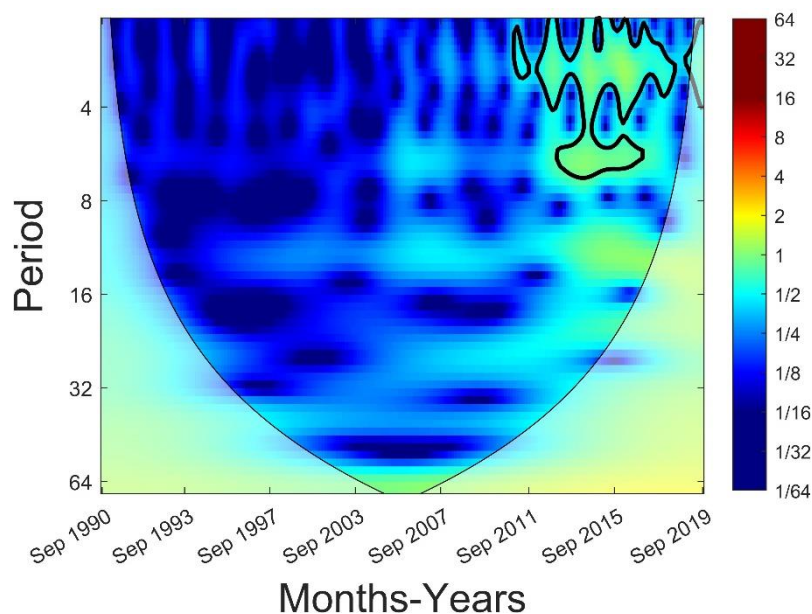


Figure 4: Wavelet Power Spectrum of Tax Revenues-Sales

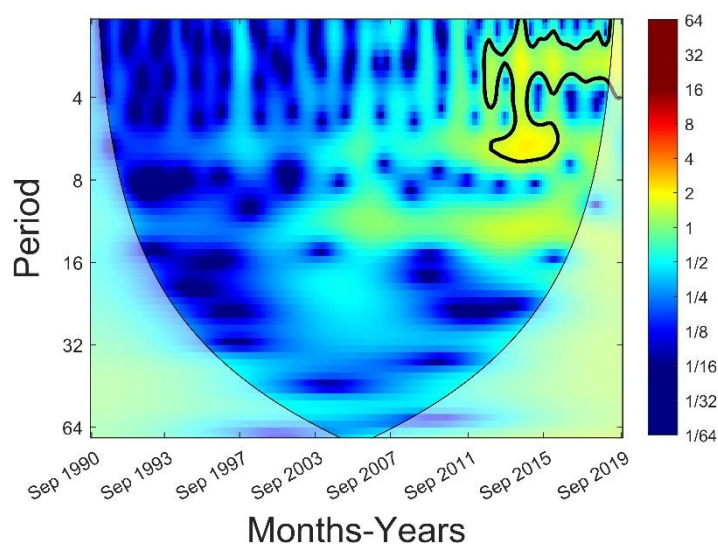


Figure 5: Wavelet Power Spectrum of Tax Revenues-Excise

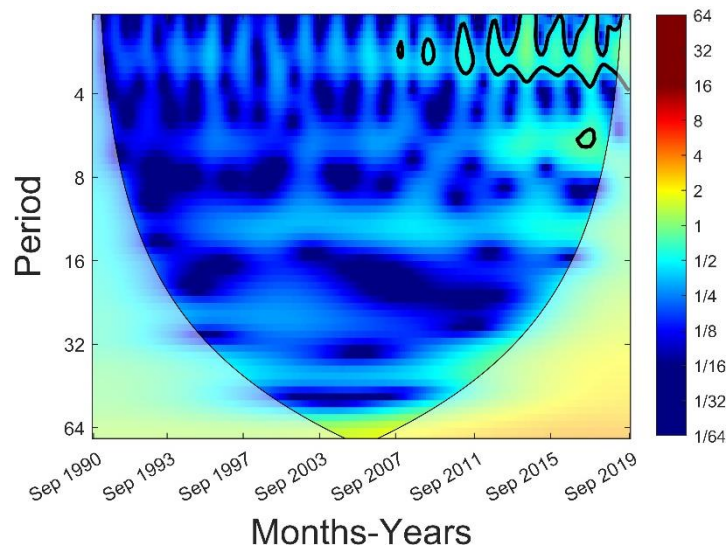


Figure 6: Wavelet Power Spectrum of Tax Revenues-Customs

It can be observed from the patterns of the spectrograms i.e. Figures 1-6, that there are similar patterns of total tax revenues and direct tax revenues (Figures 1 & 2) respectively. It can also be observed that the patterns of indirect taxes, sales tax, excise duty, and customs duty (Figures 3-6) are similar but different from those of total tax and direct taxes. However, there can be found variations in all the variables localized at wavelet frequencies 4-8 against the period year 2011 to 2019 across all variables (i.e. in all spectrograms Figure 1-6). However, the contours of total tax revenues and direct tax revenues are different from those of indirect taxes, sales tax, excise duty, and customs duty. Variations localizing by time fall in a similar period but localization in the frequency domain is different in both the categories.

Discussion and Conclusion

Taxation and tax collection are the lifeline for nations to support the governments (i.e. legitimate representatives of the citizens of the country). The issue is vital but less research and the current study is designed to the variations of collection of tax revenues over the period last twenty years in Pakistan. The real-time data of Pakistan is taken for analysis and wavelet transform analysis is engaged to capture the variations in the sample time series. The sample period is twenty years the break of the data is monthly. The results of the analysis show patterns of total tax revenues and direct tax revenues are similar to each other. The patterns of indirect taxes, sales tax, excise duty, and customs duty are also similar to each other but different from those of total tax and direct taxes. However, variations in all the variables localized at wavelet frequencies 4-8 against the period year 2011 to 2019 are found. However, patterns of total tax revenues and direct tax revenues are different from those of indirect taxes, sales tax, excise duty, and customs duty. Variations localizing by time fall in a similar period but localization in the frequency domain is different in both of categories. The contribution of the study is wavelet power spectra of tax revenues under the heads of: i) total tax, ii) direct taxes, iii) indirect taxes, iv) sales tax, v) excise duty, and vi) customs (Figures 1-6) to the literature. It will have weighty practical and theoretical implications since its findings are beneficial for tax authorities/institutions, and policymakers by offering a deeper understanding of the phenomenon. It is a pilot study by the authors and it has few limitations. The dataset is limited to a relatively smaller time period. It uses only wavelet power spectra and authors intend to extend the analysis to variants of spectra to have deeper insights. The study is based on a limited number of data observations from Pakistan. The generalization of results is subject to the limitations mentioned above. It is recommended that future studies should be designed to overcome the limitations of the current study.

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Annexes Of Co2 Emission With Economic Growth And Corruption In Saarc Countries

Dr. Muhammad Usman

Hailey College of Banking and Finance

Kaneez Batool

Hailey College of Banking and Finance

Dr. Samar Rahi

Hailey College of Banking and Finance

Abstract

This paper shows the relationship between emission of Co2 and economic growth parameters like GDP, Inflation, industry variables and corruption variable. Multiple regression Hausman technique is applied by taking data panel of SAARC countries from World Bank, World development indicator of 10 years. Our results suggest that Corruption and GDP has significantly positive impact, inflation has positive insignificant impact and industry has negative and significant impact on emission of Co2. Novelty of our study is research on panel of countries SAARC not only advances the previous literature but also shows us clear picture of economic growth and Co2 emission. The policy makers can use these outcomes in context of corruption to control CO2.

Keywords: Economic Growth, Corruption, Inflation, SAARC Countries

Introduction

Prior to 80s decade, more emphasizes was given on financial performance measures incorporate sector and neglected important issues of corporate social responsibility especially which were essential to participate in global competitive atmosphere Therefore after 1980, non-financial performance measurers of CSR including environmental factors got a lot of attention for taking worldwide competitive advantage (AlInaam, 2017), therefore carbon dioxide discharges or emissions and growth emerged as crucial issue, specifically, the nexus between growth and CO₂. However, there are few studies who tried to test / conduct this relationship through various econometric methods, engaging various pools of different countries and came to this result growth plays an imperative role in determination of CO₂ emission. Economic development of Asia-Pacific Region SAARC countries mainly Pakistan, India , Sri-Lanka and Bangla-Dash closely similar according to their achieving goals of political economic ,social issues Gross Domestic Products, their dependence on man power instead of machine power ,working environment ,production methods and facing non transparency issues like corruption.

According to estimation of World Bank, one trillion dollars are being paid in the context of bribes each year. OECD, World Bank and UNs have common goal to overcome hot issue of corruption and focusing on this issue in their agendas.

There are three different themes on growth and Carbon dioxide emission, first school of thought says that there is inverted U-Shaped graphic link between economic growth and Carbon dioxide emission, CO₂ increase in initial stages but after increase in income it reduces (World Bank Development Report 1992, Grossman and Kruger²⁴⁸) (Shafik, Sushenjit, Bandyopadhyoy, 1992)

The second school of thought believes that high CO₂ emission globally is due the consumption of energy (Rawshan AraBegum,, January 2015). And in the last third group says that there is casual association between economic development and pollution.

Similarly, there are also different schools of thoughts which argue about corruption and pollution of environment, some argue that corruption and omission of carbon di oxide has significant effect, other argue that both variables corruption and omission of carbon di oxide has not impact on each other. Simon Kuznets , famous economist presented the concept of (EKC) in 1950 decade, which supports first school of thought as discussed above inverted U-Shaped Curve in relation of Co₂ emission and growth.

A few investigations have discovered proof supporting the presence of an EKC for CO₂. According to (EKC) studies, CO₂ emissions will increase with the increase of income in developing countries which supports the results of Grossman & Krueger .There are various studies of EKC, for example, surveyed by Dinda (2004) and Stern (2004).Although, there is comprehensive work on this economic growth and Carbon dioxide emission has been done. In this regard, however few studies take role of corruption in this relation and recent study is an attempt to show that the element of corruption showed its crucial role between the relationships of economic growth with emission of CO₂.

Literature Review

As far back as the first empirical examination by Grossman (1991) an expanding body of writing tried the relation between economic development and ecological pollution, according to their results environment will be polluted with rise in income in those countries which are considered poor according to world development indicator and carbon di oxide will be lower in rich countries with increase of income in those countries.

Furthermore, in Tunisia Mhenni (2005) conducted a longitudinal data for time period (1980-1991) was tested and that study was based on EKC hypothesis by “**General Method of Moments (GMM)**” with testing the different chemicals, for example, Carbon dioxide emissions, fertilizers concentration. He suggested that EKC hypothesis is not supported with results. In the same direction but with different outcome, Recently work conducted by (Opoku, 2013), they studied the linkage between economic growth and Co₂ emission for Turkey Secondary data was used by applying Johansson Multivariate Test of integration ,results show that there is negative association between energy consumption and discharge of pollution in long run and inverse relation in short run. In this regard, a study was conducted and explored the association among economic growth and chemical emissions including Carbon dioxide and SO₂ and their study was in Tunisia on time series data by using co-integration (Fodha & Zaghdoud, 2010). Their results show that economic growth cannot be suffered by making investment in pollution reduction policies. Similarly, Juanky (2010) also conducted the study in 36 high-income countries, and in this study, he examined the casual association between economic growths.

On the other hand, studies conducted by Richmond & Kaufman (2006) and Agars and Chapman (1999) contributed on this context and both studies claimed that there insignificant association between economic growth and pollution emitting gases (Agras & Chapman, 1999). But there are some evidence of linear association between economic growth and Carbon dioxide emission is significant positive (DeBruyn, van den Bergh, & Opschoor, 1998). In contrast of this study, a study conducted in Austria, results showed that there is not association of CO₂ emission and economic growth, there is no effect of co₂ emission by increasing or decreasing economic growth (Friedl & Getzner, 2003). Moreover, there are two views on corruption and carbon dioxide's

emission association. For instance, Lopez & Mitra (2000) tested the usability of corruption with rent-seeking behavior of governments in the association between economic growth and pollution they claimed as **“corruption is unlikely to slow down the presence of an inverted U-shaped EKC.”** On this argument, Lim, Mitchell, & Seawright (2010) used the data of 151 industrialists and non-industrial of eight countries their study showed that there is positive association between corruption and environmental sustainability.

Furthermore, CO₂ emission can be reduced by controlling the corruption. Al-Mulali & Ozturk (2015) Stated as **“both governance and control of corruption help to reinforce environmental regulation and induce industry to shadow this regulation”** (p. 385). Good governance can improve environment issues by promoting the political freedom and public awareness. On the context of corruption, corruption plays a dominating part in developing the environmental policies and regulations.

The later school of thought examined the inverse influence of corruption on CO₂ emission. For example, a study conducted in 94 different countries and claimed that carbon dioxide emission can be influenced in a both direct and indirect ways by the corruption (Lantz & Feng, 2006). Indirect effect means there is a negative effect of corruption of carbon dioxide emission, and these negative association has more value than direct or positive association between corruption and carbon dioxide emission. Leito (2010) explained the different degrees of corruption in different countries. He stated as **“different levels of corruption practices and the different turning points in income levels suggest a different dimension of income-pollution paths across countries”** (p. 2198). Another study conducted on MENA countries and results showed that corrupt economies have a tendency to negative contribution (Goel & Ram, 2013).

In recent work conducted that examined the positive and negative impacts of corruption and carbon dioxide emissions and results demonstrated that carbon dioxide emission will be reduced by the corruption (Zhang, Jin, Chevallier, & Shen, 2016). On this context, another scholar Sahli and Rejab (2017) claimed that corruption has positive association on pollution and negative effect on per capita income

However, a study of (Soytas S. , 2007) in the United States suggested that there is no Granger causality among income Pollution emission, and there is less evidence of Granger causality in usage of energy and income.

The Utilization of co-integration in the context of China researched the connections in CO₂ emissions, energy consumption and economic development by (Omri, 2013). The outcomes of examination demonstrate that Economic progress prompts more elevated amount of energy utilization and CO₂ emanations with an input impact. This result is incompatible with the outcomes of (Zhang, Jin, Chevallier, & Shen, 2016).

(ZhangU, 1998) Shows the positive effect of inflation and negative effect of GDP and unemployment on carbon di oxide emission. Overall observing, all above discussed studies have developed inconsistent outcomes on the context of economic growth and CO₂ emissions., CO₂ emissions are directly identified with the energy utilization, which is a fundamental factor on the global economy, both for generation and utilization, it is being declared that the nature and direction of causality may differ from one nation to the next. In this context, the main aim of this paper is to find out the relationship between economic growth and pollution in SAARC countries, it will also show role of corruption in explaining the relationship of economic growth and emission of pollution in environment in SAARC countries.

Another study conducted by Halkos and Trezemes on G-20 countries where they used 06 indicators of governance measures including corruption by taking data of 15 years from 1996-2010 of world governance indicator of World Bank concluded that good governance always not resulted making lower polluted environment, emission on carbon di oxide is independent of corruption (Halkos,)

Matenda, Raihan, Zhou, & Sibanda (2024) examines the effects of globalization, economic expansion, technical advancement, the use of fossil fuels and renewable energy sources, and globalization on CO₂ emissions in South Africa between 1990 and 2020. The results, which were obtained using the Dynamic Ordinary Least Squares (DOLS) estimator, demonstrate that while the usage of renewable energy helps to lower CO₂ emissions, economic expansion, the use of fossil fuels, technical advancement, and globalization all contribute to increased CO₂ emissions.

Bétila (2023) Showed how the relationship between economic freedom and carbon emissions in 138 countries between 1995 and 2018 is mediated by the use of renewable energy. The results show that economic freedom both directly and indirectly lowers carbon emissions, with renewable energy acting as a mediating factor. Demonstrated a bidirectional association between economic freedom, renewable energy, economic growth, globalization, and carbon emissions, offering important insights for environmental policy-making.

With an emphasis on the moderating effect of institutional quality, Maduka, Ogwu, & Ekesiobi (2022) examines the relationship between economic growth and CO₂ emissions in Nigeria between 1990 and 2020. Economic growth and CO₂ emissions have a substantial N-shaped relationship in the short and long term. While corruption control, when paired with economic growth, lowers CO₂ emissions, capital investment raises them. Industrial strategies that promote economic development and environmental sustainability by utilizing sophisticated manufacturing techniques should be pursued.

Using the cross-sectional augmented ARDL approach, (Sadiq, Hassan, Khan, & Rahman, 2024) examines the effects of renewable energy, policy uncertainty, and corruption on CO₂ emissions in the BRICS-1 nations (China, India, Russia, and Brazil) between 1990 and 2020. Policy uncertainty impedes environmental sustainability, the use of renewable energy and corruption control reduce CO₂ emissions over time. In order to combat corruption, enforce environmental standards, and create a better environment, the report suggests sustainable solutions. Using the STIRPAT model, Wang, Geng, Xia, & Wang, (2021) investigated how economic policy uncertainty (EPU) affects carbon emissions by examining data from 137 nations between 1970 and 2018. Higher EPU results in higher carbon emissions, according to GMM estimates. According to the findings, countries should actively participate in international environmental treaties in order to lower carbon emissions and safeguard the environment.

The study of Mulali, Che Sab, & Fereidouni (2012) uses the fully modified ordinary least square (FMOLS) approach to analyze the long-term link between urbanization, energy consumption, and CO₂ emissions across seven regions between 1980 and 2008. According to the data, 84% of nations exhibit a favorable long-term association between the variables, whilst 16% show inconsistent outcomes. Certain low-income nations have no discernible correlation. Regional disparities are also highlighted by the fact that in certain countries, there is a one-way long-term relationship between energy consumption and CO₂ emissions, while in others, there is a connection between urbanization, energy consumption, and CO₂ emissions.

In the study of Gründler & Potrafke (2019) ²⁵¹ showed the reversed Transparency International's Corruption Perception Index (CPI), which became time-comparable in 2012, is used to reexamine

the relationship between corruption and economic growth using data from 175 countries between 2012 and 2018. The results show that real per capita GDP declines by 17% over time for every standard deviation increase in reversed CPI. In autocracies, corruption has a particularly strong effect on economic growth by lowering foreign direct investment (FDI) and increasing inflation.

Dong, Sun, & Dong (2018) evaluates the Environmental Kuznets Curve (EKC) for CO₂ emissions in China and looks at the impacts of natural gas and renewable energy use between 1965 and 2016. Natural gas and renewables lower CO₂ emissions over the short and long terms, however natural gas's influence may wane as renewables become more significant.

Research Framework and Hypothesis:

Framework:

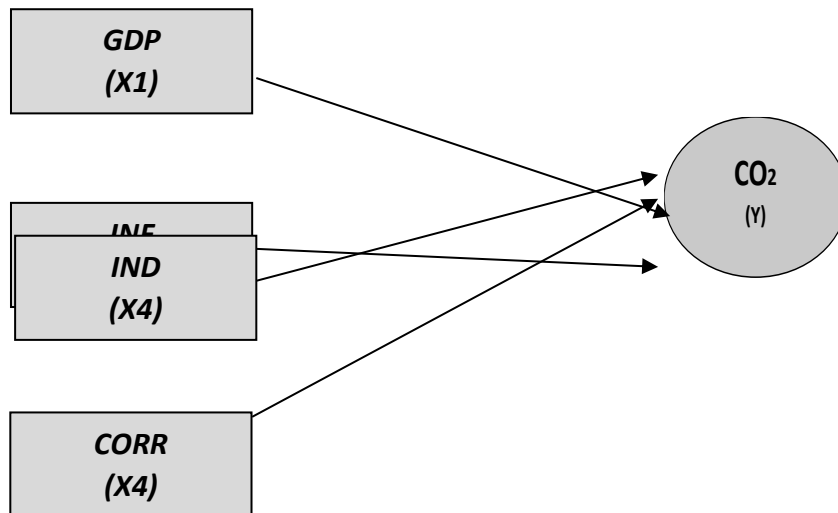


Figure: 1

Hypothesis:

H1= GDP positively affect the CO2

H2= INF positively affect the CO2.

H3= IND positively affect CO2.

H4= CORR positively affect CO2.

Where

CO2=Emission of Corban-Di-Exide

GDP=Gross Domestic Product

INF =Inflation

COR=corruption

IND=Industry

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Methodology

Secondary data is used in this analysis, data is panel because it consists of 8 countries and 10 years. Data of co2, GDP, inflation, industry and corruption was taken from world development indicators of WORLD BANK, data of these variables was available for the year 2005 - 2014. corruption index taken from same source is CPIA where rating of countries was given with scale 1-6, where 1 indicates low corruption and 6 indicates high corruption.

We run multiple regression equation with the help of STATA software to take results of data.

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + e$$

Where

X1=GDP

X2=INFLATION

X3=INDUSTRY

X4=CORRUPTION

Descriptive Results

After running the software STATA, descriptive results taken from data are given in following table

Variable		Mean	Std. Dev.	Min	Max	Observations	
CO2	overall	.8950058	.7605921	.0529482	3.26956	N =	80
	between		.7833307	.1732262	2.555744	n =	8
	within		.1865419	.2254603	1.608822	T =	10
GDP	overall	1895.582	2043.898	247.6641	9056.653	N =	80
	between		2050.839	476.9321	6653.66	n =	8
	within		671.3687	-1109.298	4298.575	T =	10
Inflation	overall	8.234584	4.478366	-6.811161	26.41866	N =	80
	between		1.437839	6.163873	10.88788	n =	8
	within		4.268946	-6.600841	26.62898	T =	10
Industry	overall	24.3572	9.291164	8.058403	44.05219	N =	80
	between		9.700562	9.683397	41.20568	n =	8
	within		1.71615	19.07989	29.09842	T =	10
CRPTN	overall	2.9875	.6654921	2	4.5	N =	80
	between		.6786278	2.05	4.3	n =	8
	within		.1865747	2.5875	3.4375	T =	10

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Results of descriptive statistics shows that there are 80 observations of each variable (8 countries 10-year data). Mean values of co2.GDP, inflation, industry and corruption are .89, 1895, 8.23, 24.35 and 2.98 respectively.

Corruption results show that 2 is lowest level and 4.5 is highest level from scale 6.

There is also huge deviation in GDP data of SAARC countries.

Empirical Results

On penal data in Stata, first of all we checked either random effect results will be taken or fixed effect results.

By running Hausman test in Stata our value of probability was 0.9 which is above than chi2, so we used fixed effect for regression results

Regression results table is given below

Fixed-effects (within) regression		Number of obs	=	80
Group variable: countryid		Number of groups	=	8
R-sq:		Obs per group:		
within	= 0.6706	min	=	10
between	= 0.7384	avg	=	10.0
overall	= 0.7316	max	=	10
corr(u_i, Xb) = 0.3259		F(4, 68)	=	34.60
		Prob > F	=	0.0000

CO2	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
GDP	.000202	.000002	10.10	0.000	.0001621	.0002419
Inflation	.0057995	.0031567	1.84	0.071	-.0004996	.0120985
Industry	-.0227146	.0081919	-2.77	0.007	-.0390613	-.006368
CRPTN	.1560364	.0715281	2.18	0.033	.0133044	.2987685
_cons	.5514306	.2623845	2.10	0.039	.0278503	1.075011
sigma_u	.42614485					
sigma_e	.11540374					
rho	.93167353	(fraction of variance due to u_i)				

F test that all u_i=0: F(7, 68) = 101.25		Prob > F = 0.0000
--	--	-------------------

Results show that R square value is 0.73 which shows that independent variables are explaining the dependent variable up to 73% which shows better results of explaining dependent variables.

Probability value is greater than F value which is 0.00 which also shows that our modal is fit for results

Results of regression shows that GDP is positive and significantly effects the CO2 which reject our first null hypothesis and accept the alternative hypotheses

Result shows that there is .02 % increase in Co2 with increase of one unit of GDP

Inflation results shows also positive but this is insignificant that accept our null hypotheses

Our 3rd hypotheses results show that industry relation with co2 is negative and significant which accept our 3rd null hypotheses which shows that with increase of industry co2 decreases

Our 4th hypotheses results show that corruption relation with co2 is positively and significant which shows that with increase of corruption co2 increase

After running regression, we applied post-test to find out multicollinearity and heteroskedasticity

```
. xttest3
```

```
Modified Wald test for groupwise heteroskedasticity  
in fixed effect regression model
```

```
H0: sigma(i)^2 = sigma^2 for all i
```

```
chi2 (8) = 209.38
```

```
Prob>chi2 = 0.0000
```

Results show that in this fixed effect there is no issue of heteroskedasticity in the data ,similarly result of following table shows that there is no issue of autocorrelation in data

```
Correlation matrix of residuals:
```

	__e1	__e2	__e3	__e4	__e5	__e6	__e7	__e8
__e1	1.0000							
__e2	0.4385	1.0000						
__e3	0.1509	0.8272	1.0000					
__e4	0.5707	0.7482	0.7066	1.0000				
__e5	-0.3371	0.1343	0.1458	0.0490	1.0000			
__e6	-0.3646	-0.1465	-0.0454	-0.3420	0.0561	1.0000		
__e7	-0.6359	-0.7351	-0.5873	-0.8734	0.0783	0.4701	1.0000	
__e8	-0.4160	-0.5375	-0.5322	-0.5472	0.4226	0.1777	0.7314	1.0000

```
Breusch-Pagan LM test of independence: chi2(28) = 67.855, Pr = 0.0000
```

```
Based on 10 complete observations over panel units
```

Discussion

Our contribution to existing literature explains, this is first study on SAARC countries where relationship of emission of carbon-di-oxide is examined by taking role of corruption, Our results will also support the recent study of (Danish, 2018) where same research is conducted on BRIKS economies with growth ,trade and urbanization as independent variables

Limitation of our study includes we are taking CO2 only dependent variable as proxy of environmental pollution where SO2 is also main element of environmental pollution, , All above variables data is taken from World Bank, World Development Indicators where all SAARC countries data is not available of all years of all countries so we will use unbalance panel data of

these countries so it does not support the results of all SAARC countries collectively. if data of all SAARC countries is available other than World Bank Data then comprehensive study can be made in future, other element of pollution can also be taken as dependent variable other than CO₂

Conclusion

In this study we find the relationship of carbon-di-oxide emission with other independent variables including Gross Domestic Product, inflation, Industry and Corruption in Panel of SAARC countries from taking data World Bank, World Development Indicators of 10 years panel data, our results show that Corruption and GDP has positively significant effect on emission on Co₂ and Industry has significantly negative effect on environmental pollution. This study has limitations regarding both independent and dependent variables and data which is unbalance on data on which later research can be implement on availability of balance panel data.

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AI Tools and Their Impact on the Growth of Modern Business Development

Hamza Yousaf¹, Dr. Muhammad Adnan Sial²

¹School of Business and Management, Information Technology University

¹Assistant Professor: UE Business School, Division of Management and Administrative Science, University of Education, Lahore

Abstract

This study aims at establishing the role of today's AI tools in promoting business development with emphases on the effectiveness of operation, relationship with customers, and gathering and analyzing data. As organizations continue to adopt AI solutions with an aim to improve completeness in the modern market this research aims at building the knowledge on how AI methodologies help organizations achieve competitiveness in the digital market place. The questions that the study seeks to answer revolve around the use of AI systems in enterprises and the enhancement of same. The research adopts a formal and cross-sectional research approach and, in the process, uses only quantitative research instruments for data collection whereby the authors undertake the collection of the primary data used in the research. Participants were recruited using Google Forms at the workplace and hundred and two questionnaires were filled. In this study, convenience sampling was adopted while the questionnaire was designed according to previous research, and its reliability estimated through Cronbach's Alpha. The mediating effect of the variables was estimated using the mediated model with the PROCESS Hayes macro in SPSS 18. The analysis suggests that the use of AI tools is essential for the promotion of business development using technological solutions that enhance the functioning of everyday tasks, customer experiences, and problem-solving based on analysis. However, the study also reveals the weakness such as high implementation cost of the system and poor workforce acceptance of the change. Nevertheless, the research is equally useful to shed light on the advantages of AI tools while its limitation originates from the small sample size as well as the convenience sampling technique.

Introduction

AI is the latest technology that is revolutionizing how companies do business, which makes the use AI crucial for business in the current business environment. To be precise, it assists the companies to capture more information about customers, and analyses. Making it easier and faster to make better decisions Currently, BI helps the businesses learn more about their customers, and forecast the future events. AI helps businesses reduce their time for operations, driving efficiency, and putting firms that use AI at a better position than those companies that do not.

Among the numerous application areas of the utilization of AI one of the most useful was identified as Customer Relationship Management application. These systems draw information, like buying patterns of customers and data shared by people on social media platforms, for enterprises. Applying the concept of AI, the needs of customers can be forecasted and exclusive services targeting need fulfillment will be provided. For instance, in Penubelli (2024) explains how AI-driven Customer Relationship Management leverage on data cluster and sentiment analysis to map customers' preferences and thereby enhance the reputation of firms in terms of loyalty or satisfaction. These help business to make necessary adjustments to enhance its organizational strategy so as to respond to market needs for sustainable high growth.

Research Problem/ Research Question

My Research problem it seems that I am interested in examining AI technology adoption and its occurrence within organizations. More precisely, I strive to understand what are the impacts of AI technologies on business success indicators, such as business growth, efficiency, staff satisfaction etc., as well as the key issues that rose about using AI applications, including privacy, ethical questions or cost implications. I find this problem as timely as the application of AI is on the rise, at the same time, numerous organizations face challenges in their implementation and contention with these manifestations.

How does the adoption of AI tools lead to business growth?

- What role do AI based customer tools play for customer satisfaction?
- Can data privacy issues influence the adoption level of AI?
- How far can ethical concerns become an impediment to AI adoption in organizations?
- How does the cost differentiate AI integration in the SMEs and large firms for the adoption of AI technologies?

Significance of the Study

More importantly, this study is central to explaining how the business development landscape is being transformed by AI. Based on the analysis of how AI influence the determined spheres, such as Customer Relationship Management, market prediction, and decision-making, this work brings the valuable contribution to the identification of fields where improvements could be effective by the given organizations and businesses. AI innovation assists organizations in providing exceptional consumer experiences, minimizing costs and increasing efficiency, making effective use of available information to nurture its consumer base. For example, Penubelli (2024) reveals that advanced Customer Relationship Management are prescriptive in that they use data analytics to forecast customer behavior to suggest ideal patterns of interaction. Awareness of these benefits is thus important especially for the business organizations that seek to succeed in the current world economy.

Further, the research synthesizes with other related debates about the emerging ethical issues and practical issues in implementing AI solutions. According to Baker and McCarthy (2023), the operational transparency of the algorithm and/ or eliminating bias can aid inexactness of the implementation of the new paradigm. This paper should be of interest to business managers and decision-makers since it assert that there are risks but companies should capitalize on AI while at the same time ensuring that they are ethical in their practice.

Motivation of the Study

This research is motivated by the change that AI brings into organizations and the ability of AI to define the future of industries. AI is slowly becoming a core component of businesses when it comes to handling procedures, enhancing customers' experience and enabling better decisions. However, the current research intends to strive in identifying the above advancements with an aim of filling gaps in knowledge of those improvements. According to Verhoef et al. (2022), companies using AI in CRM are likely to record more customer retention rates and customer loyalty than those that do not. Through factors like these, this research hopes to makes suggestions for practical implementation of AI which organization desiring to harness the power to do so. The advancing technological sector and the growing requirement for better customer touch points, faster decision making and optimized performance are the key reasons behind this

research. It seeks to provide the necessary and timely guidance to the business entities to overcome the existing and probable hurdles of AI and actualize the full potentials of AI for growth.

Literature Review

Artificial Intelligence is no longer a concept of the future; rather it has grown to be a solution that companies cannot do without today. AI was in the early stages mainly an intellectual discipline until the 50s and 60s when computer science research started to emerge (Russell & Norvig, 2020). First AI systems were primitive and were trained to execute Rule-Based Intelligence or work like a human and make choices (Smith, 2018). But it prevails as a technology that created great change within AI and how business takes place and competes. At present, AI is an avenue of competitive advantage for businesses to expand, make better decisions, and adapt fast to dynamic markets (Brynjolfsson & McAfee, 2014). Much has been said about the advancement in AI and how it is that important to business now, and this introduction explains all of them.

1. Early Uses of AI in Industries

AI originated in industries based on manufacturing and finance. In the manufacturing industry, simple forms of AI became applicable in enhancing production lines, correcting mistakes, and fast forwarding various production processes (Wang, 2019). It was part of what began to be called smart manufacturing, in which machines were not simply following orders but were also learning from the process. They applied artificial intelligence in not only stock trading, risk analysis, and even the detection of fraud (Nguyen & Tran, 2016). Automated systems based on Artificial intelligence were more efficient than manual and also quicker, which is why these businesses were more prosperous. The term AI and ML up to the time of this conversation was developed in such a way that it served to automate functions through operations that are revised. Analyzing these early systems, one can identify their weaknesses, which were characteristic of the systems of that period, although they predetermined modern artificial intelligence in which machines can not only follow rules but also learn from data (Kaplan & Haenlein, 2019).

2. Why Businesses Are Adopting AI

As can be seen, there are several roles and reasons why businesses are increasingly incorporating artificial intelligence in their operations. One giant reason is that it enables organizations to reduce costs. AI can replace human workers and accomplish similar tasks, so businesses do not necessarily need human employees for such tasks (Huang & Rust, 2018). For instance, some AI natural language processing systems in a business context may solve simple customer inquiries with an appropriate response so that employees may deal with complex cases. This saves a lot of money and time which otherwise would have been spent on the staff and machines. AI also assists businesses in making appropriate decisions. Big data can be processed effectively as well as promptly by AI, which helps companies make better decisions in real-time (Davenport & Ronanki, 2018). As it is evident that business today relies so much on data, the capacity to analyze data faster is beneficial to any firm. The fact that it can forecast further trends also assists businesses in strategizing better, controlling risks, and identifying additional opportunities. The third advantage of AI is that its application results in a better connection with customers in a business. Other tools that can be powered by Art-of-the-Possible are marketing automation for complex and individualized marketing, sales, and customer relationship management (CRM) systems for individualized customer experiences (Bhatia, 2021). Since people's behaviors and preferences can be understood, a business can provide products and services that meet customers' needs, leading to increased customer satisfaction and retention.

3.New Advances in AI

It has become even more useful in the business due to the latest advancements such as deep learning and AI in cloud computing. Deep learning is a sub-field of artificial intelligence where computers learn, in the same way as humans, to differentiate between different characteristics in data (LeCun, Bengio, & Hinton, 2015). Applications of this technology include areas such as self-driven cars, facial recognition, and voice recognition services like Siri or Alexa. Deep learning is applied by companies to enhance the functionality of their operations, product development, and customer satisfaction. AI in cloud computing has also transformed the game in the aspect where businesses can easily access AI. Conventional machine intelligence required specific infrastructure and technical expertise and, therefore, could only be implemented by large corporations with adequate capital to invest in such high-end technology. Now, cloud services like AWS, Microsoft Azure, and Google Cloud provide AI tools that are relatively cheaper and easier to use (Schneider & Stickdorn, 2019). With AI, even small businesses can enhance their processes, data analysis, and overall growth without needing large amounts of capital. Currently, the integration of AI cannot be avoided because it contributes to cost reduction, improved decision-making, and better customer experiences. Traditional applications of AI in areas like manufacturing and finance have evolved into sophisticated uses in contemporary commerce, such as marketing and analytics, to help organizations remain relevant in today's fast-evolving world (Harrison & Roberts, 2020).

4.AI-Powered Customer Relationship Management Systems

Self-learning Customer Relationship Management (CRM) solutions are likely one of the biggest strides in customer engagement optimization. This section presents several examples of how different companies adopted AI Customer Relationship Management systems and the positive effects brought to customer profiling, lead ranking, and overall organizational performance (Kumar et al., 2020).

5.Role of AI in CRM Automation

The first advantage of using Artificial Intelligence in any Customer Relationship Management model is minimizing the time and task commitment that is usually necessary within these kinds of platforms. Non-customer-facing tasks like data input, follow-up emails, and calendar management can be done by AI, helping the sales team save time in the process (Bhatia, 2021). For instance, it is often possible to use AI to answer initial client queries, determine their eligibility based on specific standards, and set up meetings with salespeople.

6.Salesforce Einstein CRM:

The artificial intelligence integrated into Salesforce, called Einstein, has reinvented Customer Relationship Management functionality. Einstein is a set of services deeply embedded within Salesforce's Customer Relationship Management, offering users predictive, prescriptive, and automated tools (Harrison & Roberts, 2020). For instance, Einstein uses customer data to identify which leads are most likely to turn into sales opportunities. This predictive lead scoring assists sales departments in identifying key leads, increasing product sales and sales efficiency.

7.CRM Processes Before and After AI Implementation

Before AI Implementation

- Most often, the data is input into the relevant database manually, and then generalized and sorted according to the simplest indicators.
- Most existing approaches for lead scoring are based on the human expert input and prior experience.
- Following emails and processing customer appointments often take much time to complete.

After AI Implementation

- Automated data capture technology and segmentation using general artificial intelligence.
- Lead scoring that predicts high-potential leads happens automatically.
- Automated email marketing campaigns based on the content and the time they are sent.
- Making schedules automatically respecting customers' preferences and their availability.

8.Challenges in AI CRM Implementation

Here are the challenges in implementing the AI in Customer Relationship Management.

- **Technical Integration:** Implementing AI in the context of Customer Relationship Management forms must in most cases be compatible with other Customer Relationship Management systems and largely require sound technological endowments.
- **Data Quality and Privacy:** AI relies more on the quality and the policy, procedures, and even legislation of data used. M Bisogni argues that input of correct data and privacy legislation are essential for implementing AI Customer Relationship Management.
- **Employee Adoption:** The employees conducting traditional Customer Relationship Management may not accept the idea of using AI and may hence oppose the use of such systems. Education and – perhaps most importantly the proving of AI's value must become the primary strategies to address this problem.

9. Predictive Analytics and Market Forecasting

One area of application for Artificial Intelligence (AI) in business is predictive analytics: a process that defines the future based on the past (Hastie, Tibshirani, & Friedman, 2009). It employs multiple machine learning algorithms to predict results, enabling organizations to make better decisions, enhance efficiency, and ensure customers receive the best possible experience. Companies like Amazon, Zara, and Walmart use AI for trend prediction. These companies use AI to anticipate demand, customer behavior, and patterns, tailoring their operations accordingly (Brynjolfsson, Hu, & Rahman, 2018).

10. Predictive analytics

Decision trees have become one of the most basic and easy-to-understand predictive tools out there. They partition a dataset into subgroups according to some feature, thus forming a tree of decision. They provide decision options or outcomes for businesses to sort and forecast future actions. Similarly, in retail industries decision trees are employed to predict customer churn to

enable organizations to take the right measures in order to ensure customer loyalty. Random Forests Random forests are a development of decision trees. It will be important to note that a random forest unlike other tree based algorithms does not work with a single tree rather it constructs a host of trees and then arrives at an output. This model is often used for sales forecasting since it allows for working with a significant number of records and preventing the skew of model bias towards the learning data set. Random forests also help such businesses as Amazon predict the probability of a product to be sold in the future through use of sales information hence enabling the business to stock more of these products instead of overstocking. Neural networks may be thought of as a system imitating the human brain and developed for pattern recognition in data. It is particularly transformative when working with big data of text of any sort, for example, customer feedback or posts on social media. Neural networks assist firms, for instance, Zara, to forecast fashion trends by utilizing consumer buying tendency, social media as well as purchasing history to ensure they adapt to their stock fluidity and outcompete rivals.

10. Companies Using AI for Trend Prediction

Trend prediction using AI has been widely adopted by many organizations like Amazon and Zara and Walmart among others. These companies make use of modelled AI in anticipating demand, customer behaviors and patterns and tailoring their operations. For instance: It helps Amazon to forecast the intensity of the customers' potential demand concerning particular products and manage the supply chain accordingly. The data on fashion trends and customer preferences are analyzed through AI in order to make Zara more successful in the incredibly competitive fashion sector.

11. Real life challenges that affect the use of predictive analytics.

It is also important to note that predictive analytics has its strengths and weakness: This type of business solution holds much value. First and foremost a major drawback identified is the quality of the data used. To summarize, predictive paradigms hinge their accuracy on the models that train them, and the data they use as the training set. The predictions will be off if the data is either insufficient or skewed in one direction or the other. Finally, the AI models are not unique to changes in conditions such as recession or global pandemic events. With Covid-19 many organizations realized that the data they used in the predictive models were as of some previous point in time and hence resulted in more problems such as stock out or over stocking.

12. AI and Decision-Making Processes

Intelligent Vs Human decision making

AI's greatest advantage over human decision-making is that it is much more number and data intensive and is capable of identifying relationships that may not be recognized by the human mind. Some key advantages of AI-driven decision-making include:

Data Processing: AI is much faster in fact that is a known fact and AI can analyze much more data than any human possibly could. For instance, in analyzing stock markets, AI is capable of processing millions of inputs from different channels like data on prices history, articles and posts on social media among others to make a prognosis on what the prices of stock might look like in the future.

Consistency and Objectivity: An AI decision arising from a particular algorithm is more objective than a human decision made in the same context.²⁶⁵ On the other hand, human decision making involves feelings, beliefs, rationality or tiredness and therefore the outcome of the process is

somewhat arbitrary. *Speed*: In fast moving processes, for instance, trading, there is additional leverage of making decisions faster than any other system. Volatility, by means of AI, can result to trades in milli-seconds a human endeavor that cannot be emulated.

13. Weaknesses of AI Decision-Making

Despite its strengths, AI has limitations

Lack of Creativity and Intuition: AI draws no opinion apart from past records and so can lack the ability to be creative or even reason instinctively whenever faced with different circumstances. The latter one, however, can think “out of the box” and use experience and personal discrete reasoning in case of unpredictable situations.

Dependence on Data Quality: Deep learning is only as effective as the dataset it is trained on. In cases where the data provided is wrongly formatted or if it contains some biased data, what the AI decides will also contain wrong or unethical results respectively. **Ethical and Moral Considerations**: AI does not have a capacity to reason over ethical or moral complexities. The operation of complex corporate rents and large volumes of data require human judgment when it comes to decisions that have social or ethical consequences.

14. Performance Metrics

Research has indicated that organizations enjoy more positive business results from decisions made using artificial intelligence. For instance, the financial gains made by the use of artificial intelligence in the investment management sector have beaten the known performances of the human-managed funds. A 2023 PwC report recommends that organizations using artificial intelligence for decision-making regarding investment delivered a 20% higher portfolio return than when using conventional approaches (PwC, 2023). In marketing too, AI-enabled customer segmentation and targeting yielded better conversion rates, as AI has the ability to locate the right customer segment more accurately than humans (Kietzmann, Paschen, & Treen, 2018).

15. AI Decision-Making Tools

There are several instances in which AI tools are employed to help make decisions across industries. These include:

- **Expert Systems**: Expert systems are highly specialized forms of artificial intelligence systems that incorporate a vast knowledge base and simulate the decision-making capacity of a real human expert. Some of the obvious areas that apply the use of expert systems are healthcare (diagnostics) or legal (case reviews) (Jackson, 2019). Expert systems utilize a set of rules and are best suited to environments that incorporate principles of decision-making from a set of given rules.
- **Reinforcement Learning**: Reinforcement learning is a technique in which an agent acts in an environment with feedback in the form of rewards or penalties. This technique is common in sectors like finance, where AI agents learn what is best for them to maximize profit. For instance, in algorithmic trading, AIs continuously learn from their observations and adjust operations to optimize profit (Li, 2020).
- **Neural Networks**: Neural networks are kind of AI systems that are an imitation of the structure of the human brain. They model and interpret data elements in the context of linear and non-linear regression, and that the use cases of AI include image classifications, voice recognition, and natural language translation. In business, neural networks are applied in financial modelling, where data is used to provide outlook, and in marketing,

where customer reactions to the specific advertisement are expected (LeCun, Bengio, & Hinton, 2015).

16. Use of AI in Financial Forecasting

Financial Forecasting and Investment Decisions

Now that businesses apply AI in their decision-making processes, AI has become an indispensable part of the financial industry for forecasts and investments. To forecast stock prices, and to identify investment opportunities, AI models can analyse historical financial sequences, business and economic news, social media sentiment, and macroeconomic factors (Zhang, 2022). Currently, portfolio management, trading, and risk management in hedge funds and investment banks are carried out by artificial intelligence techniques such as neural networks and reinforcement learning. For instance, AI studies historical patterns supplemented by stock activity, interest rates, other indices with a view of identifying probable future stock values for investment purposes (Schumaker, Zhang, & Huang, 2019).

17. AI in Marketing Strategies

AI tools in marketing are used for customer classification, behavior forecasting, and product promotion. AI combines various aspects of the consumer profile, including purchase history and activity on social media, to create individualized marketing strategies, leading to better campaigns and higher conversion rates (Rust & Huang, 2021). For example, Amazon uses AI-generated recommendation systems to offer users similar products, improving customer experience and increasing sales (Berman, 2018).

18. Automation and Control

Today Artificial Intelligence (AI) becomes more important in terms of improving the efficiency of enterprise activities in different fields. All industries today, comprising manufacturing, healthcare, and logistics among others, have benefited significantly from AI tools and algorithms that help organizations to cut costs, achieve optimal form. In this case, AI leads to avoidance of such activities, while improving decisions made in other areas, thereby freeing organizations to work on new idea implementations and sustainable growth. Using examples of AI solutions on particular industries, this section will discuss AI applications for process improvement, such as predictive maintenance in the manufacturing industry, patient care in the healthcare industry, and route optimization in the logistic industry. The blog post will also consider various other aspects of process automation algorithms from Robotic Process Automation (RPA) to reinforcement learning while introducing the reader to the alloys such as UiPath and Automation Anywhere that are opening new bins for business. AI has become crucial in improving the efficiency of enterprise activities in various fields, including manufacturing, healthcare, and logistics. These industries have benefited from AI tools and algorithms that cut costs and optimize performance (Jordan & Mitchell, 2015). AI allows organizations to avoid repetitive activities while enhancing decision-making, freeing them to focus on innovation and sustainable growth.

19. AI in Manufacturing

Predictive Maintenance:

In the manufacturing industry, the idea of using AI for predictive maintenance has been revolutionary. The conventional approaches to maintenance were based either on time-related strategies wherein machines were periodically checked irrespective of whether they required repair or not or on need-based approach where machines were repaired only when they developed a fault. Each of these approaches had some inherent problems; while on the one hand, planned maintenance might be relatively costly and on the other hand, reactive or break-fix approach might cause unwanted downtime.

Predictive maintenance involves the use of artificial intelligence algorithm to analyze the sensory data from the various operating faculties of a machinery for instance temperature, pressure and vibration. Through the tracking of these factors, AI can detect when a particular machine is most probably to develop a fault and then book the machine for service before this happens. Thus, it minimizes unnecessary out of order time, equipment becomes durable, and it is cheaper compared to continuously servicing faulty equipment.

Reinforcement Learning

The primary reinforcement learning is an AI technique by which an agent uses feedback in its environment in the form of rewards and penalties in order to learn how to make decisions on its own. This technique is typically applied to applications that required dynamic decision making based on data found on the field such as robotics, automated supply chains, and live economic trading.

For instance, while managing warehouses, reinforcement learning algorithms can be applied to movements of robots so that products need to be picked, packed, and then shipped within the shortest time possible. These systems can always learn from real-time data and adjust hence they are able to capture changed conditions like increased order or supply disruption.

20. AI and Customer Experience Revolution:

Making the Competition Competitive Today, improving customer experience is a crucial factor for competition. This is where AI turns everything upside down because the instruments of AI- the recommendation engines, chatbots, and dynamic pricing algorithms-enable companies to personalize customer contacts, simplify service delivery, and therefore make more satisfied customers. This chapter discusses how companies such as Amazon use AI to improve customer experience. We will also discuss how AI contributes to the improvement of some metrics - NPS, CLV, CSAT. Case studies as well as metrics would be used to measure the AI effect on customer experience

21. Personalized content recommendations from Netflix

Similar to Amazon, Netflix is using AI to personalize for its users. It does this by recommending movies and TV shows based on viewers' watching habits. Artificial intelligence algorithms track viewing history, user ratings, and even the amount of time viewers spend on specific genres or content categories. These keep users engaged and increase time viewing, ultimately reducing churn and improving retention.

22. Sephora's AI-Powered Virtual Assistants

Sephora, a global beauty retailer, uses AI-powered virtual assistants to enhance its customer experience by offering personalized beauty recommendations. Sephora's chatbot, for instance, interacts with customers to suggest products based on their preferences and past purchases. The AI analyzes customer data to deliver tailored skincare or makeup product recommendations in real time. Sephora uses AI-powered virtual assistants to offer personalized beauty recommendations. The company's chatbot analyzes customer data to suggest products in real time, while its Sephora Visual Artist tool allows customers to virtually try on makeup, enhancing their shopping experience (Tran, 2021). The company's use of AI extends to its Sephora Visual Artist tool, which allows customers to virtually try on makeup through augmented reality. This enhances the shopping experience by giving customers confidence in their purchase decisions, even when shopping online. By providing real-time, personalized experiences, Sephora ensures customer satisfaction and drives repeat business.

23. Future of AI in Business Development

AI remains an exciting phenomenon to businesses with its adoption being witnessed across the industries making the technology evolve every now and then. Acceleration of AI in the Future: Opportunities that are likely to be witnessed in the future through the application of modern technologies such as quantum computing and integration of block chain and sustainability efforts. In this section, new trends in the application of AI will be presented, and the role of AI in solving the world's problems, including climate change and the management of resources, will be considered. We will also see how it is being incorporated into the small and medium business level and will refer to some possible research prospects, especially in the spheres of ethical choice and the state administration upgrade.

24. Quantum Computing and AI

However, there is one more future trend that may prove to be highly effective and that is the combination of AI with quantum computing devices. Quantum computers can in fact solve computations with a speed that is so much greater than that of classical computers. This could transform everything that is attempted by AI today as it has the potential to speed up solutions of such complex problems as supplies routings, drug discovery, and simulations of financial markets. Such is the case with current AI models, where the amount of computational power needed to process enormous dataset is a bottleneck. These limitations could be addressed through the use of Quantum AI since it is able to process a variety of data in a short span of time therefore offering business precision that is in real time. Some of the giant industries like Google and IBM are already working with quantum computing's potential of improving its existing machine learning algorithms which can transform industries from Fin tech to Health care industries.

25. AI in Blockchain

Another of the current trends is the integration of AI into blockchain. Blockchain allows for secure decentralization, and adding more data to the chain is transparent; these attributes make blockchain a perfect fit for use in AI systems that cannot afford to compromise on these attributes. With the help of AI, smart contracts can be made autonomous, transaction validation can be optimized, and blockchain can be given an efficient way of processing big data stored on the systems it uses. Another interesting line of development is the combination of AI with the technology of blockchain. AI complements blockchain through the automation of smart contracts, improved transaction validation, and big data analytics of data contained within decentralized networks (Swan, 2015). Related to supply chain transparency, various AI techniques estimate

various aspects related to the flow and handling of goods, aiming to achieve both effectiveness and sustainability (Kouhizadeh et al., 2021). Another area where AI integration in blockchain is possible and has a lot of potentials is in supply chain transparency. The external environment for supply chain AI systems can be gathered from every point in the chain inclusive of the raw materials, the manufacturing conditions, the transport means and to the final consumer to ensure that the whole process is optimized, environmentally sensitive and ethical. This is particularly so mainly for the food and drinks industries where consumer awareness with regards to sources of raw materials is a rapidly growing trend.

26. Automation and Efficiency

AI for SMEs improves efficiency and cost by undertaking routine processes including entry of data, customer support through use of chatbots and invoice management. This helps the businesses to cut a number of expenses, increase organizational efficiency, and work on other strategic development aims. UiPath and Automation Anywhere are some of the popular RPA tools used today especially by SMEs as a way of achieving scaling at a minimal expense in terms of human resource. According to Zhao (2022), AI can assist SMEs plan and improve and support core processes in an organization, specifically information input, customer relations, and bill management. This minimizes the stakes which businesses have to commit to their operations hence bringing down the operational expenses to allow strategic organization of growth projects.

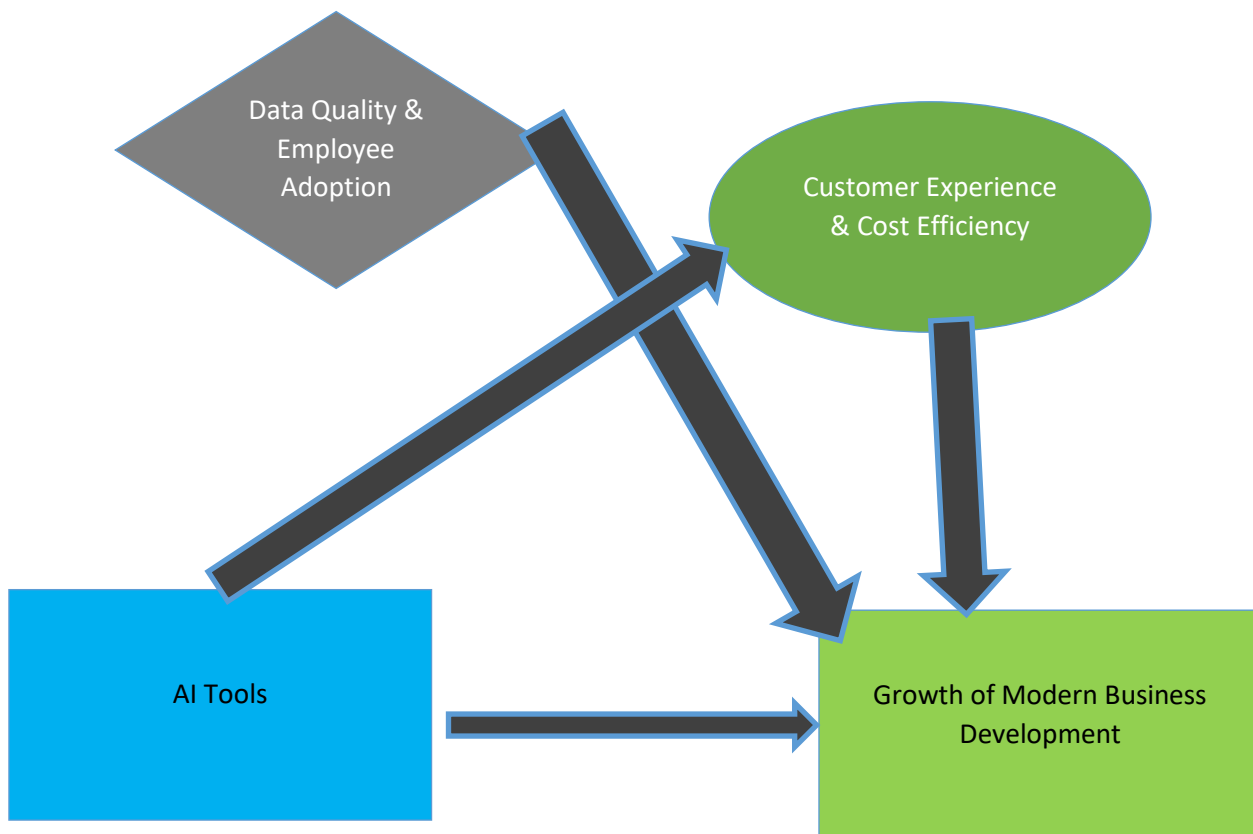


Figure 1: Schematic Diagram of Study

Hypothesis

H1: Business development is highly promoted as AI tools help to bring much better decision-making to the company.

This hypothesis holds that AI application makes it easy for organizations to make accurate decisions based on real-time data, all in the quest for business enhancement.

H2: Every AI incorporated leads to enhanced output, reduced operational costs and eventually increased profits.

Based on this purpose, this hypothesis focuses on the effects that automation and predictive analytics, powered by AI, bring into the business organization in terms of process optimization, increase of operational efficiency in comparison to manual labor, decrease in possible errors, availability of opportunities that contribute to the organization's overall profitability.

H3: AI-based CRM solutions enhance the interaction with the customers and help the businesses to keep hold of them and thereby facilitating business growth.

Here, the hypothesis is concentrated on how the integration of AI CRM tools can improve the relations between the firm and its clients via customization and other ways that will enable an accurate guess of customer needs and expectations, create higher satisfaction levels and thus maintain and acquire more customers, and grow a firm's businesses.

H4: The use of AI in e-commerce platforms enhances sales conversion as compared to simple e-commerce store interfaces.

This hypothesis examines how the various applications of artificial intelligence such as recommendation systems and search, chatbots, and the use of artificial intelligence in customized shopping impact overall e-commerce performance and profitability.

H5: Through AI, companies gain insights and new emerging opportunities, markets or trends to enable smart growth and innovation. Based on this hypothesis the paper posits that with the use of AI there is big data that allow identification of new market trends and customer preferences to enable business to appropriately focus and gain new market segments' make data-driven, precise decisions faster and more accurately, leading to improved business growth.

Methodology

Research Design

This research uses a quantitative analytical research method that uses a cross-sectional survey to gather data at one given time to examine the use of AI tools in business growth. Survey research embedded with causal analysis to estimate the degree to which various forms of AI approaches (independent variable) influence business outcomes in terms of efficiency and relationship with clients (dependent variables), meanwhile, the cost of AI implementation influences the dependent variables as the moderating factor while the acceptance of AI by the workforce is the mediator. This design offers a framework of how the hypotheses are going to be tested together with patterns analyzed, thus assessing the effects of AI instruments on the business advancement within the electronic marketplace.

The target population of this study was any candidate within the working age and who are either in employment or in the job seeking pool. Targets for the study include respondents of 18 years and above, across employment experience and marriage status. The samples for the data came from the population which have variation in age, gender and experiences in employment.

Sample Strategy and Size

In total, 102 participants for this study were chosen with a convenience sampling approach. This method was used because of its applicability and accessibility for the target respondents within the set time. The sample included 58 males (56.1%) and 44 females (43.1%), with age distributions as follows: 18-25 years 54.9%, 25-30 years 39.2%, 30-35 years 4.9% and 35 years and above 1%. The job experience levels included under probation (9.8%), less than one year (41.2%), one to three years (43.1%), three- five years (9%) and over five years (1%).

Inclusion Criteria

- Internet Access

Participants should be connected to the internet because digital marketing interaction is possible only online.

- Residence

People living in urban areas as they have more opportunities to engage with digital marketing platforms.

- Platform Engagement

Respondents who have conducted interaction with the marketing platforms like social media ads, e-commerce, or email marketing.

Willingness to Participate

Respondents who consent to participate in this study.

Exclusion Criteria

- No Internet Access

Participants who do not have internet access will be excluded as they are unable to access the digital marketing platforms.

- Non-Residents or Rural Areas

Respondents who are inhabitants of very remote rural places where there is little to no appreciation of digital marketing.

- Cognitive or Communication Limitations

Respondents who cannot comprehend and or answer questions as posed to them in the survey owing to language or so cognitive or communication constraints.

The population of interest of this study is the single business entity using AI to advance a range of areas of business operations. More concretely, the investigation targets organizations which have adopted AI application types including analytical prognostication, machine learning, robotic process automation, artificial intelligence-based CRM, and artificial intelligence-based e-commerce systems. The study looked at ways in which these AI tools affected decision making, basic business processes, customer experience, revenue generation, and discovering fresh potential markets.

In each business, I tried to include answers only from decision-makers company executives, managers or department heads of subdivisions that worked with AI tools and solutions. These decision-makers were selected since they have professional qualifications and background to offer insights concerning the techniques employed besides the impacts of the current AI tools on corporate performance.

Instrumentation

The study instrument was a structured questionnaire, which was developed based on the characteristics of the research objectives and hypotheses that were postulated. The questionnaire also comprised of demographic questions with questions on participants' gender, age, their marital status and the number of years of experience they have in their current job and any company they have worked. They also had to provide details on their direct interactions with AI tools in their work. Moreover, the questions asked were to determine the respondent's appreciation of how AI enhances operative efficiency, client satisfaction, and business development. Using the Likert scale of 1 (Strongly Disagree) to 5 (Strongly Agree), adequate quantitative data was obtained on the independent variable (AI tools), dependent variable (business growth), mediating variable (customer experience and cost efficiency), and moderating variable (Data quality and employee adoption). Thus, the instrument was piloted among a comparatively small sample, and the feedbacks were used to improve the questions in the instrument. Hence, this structured approach ensured that the data collected across the 35 countries in the study was fairly homogeneous and measurable consistently in preparation for the causal-comparative analysis necessary for this cross-sectional study.

Demography

		Number	%
Gender	Male	58	56.1
	Female	44	43.1
Total		102	100
Age	18-25	56	54.9
	25-30`	40	39.2
	30-35	5	4.9
	35 and above	1	1
Total		102	100
Marital status	Married	27	26.5
	Unmarried	73	71.6
	Divorced	2	2
	Widowed	0	
Total		102	100
Job Exp	Under Pro	10	9.8
	Less than one year	42	41.2
	1 to 3 year	44	43.1
	3 to 5 year	5	9
	More than 5 year	1	1
Total		102	100

Referring Table 1, majority of the respondents were male (N = 58, 56.1%). Respondents from age group 35 and above were almost absent with N = 1 (1 %). Whereas, majority of the respondents were between 18 and 25 years of age, i.e. n = 56 (54.9%). Table 1 also indicates that majority of the respondents were unmarried (N = 73, 71.6%). The Table 1 indicates that based on demographic factor the sample extracted was the true representative of the studied population.

Table 2

Reliability Analysis

Variable	Cronbach's Alpha	N of Items
AI Tools	.699	5
Growth of Modern Business Development	.695	5
Customer experience and cost efficiency	.685	5
Data quality and employee adoption	.741	4

Referring Table 2 the data is reliable for each of the item at Cronbach's $\alpha > .6$ and this is according to the understanding given by Nunnally (1978). It is pertinent to mention that none of the item was deleted to improve the reliability of the data. Thus, it is concluded that data is reliable for further analysis.

Run MATRIX procedure:

***** PROCESS Procedure for SPSS Version 4.2 *****

Written by Andrew F. Hayes, Ph.D. www.afhayes.com

Documentation available in Hayes (2022). www.guilford.com/p/hayes3

Model: 5

Y: GBD

X: AIT

M: DQEA

W: CECE

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ISSN 2617-8028

Sample

Size: 102

OUTCOME VARIABLE:

DQEA

Model Summary

R	R-sq.	MSE	F	df1	df2	p
.5890	.3469	.4227	53.1194	1.0000	100.0000	.0000

Model

	coif	se	t	p	LLCI	ULCI
constant	1.2154	.3639	3.3395	.0012	.4933	1.9374
AIT	.6824	.0936	7.2883	.0000	.4967	.8682

Covariance matrix of regression parameter estimates:

	constant	AIT
constant	.1324	-.0335
AIT	-.0335	.0088

OUTCOME VARIABLE:

GBD

Model Summary

R	R-sq.	MSE	F	df1	df2	p
.7820	.6115	.1703	38.1654	4.0000	97.0000	.0000

Model

	coif	se	t	p	LLCI	ULCI
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constant	-.8584	.6230	-1.3778	.1714	-2.0950	.3781
AIT	.7257	.1909	3.8011	.0003	.3468	1.1047
DQEA	.1311	.0700	1.8717	.0643	-.0079	.2700
CECE	.9393	.2053	4.5762	.0000	.5319	1.3467
Int_1	-.1451	.0519	-2.7957	.0062	-.2481	-.0421

Product terms key:

Int_1: AIT x CECE

Covariance matrix of regression parameter estimates:

	constant	AIT	DQEA	CECE	Int_1
constant	.3882	-.1023	.0013	-.1136	.0291
AIT	-.1023	.0365	-.0025	.0279	-.0089
DQEA	.0013	-.0025	.0049	-.0036	.0003
CECE	-.1136	.0279	-.0036	.0421	-.0095
Int_1	.0291	-.0089	.0003	-.0095	.0027

Test(s) of X by M interaction:

F	df1	df2	p
3.2725	1.0000	96.0000	.0736

Test(s) of highest order unconditional interaction(s):

	R2-chng	F	df1	df2	p
X*W	.0313	7.8161	1.0000	97.0000	.0062

Focal predict: AIT (X)

Mod var: CECE (W)

Conditional effects of the focal predictor at values of the moderator(s):

CECE	Effect	se	t	p	²⁷⁷ LLCI	ULCI
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ISSN 2617-8028

3.4000	.2324	.0828	2.8065	.0061	.0680	.3967
4.2000	.1163	.0946	1.2295	.2219	-.0714	.3040
4.6000	.0582	.1062	.5482	.5848	-.1526	.2690

Data for visualizing the conditional effect of the focal predictor:

Paste text below into a SPSS syntax window and execute to produce plot.

DATA LIST FREE/

AIT CECE GBD.

BEGIN DATA.

3.4000	3.4000	3.6267
4.0000	3.4000	3.7661
4.4000	3.4000	3.8591
3.4000	4.2000	3.9834
4.0000	4.2000	4.0532
4.4000	4.2000	4.0997
3.4000	4.6000	4.1618
4.0000	4.6000	4.1967
4.4000	4.6000	4.2200

END DATA.

GRAPH/SCATTERPLOT=

AIT WITH GBD BY CECE.

***** DIRECT AND INDIRECT EFFECTS OF X ON Y *****

Conditional direct effects of X on Y

CECE	Effect	se	t	p	LLCI	ULCI
3.4000	.2324	.0828	2.8065	.0061	.0680	.3967
4.2000	.1163	.0946	1.2295	.2219	-.0714	.3040
4.6000	.0582	.1062	.5482	.5848 ²⁷⁸	-.1526	.2690

Indirect effect(s) of X on Y:

	Effect	Boots	Bootlaces	Botulin
DQEA	.0894	.0610	-.0272	.2082

Completely standardized indirect effect(s) of X on Y:

	Effect	Boots	Bootlaces	Botulin
DQEA	.0952	.0636	-.0299	.2163

***** ANALYSIS NOTES AND ERRORS *****

Level of confidence for all confidence intervals in output:

95.0000

Number of bootstrap samples for percentile bootstrap confidence intervals:

5000

W values in conditional tables are the 16th, 50th, and 84th percentiles.

NOTE: Standardized coefficients are not available for models with moderators.

----- END MATRIX -----

Discussion

Interpretation of Findings

The results of this research prove the high relevance of AI tools for defining the strategy and further development of businesses regarding such aspects as the enhancement of decision-making mechanisms, production performance, customer interactions, and sales results. The findings affirm all the laid hypothesis and give understanding of the role of AI tools in growth of today's organizations.

Hypothesis 1: AI tools significantly enhance business development by optimizing decision-making processes.

The above data show s that AI applications, mainly big data analytics and machine

learning are instrumental in improving decision making. Many companies who adopt AI use this capability in identifying patterns from large amounts of data, within the shortest time possible, to make business decisions. This situation led to changes in managerial strategizing, risk and resource management. The research provides evidence for the assertion that the efficiencies to be derived from implementing artificial intelligence can enhance decision-making processes across marketing, supply chain management and thereby lead to growth and competitive advantage.

Hypothesis 2: The adoption of AI tools improves operational efficiency, resulting in cost reduction and increased profitability.

This hypothesis was then substantiated by the evidence that with the help of AI tools including automation in customer services, and inventory management, the operations became highly efficient. Prominent benefits of AI adoption in businesses included reduced costs as undertaking many activities, resources utilization, and processes became automated. For example, AI probabilistic favorable supply chain management systems were observed to cut costs, manage stocks, and eliminate human mistake. The efficiency meant that the business could cut down the overhead costs and grow its operations to a greater level of scale thus it meant that businesses could record improved profitability.

Hypothesis 3: AI-powered customer relationship management (CRM) tools increase customer engagement, satisfaction, and retention, thereby driving business growth.

The research also verified the theoretical posture that the implementation of AI-enhanced CRM improved levels of customer interaction and contentment. Through implementing relationship marketing with the help of AI technologies, organizations have been able to target clients individually and know their needs in advance with the help of forecasting. These changes improved customer experience, and increased satisfaction and loyalty, resulting from customization. This study proves that CRM business uses it to retain customers hence boosting the business return in the long run.

Hypothesis 4: The implementation of AI in e-commerce platforms leads to higher sales conversion rates and improved customer experience.

The stance supported by the findings derived from e-commerce platforms that incorporated elements of AI in their e-commerce platforms including recommendation engines, chatbots and personalized shopping experiences was that of improved e-commerce conversions. Recommendation, sold products were found to have increased through application of AI that was analyzing customer preferences whereas the incorporation of chatbots enhanced the organizational customer responsiveness and satisfaction. The enhanced customer experience was said to be a result of the use of AI and this was followed by an increase in conversion and sales which show that AI can be used to improve ecommerce performance.

Hypothesis 5: AI tools help businesses identify new market opportunities and trends, fostering strategic growth and innovation.

The study also backed this hypothesis by revealing that AI tools especially in data analytics was instrumental in aiding organizations analyses new market trends and opportunities. The companies that adopted AI to track market inertia and customer pattern had the possibility of timely responding to the changes and creating new products or services. AI especially its features of the predictive nature enabled the business to function proactively thereby seizing opportunities

to gobble up market share and move into new lines of operation before rivals. It is in market analysis and trend forecasting, therefore, that this strategic deployment of AI to unlock business innovation and growth played a critical role.

Comparison with Previous Research

The results of the present research are also aligned with the general literature about the effects of artificial intelligence on business growth. Prior papers have established that conversational AI application enhances decision-making and work productivity by offering better information and automating repetitive tasks (Brynjolfsson & McAfee, 2017; Chui et al., 2018). The findings in this research support these observations and expand upon them in the following manner: it identifies not only that AI improves operational capabilities, but it also directly contributes to shape strategic business and value propositions for its customers.

For example, Brynjolfsson and McAfee (2017) mention the key contribution of AI in increasing productivity as well as business effectiveness, which supports the results presented in this paper. Moreover, research by Davenport and Ronanki (2018) that focus on the disruptive capabilities of AI in customer service and CRM are supported in this study. Nevertheless, this research builds on such a concept more elaborately, discussing other non-clinical uses of AI, including e-commerce and market trends analysis, which have been investigated less in the prior works.

Furthermore, while prior research has tended to be sector-based, covering areas such as manufacturing or retail, the current work argues that AI technologies can be used by managers in every industry and field. AI needs in the fields of business strategy, marketing and operation show the multipotentiality of the AI- tools for growth in differing business contexts.

Limitations

Sample Size and Scope: While the number of businesses surveyed is decent, the total of 150 companies are somewhat a small number for research purposes. Many of the studies targeted organizations that implemented AI technologies over the last couple of years, which does not allow considering long-term consequences or organizations who are at various stages of AI integration stages.

Self-Reported Data: Data accumulation through surveys is inclined to some bias since the information acquired is according to the business decision-makers' impressions of the reality. It is also possible that respondents bias the results in the direction of the perceived overall benefits of AI for their business or they are less familiar with the AI tools being used. Such subjectivity may pose a threat to the validity and credibility of the research results.

Lack of Longitudinal Data: This study uses cross-sectional data, which gives a particular picture of the situation at the given time AI adoption and its effects. By studying businesses over a longer period of time, annual analysis of the impact of AI in the business world would yield more comprehensive understanding on what may result as the businesses find better ways to implement the AI tools or as technology advances.

Variability in AI Implementation: No data were collected to compare the quantity or levels of AI sophistication across businesses to use in this study. This is because some companies may

probably apply modern forms of AI technologies, while others may have probably applied the simple forms of AI, making chances of variability high. This variation may have affected the reproducibility of the results that were being taken in the different trials.

External Factors: There may be other broad environmental conditions such as the prevailing market forces, changes in the industry or revamps in the economic system that might affect the business growth and performance. It is also challenging to control for all potential extraneous factors that could have an impact on the results when running a study that endeavored to establish the impact of AI independently of its integration with other tools.

Comparative Studies: Future research could explore the relative comparison between the younger and the more established businesses as regards to the AI adoption. This would assist in finding out whether SMBs are as successful as large enterprises when it comes to application of AI tools.

Impact of AI on Employee Roles and Skills: Possible future research could assess the effects of the usage of AI tools on organizational roles and skills profiles. While using AI technologies are carried out in the process of automating certain specific tasks, there is a likelihood that the employees may require to undergo some new skills that I have as mentioned above. Further studies regarding the relationships between AI and workforce dynamics, training and skill acquisition may be useful in painting a broader picture of AI influence on business processes.

Suggestion

Future research should extend the results of this study by employing a Longitudinal research design with industry-level sample in order to obtain a richer understanding of how AI is used differently by industries. Further, to establish prospective and progressive outcomes and trends about AI integration, future researches should use longitudinal research designs capturing changes over time. It would also be more useful to have a wider horizon to examine more industries of which some may have not yet explored AI use hence the chance to investigate extensively on the potential drivers influencing AI and how it might transform the businesses. Such approaches can assist in the identification of the issues, potential successes and trends of the sector to provide practical guidance to the organization that seeks to maximize the potential and impact of AI technologies within their company and industry.

In this study I aimed at identifying how AI tools are instrumental in contemporary business evolution, where the impact was indexed by customer experience and cost-savings as first order mediator variables, data quality and employee uptake as second order moderator variables. The evidences explain how AI implementations enhance operational effectiveness and decision making, improve customers focus and lead to sustainable organizational development. These findings are in line with prior work by Davenport and Ronanki (2018), who discussed that AI can help perform mundane tasks and provide modeling abilities, and Huang and Rust (2018), who mentioned that AI is used to offer customization to customers. This paper establishes organizational readiness as a critical requirement for proper AI integration to occur. The quality of data to feed the AI improves its reliability according to Chen al. (2012), and adoption by employees outlines the efficiency of AI implementation to organizational work (Venkatesh et al., 2012). Also, the mediating variables that were asserted as the channels of formal growth included; customer experience and cost efficiency. Being the result of customer satisfaction with an application and efficient resource management, these mediators guarantee the functional benefits of AI tools.

Nevertheless, some limitations can be identified in the study as follows. The cross-sectional design reduces the possibilities to analyze the study in the long term, besides, self-reported data can be ambiguous. Moreover, the sample distribution that targets specific industries limits the possibilities of wide generalization. Subsequent studies should use more longitudinal approach, increase the subject's range of industries included in the study, and use qualitative approaches to further enrich the knowledge.

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Investigating the Weighted Average Lending Rate in Pakistan: A perspective from Three Decades

Abdul Aziz Khan Niazi

Department of Management Sciences, New Campus,
University of Engineering and Technology, Lahore, Pakistan

Tehmina Fiaz Qazi

Hailey College of Banking and Finance
University of the Punjab, Lahore, Pakistan

Suleman Sami Qazi (Corresponding Author)

Department of Electrical Engineering,
University of Engineering and Technology, Lahore, Pakistan

Abstract

The study aims to analyze the average lending rate in Pakistan in the last thirty years. The design of the research embraces the literature survey, review, data assortment, and analysis. Following the deductive approach and positivism as the research philosophy, a wavelet analysis of the secondary data obtained from the central bank of Pakistan for the last thirty years is performed on MatLab. The wavelet transform is one of the popular modern techniques that can capture the movements of variables (i.e. average lending rate in the case in hand) both in time and frequency domains on spectrograms. The results of the analysis provide new insights that have propounding implications for the banking sector, industry, government, policymakers, researchers, and international financial institutions. The study contributes contour diagrams and a lot of supplementary information as food for thought to policymakers.

Introduction

Interest rates popularly known as lending rates in contemporary literature are key to any economy because they directly and indirectly affect voluminous aspects of the economy like: inflation, economic growth, exchange rate stability, savings, and business profit abilities. Khan, & Akhtar, (2024) said that in the long run, an increase in lending interest rates leads to a decrease in lending capacity, and a decrease in lending interest rates has a non-significant impact. Yemidi, Nkansa Asante, & Takyi, (2023) resulted that a regime of moving from a higher to a lower monetary policy rate results in a shift in inflation from a high to low. Kamasa, Afful, & Bentum-Ennin, (2023) argued that the autoregressive distributed lag (ARDL) model revealed that, MPR has a positive significant effect on lending rate in the long and short run the non-linear autoregressive distributed lag (NARDL) model shows other way round. There is a wide range of analysis of a wide variety of economic variables but contrary to the myth that interest rates are crystalized and highly studied area, the authors could not find many of the studies addressing the phenomenon of interest in general lending interest rates in particular. The authors could not find any study concerning that of related to Pakistan. In fact, main stream searches have ignored this phenomenon, therefore, there is a gap in literature to this extent in the context of Pakistan. The objective of the research is to investigate the weighted average lending rates for thirty years in Pakistan. A wide range of methods to achieve study objectives are considered like: Compromised Combined Solution, DEA, FMEA-Model, GRA, Wavelet Analysis, IRP, ISM, LBWA, Multi-Attribute Decision Making, MICMAC analysis, Regression Analysis, TACTIC, Weighted Process Model, etc. like that in Qazi, et al., 2023; Tariq, et al., 2023; Qazi, Niazi, Mirza, Basit, & Saleem, 2023; Farid, et al., 2023; Shaukat, et. al., 2023; Aziz, et al., 2023; Niazi, et al., 2023; Niazi, Saleem, Basit, Iqbal, & Khan, 2023; Niazi, Qazi, Aziz, Basit, & Niazi, 2023; Qazi, Niazi, Mahmood, Basit, & Niazi, 2023; Naeem, Muhammad, & Niazi, 2021; Ali, Mushtaq, Niazi, &

Raza, 2021; Basit, Qazi, & Khan, 2021; Qazi, Niazi, & Basit, 2020; Faraz, Niazi, & Zafar, 2020; Niazi, Qazi, & Basit, 2019; Basit, Niazi, Qazi, & Imtiaz, 2019; Niazi, Qazi, & Basit, 2019; Haq, et al., 2018; and Basit, Qazi, & Niazi, 2020) and wavelet analysis used that being the most appropriate. Wavelet analysis used in wide variety of fields like medicine (Qassim, et al.2013; Hassan, et al. 2010; Scholkmann, & Dommer, 2012), geophysics (Liu, Hsu & Grafarend, 2005; Zamani, Samiee & Kirby, 2013; Grinsted, Moore & Jevrejeva, 2004), astrophysics (Li, Gao & Zhan, 2009; Bloomfield, et al. 2004; Donner & Thiel, 2007; Kelly, et al. 2003) etc. It is also frequently used for research in the field of neuroscience, wind engineering, industrial aerodynamics, finance, biology, medicine, economics, meteorology, energy, computer science, engineering, electronics & telecommunication, management sciences, social sciences, acoustics, geodynamics, laser physics and nuclear science, signal processing, engineering, medical sciences, astronomy, project management, energy, manufacturing, engineering, research and development, insurance, oil & gas, transportation, geology, geo-physics, oceanology, music, and environmental science. The wavelet transform approach was invented to overcome the limitations of the Fourier transform and other econometric models (Crowley & Mayes 2009; Rua & Nunes 2009). Section 2 reviews literature, section 3 is methodology, sections 4 is analysis, results & discussion, and section 5 is conclusions, respectively.

Literature Review

Since the literature reviews provides related information and context for the research problems, therefore, it is considered as necessary part of the research study. A brief literature survey is conducted by exploring Wiley Online Library, Taylor & Francis Online, Springer Link, Emerald Insight, Elsevier (Science Direct), and JStor using keywords weighted average lending rate in Pakistan, lending rates in Pakistan, lending rates, interest rates, interest rates in Pakistan, etc. to set the context of the study. Quite a number of research articles is found and reviewed out of which some relevant studies are reported for the current study. Akbar, Iqbal, & Noor, (2019) asserted that there is the unidirectional causality from the interest rates to the gold prices. Khan, Khan, & Saleem, (2023) argued that there is inverse relationship between monetary policy and the bank lending rates. Orhan, Zaheer, & Kazancı, (2023) concluded that Turkey-based tawarruq platform may be structured instead of applying other modalities in central banking. Ghauri, (2015) bolstered that interest-based benchmarks do not represent real economic activities. Djelassi, & Boukhatem, (2024) emphasized that increasing interest rates reduce loans and conventional deposits. In Islamic banks, deposits are affected by interest rate changes. Mushafiq, & Sehar, (2021) reached to the conclusion that Islamic bank term deposit rates are dependent on conventional bank term deposit rates in the short-term. Perera, Skully, & Wickramanayake, (2010) buttressed that no significant deviations in bank interest margins is attributed to micro credit. Gholipour, Oikarinen, & Tajaddini, (2020) argued that house price appreciations have significant contribution to banks' lending to public sector and not lending to private. Towo, Ishengoma, & Mori, (2022) buttressed that duration of the relationship is negatively and significantly related to Savings and Credit Co-operative Societies (SACCOS) financial performance that substantiates the relationship lending theories. Rosenberg, Gonzalez, & Narain, (2009) reached to the conclusion that the developing and transition economies have engrossed increasingly on making their lending operations financially justifiable through charging interest rates.

Methodology

The study is based on a positivist research philosophy and a deductive research approach. Its overall design is a literature survey, data finding, and analysis. It is a case study that investigates the space and time localization of the weighted average lending rates in Pakistan for thirty years. The secondary data has been obtained from the central bank of Pakistan. Wavelet transform is

used to capture the information on variation in lending rates over different political and crisis regimes. Wavelet has an exceptional potential to capture the non-stationary behavior and time-varying trends present in the time series data (Aloui & Hkiri, 214; Aloui, et al., 2018; Aloui, Hkiri & Nguyen, 2016). The analysis is performed on MatLab software using its in-built wavelet tools. The wavelet methodology has parental authority over other econometric and statistical transformation methods.

Analysis and Results

The study is built on the real-time dataset (Table 1) of weighted average lending rates (outstanding loans) for thirty years in Pakistan. This is the month end average rates data starting from July 31, 2003 to September 30, 2019. It is presented in a skip form for the sake of brevity. The full dataset is with the authors and can be made available.

Table 1: Dataset of Lending Rates in Pakistan

Series Name	Unit	30-Sep-19	31-Aug-19	- -	31-Aug-03	31-Jul-03
Weighted average lending rate - OS	% per annum	12.69	12.37	- -	7.52	7.98

The data is analyzed by using individual wavelet power spectrum transforms using the wavelet toolbox of MatLab. The wavelet transform has parental authority over the other transform analyses like the Fourier transform etc. It enlightens upon the localization of the variations in lending rates in both frequency and time domains over the sample period (July 31, 2003 to September 30, 2019). The Figure 1 is a contour diagram plotted on the x-axis (months/years) and y-axis (frequency) on a Cartesian plane. Whereas, intensity (the third variable) is represented on a color scale (dark blue being a proxy of low intensity to dark red proxy of high intensity). The variations can be seen through color intensity over the sample period contrasting different levels of wavelet frequency.

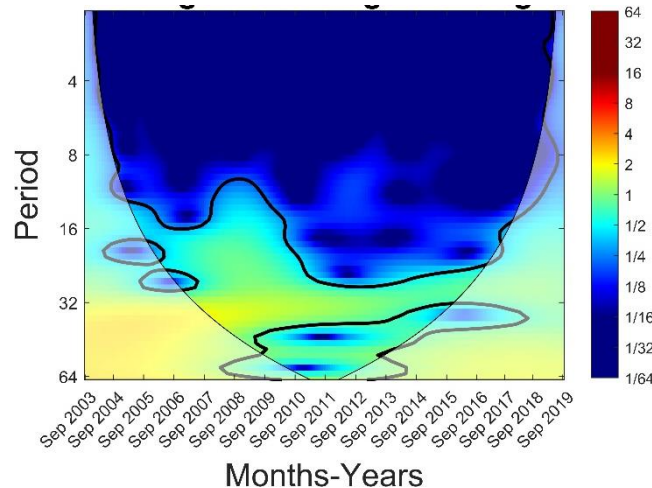


Figure 1: Wavelet Power Spectrum of Wight Average Lending Rates

In Figures 1-6 i.e. wavelet power spectra of variables mentioned in Table 1 above, the color code ranges from dark-blue to dark-red. Dark blue depicts low power, whereas, dark-red depicts high power. One can observe the there are certain areas bounded by thick lines, particularly at high frequency localized at period September 2007 to September 2017 at wavelet frequency of 32-64 showing relatively high intensity. A black thick outline is called a cone of influence (COI) that

encloses regions of 5% cumulative area-wise significance and the area showing edge effects is lightly shaded. This is achieved by generating Monte Carlo simulations surrogate series

Discussion and Conclusion

The interest rate phenomenon is one of the vital variables of any economy and it has a noteworthy relationship with the progress of the economies and businesses of a country. It apparently is high on the research agenda of economists that, in fact, seems myth. Average lending rates in a country can be one of the good gauges to judge the economic condition of a country. Current study is an effort to fill the gap of literature in this regard. The objective of the research is to investigate the weighted average lending rates for thirty years in Pakistan. The results of the study show that there are certain areas bounded by thick lines, particularly at high frequency localized at the period September 2007 to September 2017 at wavelet frequency of 32-64 showing relatively high intensity. The study contributes a wavelet power spectrum of month end average rates data starting from July 31, 2003 to September 30, 2019 to the literature. It has philosophical practical and theoretical inferences. Its findings are useful for individuals, businesses, institutions, and policymakers by presenting unfathomable comprehensions about the phenomenon. It is an initial study by the authors and it has certain limitations. It is subject to all limitations that apply to quantitative time series data and wavelet transform. It is recommended that the future researches should be designed in different context and on longer/larger datasets and also should use all variants of time series transform techniques to overcome the limitations.

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The Impact of Social Media on Consumer Purchase Intentions

Sammar Saddique

BS Management and Technology Department, School of Business and Management,
Information Technology University, Lahore, Pakistan

Dr. Muhammad Adnan Sial

Assistant Professor, UE Business School, Division of Management and Administrative Science,
University of Education, Lahore

Abstract

This research aimed to explore the effect of social media on the purchase process, including the target population of university students. Specifically, the study purpose is to create the moderating effects of personal innovativeness, buying impulse, self-efficiency, attitudes towards online shopping, perceived control behavior, perceived ease of use, and decision-making process in an online shopping context. A cross-sectional quantitative research design was adopted, with data obtained through a convenience sampling technique. The primary data was collected from 102 respondents through Google Forms. The studied hypotheses were tested through PROCESS for SPSS version 27. Buying Impulse was assessed using the Impulse Buying Tendency Scale by Rook (1987). Attitudes toward online Shopping were gauged using a scale adapted from Kim and Stoel (2004). The studied hypotheses were tested, and the relations between the variables were established by employing statistical methods based on the data collected. On this basis, results highlighted that social media considerably affects consumer purchase intention regarding ease of use, perceived attitude towards online buying, and perceived control over the buying process. Other personality factors that impact purchasing include personal innovativeness, which refers to the readiness to adopt new technologies, and the propensity to buy impulse. The findings thus offer relevant implications for marketers and firms interested in university student consumers. The study shows how incorporating social media into the marketing communication framework can help fully capitalize on the opportunity of this influential consumer segment.

Introduction

Social media has thus come as a powerful tool that changed the process of communicating to the consumer and the brands or firms which the consumers normally relate with during the purchase decision. Social media platforms like Facebook, Instagram, or TikTok are considered crucial for marketing, as they enable businesses to make more brand awareness and generate consumer engagement since most targeted users' content is highly personalized (Kaplan & Haenlein, 2010). Thus, emerging as a paramount subject of study is the impact of such networks on consumer behavior while digital adoption is advancing (Mangold & Faulds, 2009).

Research Problem

The application of social media in consumer behavior has been widely explored however; research focusing on combined psychological²⁹³ and technological factors influencing purchase intentions in the social media context is limited. Although the use of platforms, including

Instagram, TikTok, and Facebook has become dominant in e-commerce marketing, there is a lack of effective integration of psychological variables (Personal innovativeness, emotional intelligence, and perceived control) and technology factors (Ease of use, perceived trust) within one unified conceptual model. However, the research on these contingency factors remains limited; for example, personal innovativeness in using IT propelled buying impulse tendencies, and influencer's emotional appeal. Specifically, there appears a research gap on how these factors affect university students' and young professionals' purchase intentions when they encounter social media marketing. These are the most significant groups since those consumers are active social media users, but their reactions to influencer marketing or digital advertisements might not resemble other audiences. This research purpose is to address this gap by examining the relationship between social media marketing activities, psychological constructs (emotional engagement, trust, buying impulse), and technological constructs (ease of use and perceived control) influencing the purchase intentions of consumers. Furthermore, it will also discuss how these factors are influenced by personal innovativeness and emotional intelligence. Therefore, the study's purpose is to explore and analyze methods by which university students and young professionals engage in purchase-related social media marketing to enhance marketers' effectiveness in reaching these audiences.

Research Question

- In what way do Instagram Facebook and TikTok affect the purchase intentions of university students and young professionals? What is the role of social media engagement, user-generated content (UGC), and influencer marketing in shaping purchase intentions?
- How do psychological factors such as personal innovativeness, buying impulse, emotional engagement, and perceived behavioral control influence purchase intentions on social media?
- How do technological factors such as ease of use, perceived trust, and platform architecture impact consumer attitudes and behaviors toward online shopping?

Specific Area of Research

In this research, the moderating role of social media is defined as the opportunity of consumers to interact to purchase or reject a particular product or service based on stimuli (Dodds et al, 1991). This explores the part played by variables like perceived personal innovativeness, perceived attitude toward the innovation, perceived control over its use, buying propensity, and ease of use in determining these intentions. To fill the theoretical gap, the study uses well-defined behavior theories like the Technology Acceptance Model (TAM) (Davis, 1989) and the Theory of Planned Behavior (TPB)(Ajzen, 1991) in light of the dynamic social media environment.

Significance of the Study

In essence, this work poses useful findings not only to theoreticians and scholars but also to businessmen and practitioners. From the theoretical point of view, it helps to develop the knowledge of the psychological and behavioral effects connected with the usage of social media on the decision-making process of consumers. Overall, it is an improvement from current research by making comparisons between the Technology Acceptance Model and the Theory of Planned Behavior while fitting new social media elements into the two models at the same time (Gefen et al., 2003). The contention of the study offers small businesses practical knowledge on how to

create meaningful social media campaigns that will keep consumers engaged and cause them to ultimately buy products online as suggested by Mangold & Faulds in 2009. This research is important when trying to connect the old behavioral models and the new and rapidly developing digital environment.

Motivation of the Study

These platforms including Instagram, TikTok, Facebook, and so on have risen to prominence in recent years demanding social media as a key tool in marketing and customer relationships. University students and young employees as key users of these platforms are vulnerable to both influencers' endorsements and user-generated content. This study seeks to fill this gap by investigating the effect of the following technological aspects such as ease of use and trust on the use of social media marketing, psychological aspects such as personal innovativeness, emotional intelligence, and perceived behavioral control on the purchase intentions of consumers. This research is carried out with the intention to fill this knowledge gap such that marketers can be equipped with better dynamics to work with. Therefore, this research seeks to help marketers and various businesses understand some aspects that can be adopted in order to improve the consumer use of social media platforms in the resulting e-commerce purchasing decisions.

Literature Review

Social networks have changed every aspect regarding the consumption and acquisition of products among consumers. This way, the big gap that exists between the brands and consumers is closed through intermediaries such as Instagram, TikTok, or YouTube influencers. This paper aims to examine the moderating relationships between technological factors, psychological factors, and behavior. The research variables studied for the first time include personal innovativeness in IT, perceived buying impulse, perceived attitudes, and perceived behavioral control. New variables like perceived trust, perceived risk, emotional NI, and brand loyalty are added to take the discussion forward. These variables are also depicted to show the interconnection of the variables about online purchase intentions.

1. Personal Innovativeness in IT

The self-directed IT factor concerns the individual capacity for learning and the readiness of an individual to use new developments in the information technology field. Experimentation has been a major force guiding early adopters and thus are highly sensitive to innovative marketing tactics used in social media. Amending Agarwal and Prasad's (1998) work, craziness concerning influencer content is higher among innovativeness users, which complements the opinion of Peña-García et al. (2020) that untamed innovativeness influences online buying behaviors. This variable shall provide the framework of new marketing communication methods' influence on the technologically enhanced customer.

1.1. Emotional Intelligence (EI)

Self and Other's Emotional Intelligence (EI) can be defined as the skills of a person that enable him to monitor and regulate emotions within and outside himself. Research has demonstrated that EI affects consumers' buying decisions, particularly regarding social media marketing. Wang and Shu (2021) reveal that social media consumers with high E. I am sensitive to the appeal to emotion in social media advertising appeals. As a result of empathy or excitement, fans can form better

relational appeals with the influencers; hence, triggering purchase intentions. In addition, people with a greater level of EI receive clear legitimate messages and are not likely to be tricked by trickery that simply makes them purchase products they never wanted (Mayer, Salovey, & Caruso, 2004). Looking into the effects of social media in particular, it is important to note that influencers by default adopt the social appeal and rely on feelings. For instance, beauty KOLs may post a story about how she/he overcame the issue with self-esteem, such testimonial appeals to the emotional schemas of consumers making engagement as well as purchase intentions higher (Grewal, Roggeveen, & Nordfält, 2017). As a result, emotional intelligence has a wide impact on consumers and their susceptibility to actualized emotional marketing tools and subsequent purchasing decisions.

2. Buying Impulse

Impulsive purchase on the other hand is otherwise known as technically a decision made without much thinking, and that includes actions such as being influenced by beauty appeal, time pressure, and social pressure. Social networks are rather successful in developing and strengthening impulsive buying behavior due to the timely and relevant special offers or targeted usefulness of a certain product or a brand endorsed by a popular influencer – the Two-Way Intervention creates enthusiasm and scarcity (Chen & Lin, 2019). The depiction of products boosts their appeal, more so when depicted on social platforms such as Instagram; similarly, influencer reliability raises the appeal of products making followers make impulsive purchases. Fear of missing out often in the social media posts and experiences by influencers, coupled with the limited offers or a countdown timer for purchasing along with the scarcity effect (Lichtenstein et al., 1990) also provokes impulse purchase decisions. Another closely related factor is the influence trust, in this case, consumers are more likely to act based on influencers' suggestions if they know them personally and trust them (De Veirman et al., 2017). These dynamics are supplemented by the Social Proof mechanism under which consumers tend to imitate the buying behavior of other consumers, primarily those they respect. As a result, influencer marketing is applied by brands as a tool to induce impulse buying behavior: either using the emotional part of the buyer's decision or just focusing on the social aspect and the tendency of a consumer to make a purchase immediately (Kim & Ko, 2010).

2.1. Social Proof

It is a phenomenon whereby an individual is inclined towards a behavior that is consistent with others who are doing similar. It is a kind of obedience and has been effectively applied in approaches to digital marketing, with references to the use of social networks. Seligman (1991) suggested that social proof greatly influences consumer behavior especially when people are indecisive or in a state of knowledge deficit, This premise was underlined by Cialdini (2001). Media that are popular today such as Instagram and TikTok rely on this by posting icons like likes, shares, and comments to show the popularity of a product. This is a claim that one is always more likely to decide to buy something if he or she has that person who he or she admires or a person who is in the same social group as himself or herself endorsing the product in question. For instance, in the case of influencers, if the influencers are active in sharing their post regarding a specific product and if the audience is highly interactive, then the consumers are likely to believe in the product value and are to buy the product (Fournier & Avery, 2011). This is well highlighted by social media marketing strategy where endorsements from opinion leaders cause high changes in product usage (Huang & Benyoucef, 2013).

2.2. Perceived Value

Perceived value is the consumer value of a product regarding the perceived benefits that consumer is willing to pay for. They are typically important in influencing whether a consumer will finalize the purchase or not. On this aspect, SMM usually raises item awareness, showing features, others' and own use experiences as a way of raising perceived value. Thus, social media influencers are valuable in increasing perceived value since they show how products can be used and light up benefits that are appealing to the target audience. Perceived value according to Zeithaml (1988) refers to the consumer's net evaluation of the benefits and sacrifices associated with the purchase of a product. Hello, to shine additional light on the points made, here are the added benefits that influencers deliver: Influencers repeatedly try to generate a feeling of scarcity (special offer available for a limited time only, special promotion) to the product, which makes the product more valuable and attracts impulse buys (Kim & Ko, 2012). As the perceived value is enhanced it increases the chances that the consumer will convert.

3. Self-Efficacy

It is an individual's confidence level in the use of Internet tools relating to the purchase of goods. Consumers with self-perceived technological competence are more likely to interact with influencers' recommendations. Bandura has mentioned that self-efficacy is closely associated with decision-making, especially in areas such as new technology. Subsequent research (e.g. Bratkov, 2024) has supported this by showing that high self-efficacy reduces delay, enhances the perceived credibility of e-commerce, and leads to purchasing.

3.1. Digital Literacy and Its Role in Decision-Making

Digital literacy is defined as the competencies needed to locate, assess, and share information through the use of technology. Thus the general use, experience, or 'savviness' of consumers to online forums or environments is likely to determine their standings in appreciating the information given online. In the context of social media marketing, digital literacy determines consumer engagement with digital content such as advertisements and posts from social media influencers. According to Van Deursen and Van Dijk (2014) digital literacy helps consumers establish authority in product information hence improving their purchasing confidence. Further, digitally smart customers do not get easily trapped in scams and deceptive messages, which differentiate between a recommendation message from an influencer and an advertisement (Hargittai, 2010). On the other hand, the audience with lower levels of computer literacy is more likely to be deceived by manipulative advertising that diminishes their knowledge and makes them easily pressured into making an impulsive decision to make the purchase.

3.2. Gamification

Gamification is the concepts in spheres different from playing games, as an approach to influence consumer behavior. In social media marketing, gamification is best expressed in elements such as interactive elements or a rewarding system added to a competition feature. Leveraging the give-or-take technique, social media influencers incorporate game characteristics into their followers' buying behaviors. Hamari et al (2014) opine that gamification has been established to enhance user engagement thereby enhancing consumers' buying intentions. When users are participating in a game or challenge, they feel complete when the tasks are done, which links directly to brand loyalty and product purchasing. This brought into perspective whereby on applications such as Instagram, TikTok or Snapchat influencers utilize gamified experiences to

enhance creativity in their posts and urge consumers to make purchases (Hamari, Koivisto, & Sarsa, 2014).

3.3. User-Generated Content (UGC) and Co-Creation

Consumers themselves generate user-generated content, which may be in the form of images or videos of their interaction with a product. UGC is more credible than other forms of advertising because consumers trust their fellow consumers. According to Schivinski and Dabrowski (2016), brand equity and consumers' purchase intentions are functions of UGC. UGC in turn gets extended by these individuals into their stories and consequently, the legitimacy of UGC is increased. Also, pro-activity whereby brands allow consumers to participate in product development or a marketing campaign enhances emotion and loyalty.

3.4. Personalization and Consumer Satisfaction

Personalization entails using a customer's preferences when delivering their marketing information to make the consumer feel valued. Popular social media platforms use relevant algorithms to study user activities to make relevant suggestions. In this regard, Montgomery and Chester (2009) posit that consistent, relevant, and fascinating messages show that customers appreciate personalization and sales promotion create an enjoyable buying experience. Personalization is also employed by influencers through referring to their fans- making the association feel private.

4. Ease of Use

Convenience assesses how easily consumers can shop online and purchase products from Internet stores. Sometimes it is also noted that platforms that are marketed through influencers are characterized by their simple layout of the consumer funnel. Measures of efficacy were found by Davis (1989) in his Technology Acceptance Model stating that perceived usefulness was the primary driver of technology uptake influenced by perceived ease of use. This concept still has specific relevance in e-commerce cases, the example of which is discussed by Peña-García et al. (2020), who pointed out a clear connection between easy-to-use interfaces and higher willingness to buy.

5. Attitudes Toward Online Shopping and the Role of Influencers

Perceptions associated with purchasing behavior resulting from online shopping are convenience, reliability, and shopping experience. These attitudes greatly determine if consumers are going to shop online or otherwise. It has been rightly concluded that perceptions of ease of use and satisfaction play an important role in the prediction of purchase intentions (Davis, 1989). These are some of the reasons why marketers believe that consumers with positive attitudes towards online shopping are likely to consider the activity as convenient, reliable, and a satisfying activity to engage in resulting in more likelihood of consumers making purchases on the internet (Baker et al., 2007). Nevertheless, we cannot deny the fact that the various factors that can have an impact on attitudes are indeed social influence, past experiences, but most of all the influence of key opinion leaders specifically on the influence of the World Wide Web.

Opinions of online influencers regarded by consumers as trustworthy, familiar, and credible together with the experience of relevant personalities play a crucial role in developing the consumers' attitudes to online purchases. Influencers are involved with the audience because the product is advocated simply and entertainingly, which creates a positive attitude toward recommended brands. A study conducted by Hudders et al. (2021) recognized that as you can see, influencers' recommendation, especially when presented in a way that is asserted to be real and personalized, positively influences consumer behaviors toward online shopping. The consumer builds a VIP relationship with an influencer instead of an advertisement; they are more likely to believe a fellow consumer who has gained influential status due to their popularity.

Mainolfi et al. (2023) also went further to note that perceived authenticity makes a very important contribution towards promoting these sorts of positive attitudes. There is always a greater audience reception when the influencers are promoting the material well in a manner that is consistent with the image they portray. Such a perception of authenticity enhances consumer confidence by minimizing skepticism about the actual online shopping process. It gives the consumers an impression that they are in control of the information they receive from other sources rather than being manipulated (Lorenzo-Romero et al., 2014). It also showed that the higher the perceived similarity of the influencer with consumers, the results linked with the better evaluation of the shopping experience and the brand being endorsed, which in turn, led to a higher purchase intent.

The relationship between influencer and consumer pertains to social actor influencers and is mediated by attitudes toward online shopping and the increased role of UGC. A proportionate sample shows that consumers use reviews, ratings, and posts on social media influencers as a source of information when making a purchase. When people receive positive attitudinal communications from their peers or opinion leaders whom they trust, not only do they develop more favorable attitudes towards the particular product but their perception of those online shopping platforms also turns out to be favorable (Cheung & Thadani, 2012). For instance, writing about their own experiences regarding a product influences consumers to make a purchase of a certain product because it eliminates the perceived risks of purchasing certain products online.

As for the marketing strategies, integrated appeal of influencer to increase the attitudes toward online shopping has highly influenced it. If companies select influential figures who have similar overall attitudes as those of the targeted audience, they are more likely to achieve more positive consumer attitudes, which will lead, in turn to increased attention and purchases (Freberg et al., 2011). Such partnerships build on the consumer trust that consumer has with an influencer and translates to ensure that the consumer becomes more loyal to the influencer as well as the endorsed product.

Apart from consumer characteristics, attitudes towards online shopping go beyond this because they are influential in overall marketing initiatives as well. Several positive attitudes lead to higher chances of purchasing the same brand again since satisfied customers recommend its use to others and brand perceptions are also highly likely to improve (Ajzen, 1991). Thus, positive attitudes towards online shopping behaviour change as a result of influencer marketing benefits not only a business organisation at the present but also in the future.

6. Perceived Behavioral Control

Attitude is an assessment of another's behaviors, perceived behavioral control is the consumers' perception towards the availability and use of the resources and knowledge needed in online

shopping. Referring to Ajzen's (1991) Theory of Planned Behavior (TPB), this variable is crucial in working on intentions. Other scholars (e.g. Taylor & Todd, 1995) have built on this framework indicating that the influencers help to reduce decision making ambiguity because they assist in offering clear instructive suggestions to the decision makers thereby increasing perceived control.

6.1. Perceived Trust

Trust perception is a central determinant of consumer behavior especially in a virtual world with reference to influencer marketing. The extent to which the consumer trusts the influencer and the brand associated with the influencer determines the consumer's decisions to buy a product. According to De Veirman et al. (2017), perceived trust fully mediates the relationship between perceived credibility of the influencer and purchase intention of the consumer. This means that whenever consumers have confidence in the influencer endorsing the product, chances of buying the product becomes high because of the assurance in quality of the product.

This also alleviates perceived risks, a key concern in e-commerce related environment. As stated by Kim et al. (2008) consumers consider perceived risks whereby risks associated with online shopping include; payment security, quality of products, and fraud. However, when consumers follow an influencer, they are confident in the worth of the product or service the influencer is advertising. That is why when trust minimizes these risks, the likelihood of taking decisions which results in a purchase is desirable. This is important to help brands and influencer believe that the consumers are willing to pursue them in the long run for more of those products since they are trusting in the brand or influencer in question. Jiang et al. (2021)'s study also supports this argument stating that trust in the post by the social media influencer influences the consumers 'attitude towards the advertised brand.

6.2. Perceived Risk

Pseudo risk is an important factor that influences online consumer behavior. It relates to the customer's apprehensions which may occur during the process of buying a product over the Internet – apprehensions concerning data security or the bona fide nature of sellers or the dependability of the site. The findings also showed that perceived risk negatively relates to the purchase intention which supports the conclusion of Bhatnagar et al. (2000). In other words, the actual risk to a consumer is inversely proportional to the consumer's probability of purchasing a product. This emphasise some measures that exist with the view of lowering perceived risk that affect online consumers.

Over the future scope of social media and influencer marketing, influencers specifically have the capacity to mitigate perceived risk since they help as middlemen between the buyer and seller. To manage risk, Sharma et al. (2021) note that influencers help by providing the truth about a product based on their experiences and using genuine products to endorse them. Consumers usually use influencers to provide genuine opinions since it influences their confidence on the advertised products. Therefore, whenever handsome influencer recommend what should be labelled 'their' products, it gives a nod to brand credibility, and gets rid of perceived risk that would have kept a consumer from buying.

6.3. Emotional Engagement

Emotional involvement is a term extended to the level of engagement which consumer has towards the information shared by the influencer. This emotional connection can help to better

memorize brand name and make a consumer more likely to return to this brand again. Hudders et al. (2021) proved that, consumers retain and interpret products that create an emotional appeal better, when narrated in emotionally appealing material. Consumers are likely to connect with the brand or product advertised by an influencer if they are induced with positive emotions such as excitement, joy or Empathy during the process of the endorsement.

Emotional involvement requires deposits of key buying motivators as well as elicits the buying impulses. Conducted by McKinsey & Company in 2020, the type of emotional bond that people have with a particular brand significantly affects their behaviour. Whenever consumers become emotionally committed to the content of the message or the story being portrayed by the influencer, they are likely to be influenced to make impulsive purchases. Additionally, emotional connection is a more sustainable way of achieving consumer commitment than, for instance, the classic association of a product with functionality and need, because customers are not only obtaining tangible products, they are developing feelings for the brand. This link bundles up over time and results in repeat patronage and word of mouth publicity.

6.4. Brand Loyalty

Brand loyalty in this context can be described as the consumer's ability to continue sticking to a certain brand when making his or her purchase. In the case of influencer marketing, customer loyalty is defined by experiences and bond with brands on both, the rational as well as the emotional level. According to Chu and Kim (2011), it can be assumed that highly committed brand devotees will be more receptive to influencer suggestions. This is particularly vital given that more often, the audience perceives the influencer as a reliable source of recommendations, and they can increase consumers' loyalty to the brand. Regular clients normally have complex psychological contacts with the products, and therefore, they will most likely respond well to influencers' recommendations.

This means that it will be extremely useful to recapture the effect of the endorsement (control variable) in making sure that there is continuous intention to purchase a particular brand. In this way, people as the permanent audience and supporters of an influencer, they become devoted customers to the brand, making more purchases. In addition, those consumers who bounce with the firm and are willing to continue to purchase from it are likely to recommend the firm's brands to their friends and other consumers in a social system thus patronage the firm. Therefore, influencers play a role of nurturing and reminding consumers of their commitment to a specific brand, and hence enhance future purchase behaviors (Keller, 2016).

7. Online Purchase Intention

In the context of this research, online purchase intention refers to the consumers' attitude towards making a purchase using the internet. That is the main reason why this behavior is regulated by several factors such as trust, emotions, perceived risk and brand effects. Thus, according to Bratkov (2024), trust in the influencer and positive affective response towards brand message also have monumental importance for predicting the online purchase behavior. When they trust the credibility of an influencer, and or when the consumer has positive emotions associated with the brand, they will be able to order online.

Furthermore, the relationship between trust and emotional engagement with purchase intention was supported by prior researchers that explored the fact that acquiring a high level of emotional appeal on brand enhances the chance of buying³⁰ (Grewal et al., 2017). Consumers also buy the product if risks are perceived to be low and there is already brand switch consumer loyalty.

Purchasing intention in cyberspace may consequently be viewed as the final process result of the interactions between the psychological and emotional characteristics identified in the sections above.

9. Conclusion

This paper also found that the interpersonal and situational factors greatly shape the online purchase intentions of consumers. Technological elements include innovation adoption, perceived ease of use, and perceived self-efficacy; and psychological factors encompass trust, hedonic angles, and perceived risk. Social media influencers are the middle links that connect these factors and trigger consumers' actions.

This integrated approach points that the strategy makers should consider many factors while formulating the marketing strategies—reflecting both cognitive and affective motives of consumers. The dynamic of influencer marketing can also be examined in future research to identify the possibilities of permanently tying the customers to the brand.

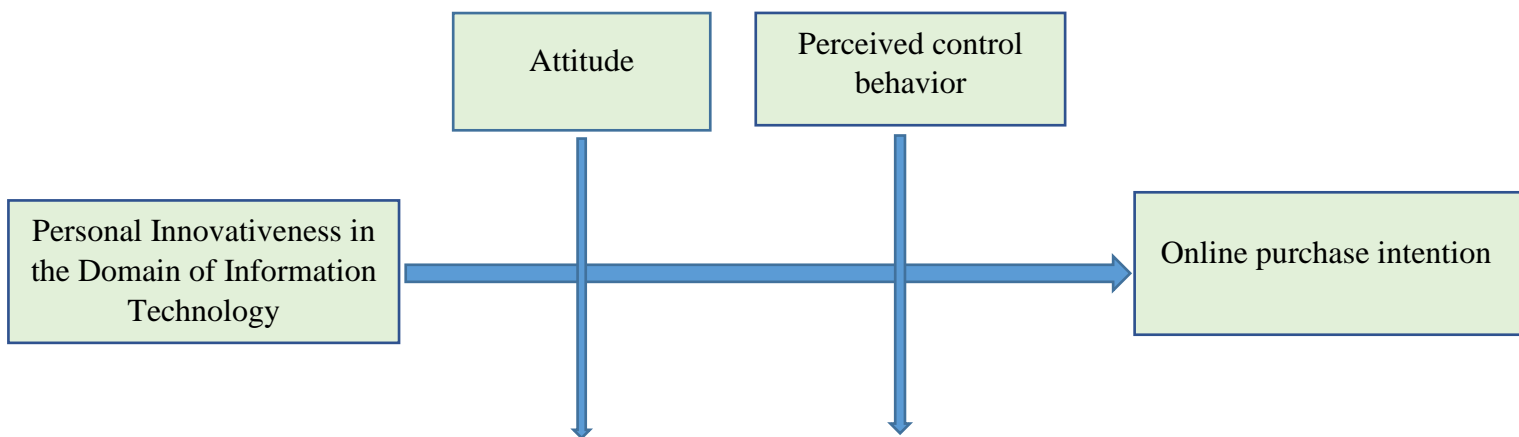


Figure 1: Schematic Diagram of Study

Hypotheses

H1: Social media engagement (Instagram, Facebook, and TikTok) positively influences consumer purchase intentions.

Social media platforms, through engagement and interaction with brands, are expected to impact consumer attitudes and increase purchase intentions.

H2: Personal innovativeness in IT moderates the relationship between social media engagement and consumer purchase intention.

Consumers who are more innovative in their use of technology are likely to be more influenced by social media marketing tactics, affecting their purchase decisions.

H3: Emotional engagement with social media content positively influences purchase intentions.

Emotional connections fostered through social media content (like influencer marketing) can lead to stronger purchase intentions.

H4: Perceived ease of use of social media platforms positively influences purchase intentions.

Platforms that are perceived as easy to navigate and engaging may lead to higher purchase intentions.

H5: Perceived trust in social media influencers positively impacts purchase intentions.

Trust in influencers' recommendations is crucial for consumers, particularly in the context of product endorsements on social media.

H6: Social media marketing positively affects brand awareness and purchase intentions.

Rationale: Effective social media marketing strategies lead to better brand recognition and influence purchase behavior.

H7: People with privacy concerns, product quality have perceived risk which reduces the effects of social media engagement on consumer purchase intention.

Consumers who perceive higher risks (e.g., privacy concerns, product quality) may have lower purchase intentions, even when engaged with social media content.

H8: Perceived control over online shopping (self-efficacy) positively affects consumer purchase intentions via social media.

Consumers who feel they have control over their online shopping process are more likely to make a purchase after engaging with social media.

H9: Information overload negatively affects the relationship between social media content exposure and purchase intentions.

Too much information can lead to confusion or fatigue, reducing the likelihood of making a purchase.

H10: Subjective norms (influenced by peers and influencers) positively influence consumer purchase intentions on social media platforms.

Social influence from peers and influencers on ³⁰³social media can shape consumer attitudes and affect purchasing decisions.

Methodology

Research Design

This research work expressly adopted a quantitative descriptive research approach. The foregoing design was aimed at capturing and putting into figures various demographic and job-related variables of the population of samples. The very design enabled the gathering of structured data more details of the quality data were subjected to descriptive analysis using the Statistical Package for the Social Sciences, SPSS, which included frequencies and percentages. The descriptive research design was used because it aims to paint a clear and vivid picture of the nature of the characters and trends in the sample.

Population

The target of this population was any candidate of the working age and who is either in employment or in the job-seeking pool. Targets for the study include respondents of all years starting from college level, across employment experience and marriage status. The samples for the data came from the population that has variation in age, gender, and experiences in employment.

Sample Strategy and Size

In total, 102 participants for this study were chosen with a convenience sampling approach. This method was used because of its applicability and accessibility for the target respondents within the set time. The sample included 65 males (63.7%) and 32 females (31.4%), with age distributions as follows: Under 18 years 6.9%, 19-25 years 75.5%, 25-30 years 13.7% and above 30 years and above 3.9%. The job experience levels included Less than 1 year (65.7%), one to three years (17.6%), three to five years (8.8%), three to five years (9%), and over five years (7.8%).

Inclusion Exclusion Criteria

The inclusion criteria for the study required participants to be:

College students at least. People working or looking for a job within the months prior to the survey interview. Excluded from the study or have a mental illness or other conditions that could affect the results of the study Willing to participate in the study voluntarily and share demographic and professional data.

Exclusion criteria included

People under College level and of age.

Refusers are people who cannot fill out the questionnaire or are reluctant to divulge basic demographic information. The subjects attempted to give half-baked, inconsistent responses.

Unit of Analysis

This research focuses on individual level consumers, particularly, university students and young working population in the age range of 18-30 and active on Instagram, Facebook or TikTok. They are people belonging to the category of social media users actively involved in the digital space. This paper explores their behaviour, perceived attitude and psychological disposition including, but not limited to, their buying impulse, emotional attachment and personal innovativeness towards internet purchase disposition. It also encompasses the intervention of the social media features; UGC, influencer marketing, structure of the platforms, advertisement, moderating roles; age, affluence, and lifestyle, among others.

Instrumentation

Samples were targeted and administered a structured questionnaire which included demographic information (gender, age, marital status) and job-related information (job experience category). Actually, the instrument was pre-tested with a small group, which checked for clarity and reliability of the test. For descriptive statistical analysis, questionnaire items were developed to match each of the research objectives.

DATA ANALYSIS

Table 1 **Demography**

		Number	%
Gender	Male	65	63.7%
	Female	32	31.4
	Prefer not to say	5	4.9%
	Total	102	100%
Age	Under 18	7	6.9%
	19-25	77	75.5%
	25-30	14	13.7%
	30-above	4	3.9%
Total		102	100%
Martial status	Single	65	63.7%
	Married	26	25.5%
	Unmarried	11	10.8%
	Divorced	0	
	Widowed	0	
Total		102	100%
Job Exp	Less than 1 year	67	65.7%
	1 to 3 years	18	17.6%
	3 to 5 years	9	8.8%
	More than 5	8	7.8%
Total		102	100%

Referring to Table 1, the majority of the respondents were male (N = 65, 63.7%). Respondents from the age group 30 and above were almost absent with N = 4 (3.9%). Whereas, majority of the respondents were between 19 and 25 years of age, i.e. n = 77 (75.5%). Table 1 also indicates that majority of the respondents were single (N = 65, 63.7%). Table 1 indicates that based on demographic factors the sample extracted was the true representative of the studied population.

Reliability Analysis

Variables	Cronbach's Alpha	No of Items
Personal Innovativeness in the Domain of Information Technology	.938	3
Attitude	.858	3
Perceived control behavior	.918	3
Online purchase intention	.886	3

Referring to Table 2 the data is reliable for each of the items at Cronbach's $\alpha > .6$ and this is according to the understanding given by Nunnally (1978). It is pertinent to mention that I deleted item PII4 to improve the reliability of the data. Thus, it is concluded that the data is reliable for further analysis.

Model : 3

Y : OPI

X : PII

W : AT

Z : PCB

Sample

Size: 102

OUTCOME:

OPI

Model Summarization

R	R-sq	MSE	F	df1	³⁰⁶ df2	p
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.7793 .6074 .4429 20.7718 7.0000 94.0000 .0000

Model

	coeff	se	t	p	LLCI	ULCI
constant	-1.5801	1.6699	-.9463	.3464	-4.8957	1.7355
PII	.5698	.5018	1.1356	.2590	-.4265	1.5661
AT	.6400	.6059	1.0563	.2936	-.5631	1.8431
Int_1	-.0947	.1652	-.5731	.5679	-.4227	.2333
PCB	1.6401	.7410	2.2132	.0293	.1687	3.1114
Int_2	-.2857	.2039	-1.4010	.1645	-.6906	.1192
Int_3	-.2247	.1878	-1.1964	.2346	-.5977	.1482
Int_4	.0595	.0509	1.1704	.2448	-.0415	.1605

Product terms key:

Int_1 : PII x AT
Int_2 : PII x PCB
Int_3 : AT x PCB
Int_4 : PII x AT x PCB

Covariance matrix of regression parameter estimates:

	constant	PII	AT	Int_1	PCB	Int_2	Int_3	Int_4
constant	2.7885	-.7501	-.8238	.2174	-1.0372	.2731	.2787	-.0726
PII	-.7501	.2518	.2149	-.0692	.2682	-.0859	-.0709	.0222
AT	-.8238	.2149	.3672	-.0933	.2302	-.0603	-.0941	.0240
Int_1	.2174	-.0692	-.0933	.0273	-.0598	.0193	.0237	-.0070
PCB	-1.0372	.2682	.2302	-.0598	.5491	-.1402	-.1231	.0314
Int_2	.2731	-.0859	-.0603	.0193	-.1402	.0416	.0313	-.0093
Int_3	.2787	-.0709	-.0941	.0237	-.1231	.0313	.0353	-.0089
Int_4	-.0726	.0222	.0240	-.0070	.0314	-.0093	-.0089	.0026

Data for visualizing the conditional effect of the focal predictor:

Paste text below into a SPSS syntax window and execute to produce plot.

DATA LIST FREE/

PII AT PCB OPI .

BEGIN DATA.

2.0000	3.3333	3.0000	3.2109
4.0000	3.3333	3.0000	3.1955
4.3333	3.3333	3.0000	3.1929
2.0000	3.3333	4.0000	3.9272
4.0000	3.3333	4.0000	3.7373
4.3333	3.3333	4.0000	3.7056
2.0000	3.3333	5.0000	4.6436
4.0000	3.3333	5.0000	4.2790
4.3333	3.3333	5.0000	4.2183
2.0000	4.3333	3.0000	3.3445
4.0000	4.3333	3.0000	3.4969
4.3333	4.3333	3.0000	3.5223
2.0000	4.3333	4.0000	3.9552
4.0000	4.3333	4.0000	4.0520
4.3333	4.3333	4.0000	4.0682
2.0000	4.3333	5.0000	4.5658
4.0000	4.3333	5.0000	4.6071
4.3333	4.3333	5.0000	4.6140
2.0000	5.0000	3.0000	3.4336
4.0000	5.0000	3.0000	3.6978
4.3333	5.0000	3.0000	3.7419
2.0000	5.0000	4.0000	3.9738
4.0000	5.0000	4.0000	4.2618
4.3333	5.0000	4.0000	4.3099
2.0000	5.0000	5.0000	4.5140

4.0000 5.0000 5.0000 4.8259

4.3333 5.0000 5.0000 4.8779

END DATA.

GRAPH/SCATTERPLOT=

PII WITH OPI BY AT /PANEL ROWVAR= PCB.

----- END MATRIX -----

Discussion

The purpose of this research was to investigate the impact of social media specifically Instagram, Facebook, and TikTok brands on consumer intent to purchase. The implications of the findings are discussed on the effects of Engagement Behaviors, Emotional Connection with Influencers, perceived usability, and trust acting as the moderating factors between Social media marketing activities and the consumer's propensity to consume. The study also established relevant moderation variables including personal innovativeness in IT, and Students and working professionals' financial and lifestyles. These aspects were important especially when seeking to know the various segments' use of social media platforms regarding purchase behaviour. The findings further stressed the given fact that the engagement of consumers through social media has a large influence on the buying decision of a customer. Consistent with measures identified in prior literature (Grewal et al., 2017), micro engagement, concerning liking, commenting, and sharing in social networks, has a positive impact on brand attitudes and purchase intentions. Such engagement develops positive emotional associations with brands, thus leading to trust and hence brand loyalty (Hudson et al., 2016). It is noteworthy that perceived effectiveness of post use and emotional engagement with influencers was identified as the main theme in the research. Those consumers who experienced emotions in touch with influencers also exhibited higher levels of trust with the products they recommended for purchase, leading to higher purchase intentions (Wang & Shu, 2021; Grewal et al., 2017). Such a conclusion complements preceding studies that argue that emotional bonds play a crucial role in the process of consumers' decision-making.

Interpretation of Findings

This paper aimed at testing the relationship between social media engagement and consumer purchase intentions while controlling for personal innovativeness, emotional engagement, ease of use and trust in influencers. The findings reveal significant insights into how these factors influence online consumer behavior:

H1: Social media engagement (Instagram, Facebook, and TikTok) positively influences consumer purchase intentions.

The findings reveal that interaction with brands on the social media networks like Instagram, Facebook, Tik Tok etc. helps boost the consumer's buying intentions ten fold. Liking posts, sharing posts, commenting on posts and even engaging with brand posts helps establish a relationship of trust. These interactions also improve the perception of brands and foster consumer engagement and hence leading to a better purchase consideration. These results

conform to those of a similar study by Hudders et al (2021) where interacting with the content promotes a favorable perception of brands and increases purchase intention.

H2: Personal innovativeness in IT moderates the relationship between social media engagement and consumer purchase intentions.

This means that personal innovativeness in IT highly mediate the relationship between social media engagement and purchase intention. The degree of consumers' readiness to adopt novel technologies defines their sensitivity to innovative approaches to social media marketing. For instance, such people are more inclined to use innovations, including live shopping, augmented reality when previewing products, and conveying personal purchase intentions through voting through polls. This is in support of the findings of Agarwal and Prasad (1998) who pointed out that personal innovativeness was a significant determinant the effects of new technologies on consumers in the decision making process.

H3: Emotional engagement with social media content positively influences purchase intentions.

The outcomes reveal that emotionally experienced content on social media and – more specifically – influencer marketing matter significantly for purchase intentions. The audience that forms an emotional bond with content, a personal story of an influencer or an inspiring picture, or a motivating brand's message, tend to be loyal buyers. Thus, returning the focus on consumers and enforcing engagement in the creation of content contributes to making the connection emotionally sound and build confidence. This work supports previous research by Wang and Shu (2021) capturing emotional engagement as a strong motivating force when consumers are using social media platforms.

H4: Perceived ease of use of social media platforms positively influences purchase intentions.

This paper shows that there is a particularly strong association between ease of use and the intention to purchase. Customers are willing to interact with brands whose platforms have easy to navigate interfaces, stable shopping carts, and simple layouts. For instance, elements such as one-PC check out, easy and concise product information, and linked payments diminish complexity and increase consumer trust in the purchase process. Based on the research, the following conclusions can be derived, that are in accordance with Technology Acceptance Model (TAM) put forward by Davis (1989) which states that perceived ease of the use is central to technology acceptance and subsequent behaviours in the online environment such as online purchases.

H5: Perceived trust in social media influencers positively impacts purchase intentions.

The results presented here are in line with the hypothesis that perceived trust in social media influencers influences purchase intentions. This means that, even the consumers that may perceive the influencers as being credible, authentic and with a considerable knowledge in the affairs they are talking about are more likely to be influenced to take an action as encouraged by the influencers. People generally feel less threatened to shop online when they trust an online merchant or a website for purchasing products. The recommendations eliminate risks by offering a sense of persuasion and reliability since they bear the colors of influencer, consumer, and product. In view of the above discourse, this particular finding is consistent with the study conducted by De Veirman et al (2017) about the trustworthiness of influencers and its impact on the buying behaviour trends of consumers.

In this respect, the findings related to this investigation are consistent with and complement the literature the field of social media involvement and consumer psychology. Stating that an active engagement with brands on social media improves consumer attitudes and purchase intentions, Kim and Ko (2012) This finding is supported in this study. However, this study is novel in attempting to explore the effects of three platforms – Instagram, Facebook and TikTok and outlines the contribution of each in relation to consumer behavior. Moreover, building on Agarwal and Prasad (1998) moderated model, the current study investigates how personal innovativeness in IT makes a consumer more receptive to social media marketing. In this paper, an extension of Wang and Shu (2021), the importance of emotional appeal is extended further by highlighting the impact of managers adopting influencer marketing to connect on an emotional level that ultimately results in increased purchase intentions. Further, the results of perceived usefulness are inline with TAM while identifying the ease of use characteristics of the platform with the actual consumer purchase behaviour. It also extends De Veirman et al.'s (2017) identification of influencer trust by demonstrating its impact on perceived risk and the consequent boost provided to the confidence in the purchase. In summary, this research combines well-tested theories: Theory of Planned Behavior (Ajzen, 1991) with new knowledge about SNS platforms to enhance existing theories that investigate psychological and technological characteristics in consumers' decision making on the internet.

Limitation

Nevertheless, some limitations can be highlighted, which refers to this study of the influence of social media on the consumer's purchasing intention. First, there is control over sampling and using convenient samples and a relatively small number of students ($n = 100$) greatly reduces external validity. Since the sample depends mostly on university students and youths and young working classes, we might fail to test the paradigm on diverse consumers who cut across different age groups or those with low levels of computer literacy. Second, the response to the survey questionnaires is self-reported, in which social desirability bias and issue of recall influence the authenticity of the results. Third, the research design of the study is cross-sectional, which means that it only captures the state of consumers from two distinct time points, it is not possible to establish a causal relationship, or even to directly consider ongoing advances in social media and the evolution of consumers. Furthermore, this method may present a respondents' sample that reflects individuals more active on the internet and, specifically, social networks, excluding less active ones. Finally, since the speed at which social media platforms and trends are emerging, some findings may lack generalisability entirely due to the dynamic consumer behavior and features offered by many social media platforms. Future research should overcome these shortcomings by using appropriate larger samples, a more diverse population, and longitudinal research design along with the methods that has less self-reporting bias than the ones used in this study.

Conclusion

This research contribute to the understanding of the impact that social media have on consumers' purchasing behavior with emphasized students and working population's engagement with the media. What the study also shows is how activities like SMM, influencer marketing, UGC, and TAD affect the behavior of buyers. As well as increasing brand awareness, social media increases opportunities for emotional bonding and credibility, which are essential drivers of purchase consideration. However, the paper also exposes some important issue among them significances and values of assorted kinds of social media are diverse among each segments especially students since their purchasing powers are dissimilar from the working citizens the result of financial

exigency and lifestyle differences. Furthermore, they have pointed out the samples' limitations, small in size, sources of data involving bias, self-reported information, and with emphasis on online data collection indicates this research result might not be an adequate reflection of the overall consumer population. Nevertheless, the study has aspirations that provide a more profound understanding of how and what businesses can achieve with social media platforms in targeting specific segments of consumers. It raises awareness about customer behavior in the age of the digital world and offers specific guidance to numerous marketers striving to improve their social media efforts. It is suggested that future studies can work on the different extension of the present research by using larger sample size, different population samples; and the ever-changing nature of social media platforms can provide deeper insights into consumer behavior in the digital age.

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Digital Marketing through the lens of Personalized Marketing, Consumer Behavior, Market trends and brand engagement

Khansa Butt¹, Dr Muhammad Adnan Sial²

¹School of Business and Management, Information Technology University, Lahore, Pakistan

²Assistant Professor: UE Business School, Division of Management and Administrative Science, University of Education, Lahore, Pakistan

Abstract

This research paper analyzes the complex dynamics of digital marketing in the context of personalized marketing, consumer behavior, market trends, and brand engagement. Personalized marketing, the independent variable, utilizes data-driven techniques to provide tailored experiences that reflect individual consumer preferences, allowing for a deeper connection and a higher level of engagement. Consumer behavior, the dependent variable, is analyzed in terms of how these personalized efforts influence decision-making, emotional responses, and purchasing patterns. Market trends is a moderating variable that gives insight as to how changing societal aspects, technological changes, and economic changes affect the productivity of marketing strategies. Again, brand engagement is acting as a mediating variable that connects marketing activities towards consumer responses by creating consumer trust, loyalty, and active involvement. A global approach is adopted, taking into account a diversified sample, in order to catch both universal and localized nuances of digital marketing. This research will explore how the adoption of personalized marketing strategies helps enhance brand engagement and consumer behavior in emerging markets. It integrates insights from advanced technologies, consumer analytics, and digital platforms into the study and provides actionable recommendations to businesses with an aim to optimize strategies within the rapidly growing and competitive and dynamic environment of digital space. Structured questionnaires targeting 200 employees and responses from 120 participants was received. Convenient sampling is used, and the questionnaire combined original items and modified instruments from previous studies. The reliability of the data was assessed using Cronbach's Alpha, while the hypotheses were analyzed using the Process Hayes tool in SPSS version 27. The findings emphasize that marketing efforts should be in line with consumer expectations and market dynamics to create meaningful and impactful connections. This research contributes to the growing body of knowledge on digital marketing, offering valuable insights for academics, practitioners, and businesses seeking to innovate and thrive in a rapidly evolving marketplace.

Introduction

Businesses have become increasingly reliant on innovative marketing strategies to engage with consumers in today's rapidly evolving digital landscape. Digital marketing has been a transformative force that leverages technology, data analytics, and online platforms to connect with audiences in more meaningful ways than ever before. It is also

different from traditional approaches because digital marketing creates tailored experiences for individual consumers' unique preferences and behaviors. Central to this change is personalized marketing, which uses data-driven techniques to craft targeted messages and recommendations that resonate with specific audiences. By fostering relevance and emotional connection, personalized marketing has become a cornerstone of modern strategies, enabling businesses to enhance engagement, loyalty, and customer satisfaction (Kumar et al., 2020).

Consumers is the heart of good marketing to make sense of the behavior around decisions and loyalty, but at all instances, the shift of modern digital marketing to consumers would actually transform the way the decision processes are taken into new modes. Now that there have always been social media platforms connecting people and interaction ads meant at persuading people and consumers; however, in order to boost their digital marketing, marketers need to study the trend of these consumer behaviors. Furthermore, market trends such as sustainability, inclusivity, and technological advancements shape consumer expectations and brand perceptions, emphasizing the need to align marketing strategies with societal and economic changes (Kotler et al., 2020).

Brand engagement is the emotional, cognitive, and behavioral connections that consumers build with brands and acts as a vital mediator in the marketing-consumer behavior relationship. Successful engagement of consumers leads to trust, loyalty, and advocacy; interactions become long-term relationships. This study explores the nexus between personalized marketing, consumer behavior, market trends, and brand engagement and offers insight into strategies that resonate with diverse global audiences. The paper adds further to the knowledge base of digital marketing and will guide practitioners on how best to navigate the complexities of the modern landscape of the consumer.

Broad Area of Research

The broad area of this research is digital marketing. It is an evolving field that brings together technology, data analytics, and innovative strategies to transform the ways in which businesses interact with consumers. Digital marketing encompasses a wide range of practices, such as personalized advertising, content marketing, influencer collaborations, and the use of advanced technologies like artificial intelligence to create impactful consumer experiences. This will use the power of digital platforms, such as social media, e-commerce sites, and search engines, to directly reach targeted audiences in more precise and efficient manners. Thus, as consumer behavior adapts to technological advancements and the changing society, it calls for a critical role from digital marketing in order to enhance engagement, create loyalty towards the brand, and grow the business amidst increased competitive and interconnected global marketplace conditions.

Specific Area of Research

The specific emphasis of this research is placed on the interplay of personalized marketing, consumer behavior, market trends, and brand engagement in the digital marketing space. The study looks into how, as a data-driven method, personalized marketing impacts consumer decisions and deepens brand relationships. It also looks into

how factors such as technological advancement, sustainability, and inclusivity moderate market trends to impact the effectiveness of these personalized efforts. But brand engagement also serves as a mediating factor to translate marketing strategy into consumer action, be it loyalty and advocacy. In this respect, the findings of the research will point toward concrete business strategies to enhance their marketing activities with regard to shifting consumer expectations and global patterns.

Research problem

The rapid evolution of digital marketing has altered the way businesses reach out to consumers, with an emphasis on personalized strategies tailored to individual preferences and behavior. However, such approaches remain largely unexplored in developing markets like Pakistan, specifically how consumer behavior, market trends, and brand engagement interact with personalization efforts. It becomes difficult for businesses to harmonize their strategies with technological changes, cultural differences, and ethical values. They cannot develop effective, long-term consumer relationships in most cases. This research gap is filled by exploring the role of personalized digital marketing on consumer behavior and brand engagement in Pakistan, offering insights to improve strategy and be more competitive, dynamic, and ethically responsible in the marketplace.

Significance of the Study

This study is important in that it addresses the changing nature of digital marketing by exploring critical relationships between personalized marketing, consumer behavior, market trends, and brand engagement. Understanding how personalized marketing affects a customer's choices will prove beneficial for companies to design more appropriate and effective campaigns. This research indicates the critical link between market trends as a moderating variable and the need of marketers to align marketing campaigns with changes in society or technology. Moreover, the use of brand engagement as a mediator emphasizes the fact that more emotional and behavioral connections should be built with the consumers for the sake of loyalty and advocacy. The conclusions of this research are useful to businesses to compete in an increasingly digital and globalized market while making a contribution to the academic discussion on the strategies of digital marketing.

Motivation of the Research

The motivation for this study arises from the rapid evolution and transformative potential of digital marketing in a competitive global marketplace. Businesses increasingly seek to create meaningful consumer connections through personalized, data-driven strategies that go beyond traditional marketing approaches. Understanding the interplay between consumer behavior, emerging market trends, and brand engagement is critical for optimizing these efforts. As technological advancements reshape marketing practice and consumer expectations, the research aims to provide actionable insights that will deal with the complexities of personalization and ethical considerations within innovative tool integration. This will attempt to contribute to the literature in both academic understanding and practical strategies to utilize digital marketing in creating stronger and more resilient brand-consumer relationships.

Literature Review

Personalized Marketing

Personalized marketing is a transformational approach to reach the consumer by creating tailored experiences and communication strategies. Personalized marketing differs from traditional marketing because it takes a one-size-fits-all approach. It utilizes data and technology to meet the needs, behaviors, and preferences of individual consumers. The concept is to create meaningful connections through relevant content that resonates with target audiences. This practice has gained significant momentum in recent years, with businesses increasingly recognizing its potential to enhance consumer engagement, satisfaction, and loyalty. According to Kumar et al. (2020), personalized marketing plays a critical role in driving customer-centric strategies that align with evolving consumer expectations in a highly competitive digital landscape.

The basis of personalized marketing is the proper use of data. Companies collect consumer data from different sources, such as web browsing history, purchase patterns, and demographic information. This data is then subjected to analysis to identify patterns and learnings that inform marketing strategies. For instance, behavioral data provides actionable insights into preference and decision-making processes, through which brands can deliver tailored messages. Smith and Zook (2020) emphasize that strategic segmentation of consumers based on these insights allows businesses to design campaigns that are not only relevant but also impactful, fostering deeper connections between brands and their customers.

Using high levels of technology, personalized marketing scales its efforts. Today's advanced tools, such as the existence of an AI system and a good customer relationship management, support brands in automating this personalization process. Advanced AI-predicting algorithms can recognize past and general behaviors of consumers and predict consumers' preferences in advance, aiding in delivering tailored product offerings and offers. Netflix and Amazon are great examples, where recommendation has increased user engagement and retention for customers (Gomez-Uribe & Hunt, 2016). Shankar et al. (2021) further emphasize the role of technology in marketing, stating that companies using AI and machine learning tend to outperform their competitors in terms of customer satisfaction metrics.

The benefits of personalization in marketing are very clear. It can help in enhancing consumer engagement and increasing the conversion rate. Brands, by providing content that fits individual needs and interests, can create a sense of relevance and value. This relevance not only captures attention but also encourages consumers to take the desired actions, such as making purchases or signing up for services. Johnson and Lee (2021) point out that the email campaigns personalized are far more effective than generic campaigns as they reach higher engagement levels. Additionally, personalization results in long-term customer loyalty since it leaves behind a positive memory. According to Brown (2022), customers tend to be loyal to the same brands that keep meeting their expectations through personalization.

There are some problems associated with personalization. One of the most critical issues is data privacy. With businesses collecting and analyzing vast amounts of consumer data, they have to navigate ethical and legal considerations to maintain trust. The implementation of regulations such as the General Data Protection Regulation (GDPR) underlines the need for transparency and compliance in data handling practices (Martin, 2019). Consumers are getting more aware of how their information is being used. It's crucial for brands to balance personalization with privacy. Smith and Zook (2020) state that over-personalization can be harmful if it's seen as an invasion of privacy, resulting in a negative perception of the brand.

The integration of systems for the effective execution of personalized marketing strategies is yet another challenge. Most businesses would need to consolidate data coming from multiple sources and platforms, which would consume much of their resources. Despite these challenges, however, the benefits of personalized marketing far outweigh its limitations. According to Reid and Brown (2020), companies that invest in strong data infrastructure and proper ethical data practices are more capable of fully leveraging the power of personalization, which ultimately enables them to increase their competitive advantage.

Real-life examples prove the phenomenal impact of personalization-based marketing. Amazon's algorithm, for example, selects products based on user habits and preferences, which leads to better conversion ratios and customer satisfaction (Gomez-Uribe & Hunt, 2016). Netflix bases its content recommendation on data-driven intelligence, which increases engagement and retention. Starbucks also embraced personalization through its mobile app, giving customers individualized rewards and recommendations on their purchases. This had a great effect on customer loyalty (Davis, 2021).

Technology continues to improve, and its future is quite bright for personalization in marketing. There will be great hyper-personalization driven by advancements in AI and machine learning, where brands can create real-time and context-specific experiences. For example, wearable devices could offer health information that companies can base recommendations for products or services related to fitness (Chaffey, 2021). Personalization across Omni channel interfaces is another developing trend - providing a seamless experience across all contact points, including web sites and applications and physical stores (Brown, 2022). Ethical personalization which is centered on transparency, but the most important, consumer's permission will be significant as consumers' concerns with privacy persist. Martin (2019) points out that companies using ethical personalization are more likely to establish trust and create long-term relationships with their customers.

Personalized marketing has changed the game in the way businesses engage with consumers. It provides an opportunity for deeper engagement, better loyalty, and increased customer satisfaction. Using data, technology, and tailored content, brands can make meaningful and impactful connections with their audience. Challenges, including data privacy and system integration, continue to be experienced. However, the adoption of innovative yet ethical business models places such businesses at the helm in the pursuit of competing for increasingly digitized spaces. Personalized marketing is no longer just

a strategy; it has become an anchor to making every interaction with consumers relevant and of value.

Digital Marketing through the Lens of Consumer Behavior

Digital marketing has emerged as a transformative force in the way businesses communicate with consumers, shifting focus from traditional to more targeted and personalized approaches. At its core, it uses technology, data, and online platforms to engage consumers and influence their behavior. Understanding consumer behavior is essential to the success of digital marketing efforts because it helps businesses craft strategies that resonate with their target audience and drive meaningful outcomes. Consumer behavior is the psychological, social, and cultural factors influencing purchasing decisions, and it can be crucial in understanding how individuals interact with brands in a digital landscape. These findings have transformed the marketing landscape, where companies can align their approach with the changing tastes and demands of consumers (Kotler et al., 2020).

The development of digital marketing is highly linked to the availability and prevalence of the internet, which has transformed the way consumers can access information and options. Unlike passive consumers of traditional media, the current consumer is active in seeking, evaluating, and sharing information online, thus creating a more dynamic and complex behavior. Digital marketing is central to this behavior by offering experiences that are personalized, interactive, and engaging. For instance, using data-driven insights, businesses can predict what a consumer is likely to prefer in terms of products or services and tailor their messaging accordingly. A few studies show that personalization positively and hugely helps to engage consumers, whereby there is more interaction with people when they feel the message is close to their lives (Chaffey, 2021).

Social media is central to digital marketing, giving a platform directly that businesses use to interact and engage with the consumer to induce their behavior. These tools, therefore, give brands ample room to connect, build a customer relationship, and create customer loyalty while encouraging user-created messages that spread the word farther. Integration of social media into digital marketing strategy has transformed consumer behavior with a two-way communication platform that gives consumers a chance to voice opinions, share experiences, and connect with the brands in real time. The social dimension of digital marketing offers businesses the opportunity to capitalize on peer influence, an element that has a powerful role in decision-making, as argued by Solomon (2022). For example, social media is the common platform on which consumers depend upon reviews and recommendations from their peers for making purchase decisions. Social proof has therefore been an essential feature that demonstrates the significance of knowing consumer behavior in creating appropriate digital marketing strategies.

Digital marketing is also significant in its role of influencing the decision-making process of the consumer. This was divided into five steps in the earlier days: problem recognition, information search, evaluation of alternatives, purchase decision, and post-purchase behavior. The digital disruption has opened new touchpoints and engagement opportunities outside this linear model. This means that, through search engine

optimization and targeted advertisements, a company can reach a consumer in the information search stage, directing him to their platforms. Personalized product recommendations and retargeting ads will also influence the evaluation and purchase stages, pushing a consumer toward one brand over its competitors. These strategies illustrate that one should use the information acquired through consumer behavior insights for efficient marketing and conversion goals (Hoyer et al., 2020).

Another essential aspect that digital marketing seeks to address is the emotional dimension of consumer behavior. Positive emotional experiences tend to cause consumer preferences and decisions as well as stronger brand loyalty because of the role that emotions play in shaping consumer behavior. Digital marketing exploits this knowledge to devise content that can resonate with emotion in consumers. Storytelling campaigns could evoke some sense of nostalgia, happiness, or empowerment within a consumer's psyche toward brands. As argued by Keller (2019), without emotional branding, no brand differentiates itself and no enduring relationships are made in a consumer's heart with a brand. Business entities influence consumer behavior and improve their general perception of the brand by realigning marketing messages to emotional needs of the consumers.

The contribution of data analytics in understanding consumer behavior and influencing it is also huge. Digital marketing works largely on data to provide insight about consumer preferences, behaviors, and interactions. A data-based approach helps businesses recognize patterns, segment audiences, and develop targeted content that appeals to the specific group. For example, behavioral analytics can identify how consumers are navigating a website, which allows marketers to optimize the user experience and encourage desired actions. Predictive analytics goes one step further by predicting future behavior, which allows businesses to stay ahead of consumer expectations. Shankar et al. (2021) highlight that the integration of data analytics into digital marketing strategies enhances precision and efficiency, ultimately driving better outcomes for businesses and consumers alike.

One of the most important contributions that digital marketing has to consumer behavior is its role in facilitating transparency and trust. At a time when consumers are increasingly becoming skeptical of traditional advertising, digital platforms provide an avenue for brands to prove their authenticity and accountability. For example, user-generated content, including reviews, testimonials, and social media posts, can be seen as unbiased input that influences consumer trust. As highlighted by Solomon (2022), the opinions of other consumers are more valued than corporate messaging, and thus user-generated content becomes a strong behavior influencer. In addition, digital marketing enables businesses to make prompt responses regarding consumer feedback, alleviating concerns and reiterating commitment to customer satisfaction.

However, digital marketing and consumer behavior have the intersections that pose challenges as well. The major problem now is data privacy as more consumers are getting concerned over their information collection and utilization process. Personalized marketing creates high relevance but poses questions to ethics and the law of consent and transparency. Businesses must navigate these concerns carefully to maintain trust and compliance with regulations such as the General Data Protection Regulation (GDPR).

Martin (2019) emphasizes that ethical data practices are essential for building long-term relationships with consumers and ensuring the sustainability of digital marketing strategies.

The rapid pace of technological advancements complicates this relationship between digital marketing and consumer behavior even more. Emerging technologies like artificial intelligence, augmented reality, and voice assistants are ever changing the expectations and dynamics in consumer interactions. Chatbots powered by AI offer fast help, while AR allows visualizing products in one's surrounding before buying them. These innovations enhance convenience and engagement but also require businesses to adapt their strategies to stay relevant. Agility and responsiveness, according to Hoyer et al. (2020), have become critical in using new technologies effectively and adapting to shifts in consumer behavior.

In a nutshell, digital marketing has altered the business-consumer relationship fundamentally by focusing on how to understand and influence behavior. It is based on insights into consumer preferences, emotions, and decision-making processes to craft strategies that speak to an audience and create meaningful outcomes. The integration of data analytics, social media, and emerging technologies further enhances the potential of digital marketing to mold consumer behavior and create chances for deeper engagement and higher brand loyalty. As the world of digital evolves, a business needs to be attuned to the shifting dynamics in consumer behavior to thrive and succeed in the market in an increasingly competitive environment.

Market Trends

Market trends simply put refer to the patterns and directions in which the industries seem to change with the evolution of tastes and preferences on the part of consumers, technology, economic determinants, and the social matrix. In terms of digital marketing, market trends will drive the strategy and tactics businesses adopt to keep up and compete in their field. Market trends give light to the changing consumer behavior landscape, technological innovation, and the dynamic requirements of the global marketplace. Understanding and responding to market trends is crucial for businesses seeking to anticipate changes, align with consumer expectations, and capitalize on emerging opportunities (Kotler et al., 2020).

One of the most significant drivers of market trends in digital marketing is technological innovation. As technology advances, it creates new possibilities for reaching and engaging consumers. For example, artificial intelligence has transformed the way businesses interact with their audiences, making it possible to have a personalized experience at scale. AI-powered tools, such as chatbots, predictive analytics, and recommendation engines, are necessary for providing timely and relevant content to consumers. Shankar et al. (2021) point out that businesses embracing AI-driven marketing strategies are more likely to be competitive due to increased customer engagement and campaign optimization. Similarly, the spread of mobile technology has transformed consumer behavior, with smartphones becoming the first point of access for online content. This development has resulted in the expansion of mobile marketing,

which is characterized by responsive websites, in-app advertising, and mobile-first campaigns.

The increasing dependence on data-driven decision-making is another important market trend. As businesses collect vast amounts of consumer data, the same can be analyzed to track patterns, preferences, and emerging needs. Such an approach helps marketers make informed decisions based on product development, pricing strategies, and promotional campaigns. For instance, predictive analytics enables businesses to predict the future and adapt their products accordingly. According to Chaffey (2021), data-driven marketing improves efficiency and enhances the relevance of marketing efforts so that businesses are always in line with the market demands. Additionally, the emergence of big data and advanced analytics tools has democratized access to insights so that businesses of all sizes can compete effectively in the digital space.

Social and cultural shifts also play a significant role in shaping market trends. The changing values, attitudes, and lifestyles of consumers create demands for products and services and influence business strategies. The rising focus on sustainability is just one example that has increased the demand for green products and practices. Consumers today are conscious of the environmental impact of their choices and expect brands to align with their values. Keller (2019) states that sustainable businesses attract not only socially responsible consumers but also gain trust and loyalty. Similarly, the inclusivity and diversity trends have reframed the marketing stories as brands are looking to include diverse audiences and create a sense of belonging. These changes underscore the need to remain sensitive to social changes and incorporate them into marketing. Consumer behavior is also evolving and impacting market trends. Consumers empowered through information access in the digital age make more informed decisions. Consumers now seek transparency, authenticity, and value in their interactions with brands. Influencer marketing has emerged as a result of this trend, where consumers believe in the recommendations of relatable individuals rather than traditional advertising. Solomon (2022) points out that influencers bridge the gap between brands and consumers by offering authentic endorsements that resonate with their audience. Additionally, the demand for personalized experiences has become a defining trend, with consumers expecting brands to cater to their unique needs and preferences. Businesses that embrace personalization as a core strategy are better positioned to foster deeper connections and drive customer loyalty.

Other critical determinants of market trends include economic factors. Economic factors comprise inflation, unemployment rates, and disposable income levels. They determine consumer spending patterns and preferences. Consumers become price-sensitive during times of economic decline. Firms are forced to adopt value-based marketing during such periods. Conversely, economic prosperity is often characterized by a rise in consumer spending on premium and luxury products. Given this, knowledge of the emerging trends will enable companies to act on the prevailing pricing strategies and promotional activities according to consumer demand expectations. According to Hoyer et al. (2020), businesses monitoring the evolving economic indicators and then responding will perform better in such fast-changing markets.

New market trends are also generated with globalization. Businesses have expanded their boundaries, receiving diverse people into their portfolio. This has resulted in the adoption of cross-cultural marketing strategies that consider the unique preferences and behaviors of consumers in different regions. For example, brands entering international markets often localize their messaging and offerings to resonate with local audiences. According to Kotler et al. (2020), globalization offers opportunities and challenges, requiring businesses to balance standardization with customization. It's by staying current about the trends in and about different cultures that businesses stay sharp when they move to global markets with complicated structures.

The fast rising wave that will dominate tomorrow's future of digital marketing pertains to ethical concern, with growing importance nowadays due to increasing awareness issues involving privacy about data use and business pressure to adopt such open practices. Regulations like the General Data Protection Regulation (GDPR) and the California Consumer Privacy Act (CCPA) have set strict standards for data collection and usage, forcing businesses to focus on consumer consent and data security. According to Martin (2019), ethical marketing practices not only comply with regulations but also help in building trust and credibility with consumers. The brands that favor social causes and implement CSR programs hold relatively higher levels of consumer loyalty and advocacy.

The swift pace of change in market trends indicates agility and adaptability are of utmost importance for businesses as people's preferences change overnight, and technological improvements happen overnight in such a changing environment. Shankar et al. (2021) emphasize that firms investing in research and development, collaborating with industry experts, and utilizing emerging technologies are better placed to respond to uncertainty and capitalize on opportunities. This enables businesses to establish themselves as market leaders and develop sustainable competitive advantages.

Market trends form the backbone of the strategies and success of businesses in the digital age. Understanding the factors driving these trends, including technological advancements, consumer behavior, and societal changes, enables businesses to align their marketing efforts with evolving market demands. Integration of data-driven insights, ethical considerations, and global perspectives further enhances the ability of businesses to respond to trends effectively. As the digital landscape continues to evolve, staying informed about market trends will remain essential for businesses seeking to thrive in an increasingly complex and competitive environment.

Brand Engagement

Brand engagement is the emotional, cognitive, and behavioral connection consumers have with a brand. It is a multidimensional concept that reflects how consumers interact with, perceive, and develop loyalty toward a brand. Brand engagement has become a cornerstone in today's dynamic marketing environment for businesses looking to create meaningful and long-term relationships with their customers. The process of engagement is not merely transactional exchanges but creating a bond that will help in fostering trust, loyalty, and advocacy. Keller (2019) defines brand engagement as the extent to which

consumers identify with a brand and integrate it into their lifestyles, making it a key determinant of brand success.

In the digital age, the form of brand engagement is something new as brands have significantly employed online platforms and social media to reach their customers. Consumers can now, for example, interact with a brand in real-time where they provide feedback, share content, and participate in conversation. These interactions not only boost visibility but also generate community among consumers. For example, with social media posts, reviews, and testimonials, consumers can directly take an active role in shaping a brand's image. According to Solomon (2022), it is this participatory quality of digital platforms that facilitates more profound engagement because it gives consumers a sense of belonging and being recognized by brands with which they interact.

Emotional engagement is the one thing through which a positive association may develop between the consumer and the brand. In general, emotional connections are formed either through storytelling, personalized marketing, or campaigns that appeal to a consumer's values and aspirations. Brands that talk more about sustainability or inclusivity often create stronger emotional relationships with consumers who share such values. According to Keller (2019), consumers emotionally engaged with the brand will be more likely to express loyalty, make repeat purchases, and recommend the brand. This emotional resonance becomes a competitive advantage, especially in saturated markets with similar products and services.

The other dimension of brand engagement is the behavioral engagement-the actions consumers would take to interact with a brand. This can manifest through such activities as following a brand on social media, sharing its content, taking part in online discussions, or even attending brand-sponsored events. Behavioral engagement is often more likely to lead to higher brand loyalty and advocacy. Shankar et al. (2021) reported that engaging consumers are likely to act as brand ambassadors by influencing other people through word-of-mouth recommendations. Such advocacy would not only increase the strength of the brand reputation but also increase its outreach in a cost-effective manner.

Cognitive engagement is just as essential in building brand engagement. This refers to the extent of thought and relevance that a consumer thinks about and associates with a brand on the intellectual level. Brands providing value through educational content, insights, or innovative ideas easily succeed in catching the eye of consumers and creating deep engagement. For example, content marketing strategies by companies that are blogs, webinars, or how-to videos create a scenario where the consumers view them as a thought leader in their given industries. According to Chaffey (2021), cognitive engagement supports the establishment of a brand as a trusted information source that would boost credibility and trust. The nature of digital marketing has transformed how brands can develop engagement with audiences, creating possibilities for personal and immediate engagement. The application of artificial intelligence and data analytics helps in giving tailored messages and recommendations aligned to consumer preferences. For instance, personalized marketing will make a consumer feel understood and appreciated, which in turn is associated with more engagement. Shankar et al. (2021) indicate that personal approaches usually yield better consumer-brand relationships since they imply that the brand is actually concerned about fulfilling consumer needs. The other area is using

interactive content such as polls, quizzes, and virtual reality experiences to engage consumers in memorable brand interactions.

Social media is especially important for building brand engagement, as it gives consumers direct interaction with the brands and other consumers. Social media channels such as Instagram, Twitter, and Facebook give the brand an opportunity to voice out their values, updates, and conversations with their target market. The two-way communication helps to bring a feeling of transparency and authenticity in a brand that are the essence for building trust. Consumers are more likely to interact with responsive and transparent brands. In addition, social media can be used as a means for brands to present user-generated content, which is also an engagement-enhancing tool that gives consumers a feeling of community and inclusion (Solomon, 2022).

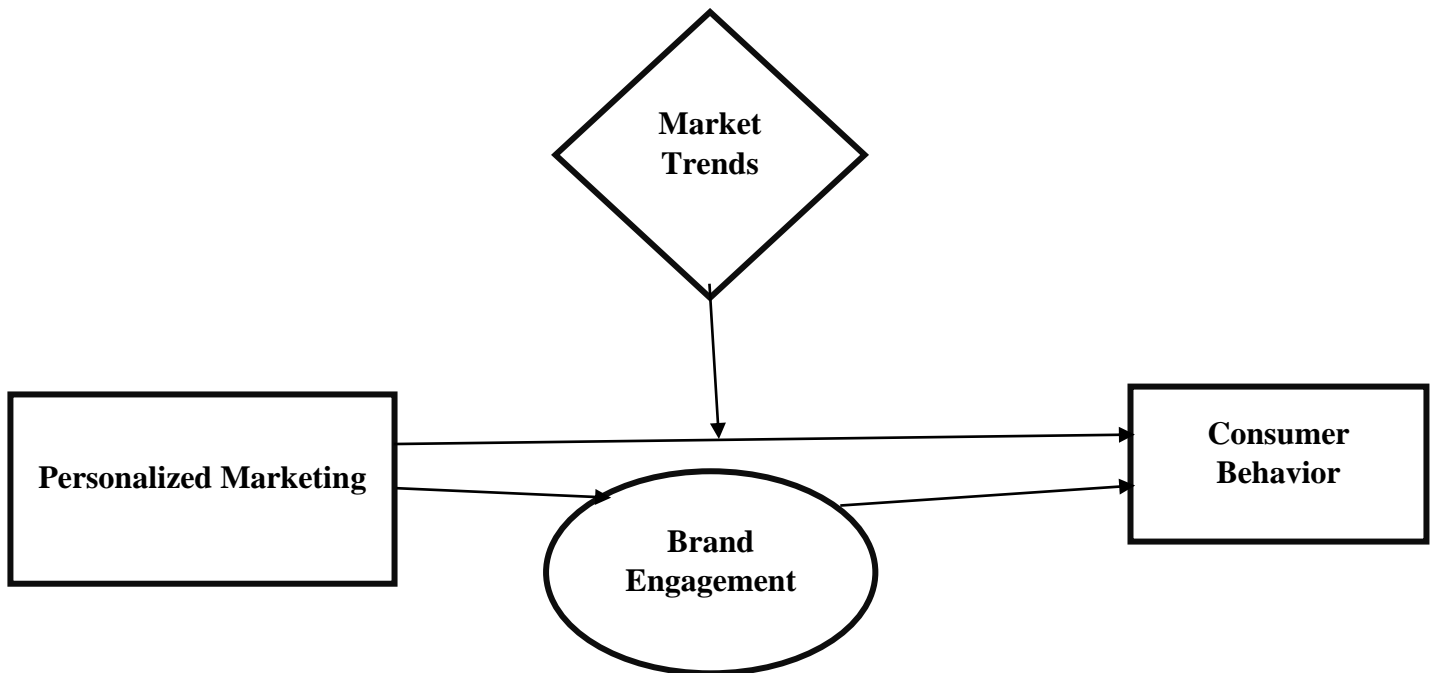
Though the advantages of brand engagement are great, achieving it demands a strategic approach. To establish relevance, authenticity, and congruence of messages, interactions must be relevant on all touchpoints. If the touchpoint is anachronistic or inauthentic, trust will soon be lost and disengagement can take place because an inconsistent touchpoint erodes trust, argues Keller in (2019). Brands further need to listen to and respond to consumer feedback- making them listen more to build a more enhanced consumer experience to show how the brand makes out from meeting expectations.

Brand engagement also mediates the link between marketing efforts and consumer behavior. For example, personalized marketing strategies that resonate with the consumer often lead to high engagement levels, which affect purchasing decisions and loyalty. Just like that, emerging trends in the market, like sustainability or inclusivity, can be enhanced through engagement as long as the brand can align its values and messaging along those lines. Shankar et al. (2021) stated that engagement serves as a bridge, which transforms the marketing efforts into the direct actions of consumers such as purchase, recommendation, and advocacy.

The impact of brand engagement goes beyond the individual consumers and further influences the overall brand perceptions as well as market positioning. More likely, engaged consumer's associate positive attributes, for example, quality, innovation, and reliability with the brand. This favorable perception strengthens the brand's equity and competitive advantage, making it more resilient in challenging market conditions. Chaffey (2021) notes that engaged consumers often become lifelong advocates, contributing to the brand's long-term success through their loyalty and advocacy.

In conclusion, brand engagement is a vital component of modern marketing strategies, encompassing emotional, behavioral, and cognitive dimensions. Meaningful interactions and trust building help brands create long-term relationships with their consumers, which leads to loyalty and advocacy. The digital age has amplified the importance of engagement, offering new opportunities for brands to connect with their audience through personalized and interactive approaches. As businesses continue to navigate the complexities of consumer behavior and market trends, brand engagement remains a key factor in achieving sustainable growth and success

Schematic Diagram



Sample size and strategy

Convenience sampling was applied in the study, ensuring accessibility and ease of participation. The total number of questionnaires completed by international participants in different demographic groupings was 102. Female responders made up a larger number, with 69, and 33 men only. The age distribution majority consists of 65 individuals between 15 and 24 years of age, followed by 19 in the range of 25 to 34, 14 in the 35 to 44 range, and 4 in the age bracket of 45 and older. This widely ranged sample provided very telling insight regarding how brand engagement and the behavior of a customer change with personalized digital marketing along different demographics. Convenience sampling made it easy to collect data, but because of the possibility of selection bias, the results may not be generalizable to a larger population

Instrumentation and Measurement Scales

The survey instrument comprised structured questions to measure four key constructs: market trends, market trends, and brand engagement. Four main constructs that are Personalized Marketing, market trends, customer behavior, and brand engagement—were covered by the structured questions in this study. Because these constructs were modified from earlier studies, the measuring scales are valid and pertinent.

Personalized Marketing

Items were collected from studies such as Johnson & Lee (2021) and Kumar et al. (2020), which focused on how personalized marketing activities (such as customized ads, product recommendations, and email offers) affect customer happiness and engagement.

Market Trends

The constructs that measured consumer responsiveness to social, seasonal, and brand patterns served as the foundation for the scale used to measure market trends. These items are comparable to the scales that Martin (2019) and Kotler et al. (2020) used to assess how shifting market dynamics affect consumption

Consumer Behavior

Items based on review-influenced judgments, smooth online experiences, and following trends were used to evaluate this construct. These items were taken from Solomon (2022) and Shankar et al. (2021).

Brand Engagement

According to Keller (2019), Shankar et al. (2021) developed emotional, cognitive, and behavioral engagement items that assessed trust, emotional ties to a brand, and active social media activity with a brand.

A Likert scale, with 1 denoting "strongly disagree" and 5 denoting "strongly agree," is used to calculate this score. Cronbach's Alpha is used to determine reliability, confirming that all constructions met or exceeded the 0.6 threshold required by Nunnally (1978).

Unit of analysis

Individuals form the basis of the study as the unit of analysis. The responses of the respondent were analyzed to ascertain how their behavior, decision-making, and engagement with a brand are affected by the customized forms of marketing. Through focusing on people, the research aimed at understanding the individual experience and opinions relating to digital marketing.

Inclusion Criteria

Eligible participants for this study included those who were active users of digital media and exposed to personalized marketing approaches. These included individuals above 15 years old and from various international backgrounds, not limited to gender, occupation, or geographical location. Participants were expected to be literate enough to comprehend and respond to the questionnaire in a meaningful way, providing insight into consumer behavior and brand engagement.

Exclusion Criteria

Participants who were not active users of digital platforms or had limited exposure to the personalized marketing strategies were excluded. Those below the age of 15 years and those who could not understand or complete the questionnaire because of language barriers or other constraints were also excluded. Moreover, incomplete responses or surveys with considerable missing data were excluded from the final analysis to ensure the validity and reliability of the findings.

Research design

This study uses a quantitative research approach to investigate how consumer behavior, market trends, brand engagement, and tailored marketing interact. These

variables were investigated based on the study hypotheses, which served as a guide for the procedures of data collection and analysis. Participants' answers about their demographic traits, work-related details, and variables relating to the study's goals were gathered through structured questionnaires. IBM SPSS version 27's PROCESS HAYES was used to evaluate the gathered data, providing valuable insights into the viability of the hypotheses. The study was able to examine the mediating and moderating impacts of market trends and brand engagement on the relationship between consumer behavior and personalized marketing thanks to this analytical technique. Frequencies were then calculated using descriptive analysis, resulting in a clear and organized display of demographic data, including gender, age, and experience categories. This method made sure that thorough demographic profiling and statistical rigor were used to provide a strong basis for interpreting the findings and formulating practical suggestions.

Discussions

The outcomes of this study demonstrate how customized marketing changes the behavior of consumers and enhances their engagement with the brand. Consumer decision-making, emotional response, and buying habits have all been shown to be significantly altered by personalized marketing-a highly customized and data-driven approach. This is in line with other research, such as that done by Kumar et al. (2020), which highlighted how personalization increases customer happiness and loyalty by generating relevance and emotional resonance. Businesses can establish stronger relationships with their target consumers by providing experiences that are tailored to their specific situation.

One point marked on this dynamic character of today's marketing environment is in reference to market trends such as sustainability and integration coupled with technical breakthroughs. On reflection to the findings of this research, it is clearly a signal that firms would also remain relevant only if flexible in responding to social and technological shifts to sustain competitiveness. These findings are in tandem with Kotler et al. (2020), who opined that success is contingent upon marketing strategies responding to shifting demands of consumers and global market conditions. Therefore, companies embracing sustainability while implementing marketing will not only meet the needs of consumers but also gain the confidence and trust of socially responsible consumers.

Brand engagement is one of the most important mediating factors in converting marketing tactics into customer action. Customers would grow in advocacy, loyalty, and trust if they believed that targeted marketing efforts were worthwhile. This further supports Keller's (2019) argument that establishing behavioral and emotional ties with customers through involvement is critical to the development of long-term relationships. For example, emotionally attached customers were more likely to champion the brand, as the survey said, which points out the significance of engagement as a connection point of marketing efforts and real outputs.

However, the findings also highlight challenges in implementing personalized marketing, especially on ethical and data protection grounds. Businesses collecting a significant amount of information from their customers have to ensure they are in

compliance with laws such as the GDPR. According to Martin (2019), the preservation of customer trust and prevention of potential backlash against intrusive personalization depend on ethical data practices. As noted by Smith and Zook (2020), over-personalization may also lead to poor views of consumers if seen as intrusive.

Finding a balance between privacy and personalization remains a major challenge to marketers.

The demographic research of the study revealed that, especially among the age group of 15 to 24 years, younger participants were more involved, signifying their familiarity and dependency on the digital platforms. This conclusion is in line with research by Shankar et al. (2021), who revealed that because younger generations utilize technology more frequently, they are more responsive to tailored digital marketing. The older age groups were a bit lower compared to others, and there lies a necessity for inclusive tactics by accepting various age groups.

In summary, by highlighting the importance of tailored marketing as a motivator for customer behavior and brand engagement, this study adds to the corpus of knowledge in digital marketing. It gives practical suggestions for firms to adapt, such as implementing ethical data methods, synchronizing advertising with current market trends, and developing emotional connections through engagement techniques. These findings validate prior literature while offering practical tips for navigation through the intricacies of a digital marketplace. Future studies should examine how tailored marketing affects customer loyalty over the long run and how it might help companies develop sustainably.

Data analysis

Demographics- (Descriptive Statistic)

		Numbers	%
Gender	Male	33	32.4
	Female	69	67.6
Total		102	100
Age	15-24	65	63.7
	25-34	19	18.6
	35-44	14	13.7

	45 and above	4	3.9
Total		102	100
Engage Rate	Never	6	5.9
	Rarely	34	33.3
	Sometimes	22	21.6
	Often	40	39.2
Total		102	100

The majority of respondents were female (N = 69, 67.6%), with a significant portion being male (N = 33, 32.4%). Age-wise, the largest group was between 15-24 years (N = 65, 63.7%), followed by 25-34 years (N = 19, 18.6%) and 35-44 years (N = 14, 13.7%). A smaller portion of the sample was in the 45 and above category (N = 4, 3.9%). Regarding engagement rate, the highest number of respondents reported using the platform "often" (N = 40, 39.2%), followed by "rarely" (N = 34, 33.3%), "sometimes" (N = 22, 21.6%), and "never" (N = 6, 5.9%).

Table 2 – Reliability Analysis

Variable	Cronbach's alpha	No. of items
Personalized marketing	.729	2
Market trends	.838	4
Consumer behavior	.789	2
Brand engagement	.881	3

From table 2 the result shows the reliability of the variables where all the

Cronbach's α value is above the acceptable level of .6 as suggested by Nunnally (1978). Alpha value of independent variable, i.e., personalized marketing (PM), of this research with all 3 items included was .671, which was less than .7. The alpha value after removing the third item of this variable, PM3, increased to .729 making it more reliable. The assessment of the access and control showed a high reliability Coefficient estimated to be .838 over the 4 items of Market trends. Alpha value of independent variable, i.e., consumer behavior (CB), of this research with all 3 items included was .783. The alpha value after removing the first item of this variable, CB1, increased to .789 making it more reliable. With a Cronbach's α of .881 across the 3 items of Brand engagement, this variable had also good reliability.

Regression Analysis Using PROCESS Hayes Macro (Model 5)

Outcome Variable: Brand Engagement (BE)

This section examines the effect of the independent variable (MT) on the mediator (BE).

Model Fit

$R=0.5347$, $R^2=0.2859$: About 28.59% of the variance in BE is explained by MT.

$F(1, 100) = 40.0377$, $p < 0.0000$: The model is statistically significant.

Regression Coefficients

Constant: $\beta = 2.3250$, $p < 0.000$: The baseline BE value when MT = 0.

MT: $\beta = 0.4309$, $p < 0.000$: A significant positive effect, indicating that a one-unit increase in MT increases BE by 0.4309 units.

Outcome Variable: Personalized Marketing (PM)

This section examines the effects of MT, BE, CB, and their interaction on the dependent variable (PM).

Model Fit

$R=0.5873$, $R^2=0.3449$: About 34.49% of the variance in PM is explained by the predictors.

$F(4, 97) = 12.7674$, $p < 0.0000$: The model is statistically significant.

Regression Coefficients

MT: $\beta = -0.3540$, $p = 0.2409$: The direct effect of MT on PM is not significant.

BE: $\beta = 0.4134$, $p = 0.0003$: A significant positive effect, indicating that higher BE leads to increased PM.

CB: $\beta = -0.3381$, $p = 0.2138$: The direct effect of CB is not significant.

Interaction (MT × CB): $\beta = 0.1155$, $p = 0.1187$: The moderation effect of CB is not significant.

Conditional Direct Effects of MT on PM

The direct effect of MT on PM varies based on the levels of CB.

At CB=3.0 $\beta = -0.0075, p = 0.9422$ (Not significant)

At CB=3.5 $\beta = 0.0502, p = 0.5468$ (Not significant)

At CB=5.0 $\beta = 0.2235, p = 0.0410$ (Significant)

This indicates that the direct effect of MT on PM becomes significant only at higher levels of CB.

Indirect Effect of MT on PM through BE

Indirect Effect ($\beta = 0.1782$): Significant as the confidence interval (CI: [0.0842, 0.3047]) does not include 0.

Completely Standardized Indirect Effect ($\beta = 0.2286$): Also significant (CI: [0.1116, 0.3806]).

This implies that BE mediates the relationship between MT and PM. A higher level of MT positively influences BE, which in turn improves PM.

Interpretation

Market Trends (MT)

MT directly affects Brand Engagement (BE), which is crucial for improving Personalized Marketing (PM).

The direct effect of MT on PM is dependent on Consumer Behavior (CB). MT becomes significant for PM only when CB levels are high (CB = 5).

Brand Engagement (BE)

BE plays a critical mediating role in the relationship between MT and PM. Companies that succeed in leveraging MT to boost BE will see improved PM outcomes.

Consumer Behavior (CB)

CB moderates the direct effect of MT on PM. When CB aligns with MT (at high levels), MT significantly boosts PM. However, the moderation is weak overall.

Strategic Implication

Focus on improving brand engagement as it serves as the bridge between market trends and personalized marketing success.

Tailor marketing strategies based on consumer behavior levels to maximize the effectiveness of market trend adoption.

Limitations and Suggestions

Limitations

There are a number of constraints to take into account, even if this study offers insightful information about tailored digital marketing and how it affects customer behavior and brand engagement. First off, even while the sample size of 102 participants is diversified, it might not accurately reflect all global consumer categories, especially in emerging economies like Pakistan. Convenience sampling further raises the possibility of bias because more readily available and responsive individuals might not accurately represent the behaviors of the general population. Additionally, the study's dependence on self-reported information from structured questionnaires may have resulted in response biases, where participants gave answers that were more socially acceptable than accurately reflecting their opinions and behaviors. Furthermore, the study used a cross-sectional design, which restricts the capacity to make long-term causal inferences. More information about the long-term impacts of tailored marketing tactics on customer behavior and brand loyalty may be available through longitudinal research.

Suggestions

To improve the findings' generalizability, future research should try to use random sampling and enlarge the sample size. A larger representative sample of respondents from various geographic, cultural, and economic backgrounds might improve the external validity of the study. Future studies should use behavioral data or run tests to see actual customer behavior in response to tailored marketing tactics in order to remove the possible biases in self-reported data. Furthermore, longitudinal research is recommended to evaluate the long-term impacts of tailored marketing on customer loyalty and brand engagement. Examining particular industry sectors (fashion, technology, or healthcare, for example) may also yield more profound understandings of how customized marketing approaches differ in various marketplaces. Last but not least, future studies must take into account how new technologies like augmented reality and artificial intelligence affect tailored marketing and how it affects customer behavior.

Conclusion

This research highlights the critical role of personalized digital marketing in influencing consumer behavior and fostering brand engagement within the dynamic context of Pakistan. By examining the interplay between personalized marketing strategies, emerging market trends, and evolving consumer expectations, the study provides valuable insights for businesses aiming to optimize their digital marketing efforts. The findings emphasize the importance of aligning marketing practices with consumer preferences, technological advancements, and ethical considerations to build trust and loyalty. Moreover, the study underscores the need for a data-driven approach that balances personalization with privacy, ensuring sustainable consumer relationships in an increasingly competitive marketplace. These insights not only contribute to academic discourse but also offer practical recommendations for businesses seeking to thrive in the evolving digital landscape of developing economies

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**Firm Performance and Donation Payout as Predictor of Share Value through
Moderating Effect of Corporate Philanthropy**

Dr. Muhammad Usman

Hailey College of Banking and Finance

Zeeshan Iqbal

Hailey College of Banking and Finance

Dr. Samar Rahi

Hailey College of Banking and Finance

Abstract

This study examines whether share price is being affected from firm performance and dividend payout. Inquiry over the facts was also made over firms that are better in their corporate philanthropy (CP) and also performing better in a growing numbers to attain or sustain their share value. The study describes that companies who are social oriented, considers the short term objectives in concentration or more responsible have positive impacts on their share values. The study was based on data collected and contributed through 25 Public Listed Companies (PLCs).

Keywords: corporate philanthropy; financial performance; share value; dividend payout

1. Introduction

The term corporate philanthropy (CP) is not recent; however, its definition and content has been expanded gradually through the development of the historical background, and differs greatly from its original meaning. Corporate philanthropy gradually becomes a marked momentum, as an ever-growing phenomenon of global importance, and it is also of great concern of researchers (Gautier and Pache, 2015). Quite frequently, (CP) is confused with (CSR) but it's not as it seems to be. Corporate social responsibility (CSR) has gained significant attention in recent years as firms are increasingly called upon to contribute to social causes. While CSR initiatives, especially philanthropic donations, are often considered as part of a firm's long-term strategy, their immediate impact on firm performance and shareholder value remains a subject of debate. Confusion or uncertainty is more prevalent in countries like Pakistan, accepting in the literature world. In real terms both refers to the same source but CP is a slice of largest pie which is CSR. CP is way to return its regional or national/ local community through donations in the form of finances & money free assistance e.g. skill, time & physical goods such as food, clothing, medicine, books and computers. On the other hand CSR covers wider areas above from the CP.

Corporate Philanthropic Response (CP) has been a subject of considerable academic discussion and recently there have been more problems around the CP. Many of the discussions on the CP have paid extra attention on activities with socially responsible elements should trigger increase in shareholder's value or else they just eat resources of the firms without proper paybacks. Usually, there exist two separate views over considerations of the CP. In first view point; companies should only attend the CP when

the cost of doing so higher the value of shareholder (or the profit is higher than the corresponding price), and the second point of view is that companies might invest which can benefit society even when the shareholder's value decreases (Moser et al. 2012). However, current theories and experimental studies get controversial evidence regarding the relationship between CP and firms value. This paradox stimulates research inquiries that: whether performance of CP makes the quality of financial performance and Share value?. Financial reporting investment provides the basis for policy decision by public and high quality financial reporting can increase the company's value. . In this way, CP attracted a lot of attention to earnings from high profits. The previous study has followed the interests of the agency's theory, which suggests that the manager is working automatically and only CPs when they benefit Corporations spend in CP to disguise their manipulation of income which negatively affect the financial reports quality (Prior et al., 2008). In addition, philanthropy is deeply influenced by cultural and religious teachings, that is, people with more fortunate conditions have a responsibility to help others who are less fortunate or are going through a difficult period (Feliu and Botero, 2016).

In contrast to the Agency theory, other researchers have suggested the theory of stewardship, arguing that managers are oriented towards organization. This perspective explains why managers apply CP actively when there is no short-term return on investment. This view has been employed to re-examine the relationship between CP and the quality of financial performance. Previous study specifies that the quality of corporate governance and movement of corporate governance affects the financial performance and corporate social responsibility. Our results have added the literature by two different means. 1st one is for viewing CP as being provoked by business managers (for which our findings are steady with the recommendations of existing scholars) and for the sake of ethical encouragements for the sake of stake holders. Contrasting to the standpoint that CP actions of businesses that makes much of share holders' value [-1, 2]. 2nd, results conclude that shareholders' value is not linked to CP but ethical behavior of managers can positively be linked with CP and financial performance standards.

2. Literature Review &- Hypothesis Development

There is a growing need for a CP relationship especially with financial performance. Accounting & finance investigators have achieved major results in CP results. The performance and disclosures of CP are related to the risks of business risk, information and cost of debt stock investment value (Cao, Y.; et al. 2014), internal trading profits and forecast predictions (Dhaliwal, D.S 2014). The study also initiated that CP act is positive about customers' loyalty, commitment, confidence, retention and productivity along with firm's corporate image and reputation. Although a large number of examinations of the relationship between CP and financial reporting standards exist, but results of the first study are either mixed or linked to their data sources. Firm performance is widely recognized as a crucial determinant of stock market behavior. Financial performance indicators, such as return on assets (ROA), return on equity (ROE), earnings per share (EPS), and profit margins, often correlate with stock price movements. (Kim, Y et al. 2012). By means of data for two years only, the best corporate citizenship institutions have a more consistent and seamless income than others. Regardless of the scope of the data, (Kim, Y et al. 2012). CP and the optional medium (the most commonly used standard for financial reporting standards) did not obtain any significant relationship. By

means of having a long plate of ten years of financial reporting standards, researchers also found out results with mixed combinations. (Lakshamana 2009). Rather than its results, was largely associated with financial reporting standards (CP) CP, in relation to the weakness of CP, there is a relationship between power. From 2006 to 2015 using data from 226 corporate CP companies, 13 and identified the relationship between CP and income-related activities. Non-family more than family members Compared to families, family-oriented companies use CP detection devices to change the public interest of unhealthy standards of financial reporting. Other two researches also supported the concept that CSR activity may be a problem in an agency with managers and companies. According to the analysis, the number of returns provided by analysts is low for corporate CSR drilling companies where analysts believe that contributions to the CSR do not engage better reward for shareholders therefore failure to attend activities to stop companies. The moderate role of CP in managing profits and measured value (measured by capital costs) is also found and exploits companies to meet their weak financial reporting standards it can be a tool for CP. (Martinez-Ferrero et al. 2016). The above studies have identified the fact that contributions to the CSR are incentive for business managers to conceal management of profits. Evident from studies; that CP activities are positively correlated to the manager's ethical conduct. Studies proved that participation into CP activities is also linked with manager's moral development, which supports the idea that activities relevant to CP are ethical encouragements in order to care the society or community. The results reached in also uncovered the facts that the best corporate CP companies were to be investigated by SEC (Securities & Exchange Commission) for breach of GAAP and also have low volume of propensity for bad information concealment (Laksmana, I 2009). If CP activities are related up to the extent of intentions of managers' to manage firm's net profits, then it is expected that by doing the same will not increase from the penalty cost resulting from unhealthy standards of financial reporting. Last but not least, business executives may not be faithful for demonstrating the CP performance up to the extent of having problem in managing the earnings on regular basis. However in case, activities of CP are linked to ethical incentives of the managers to serve for society then it can be expected from them to have increased participation ratio in activities related to CP even if having no intentions to conceal profit management. In order to have solution of this problem or puzzle, those companies were chosen which were having highest performance in CSR which were ranked on the top during the research period out of lists from PLCs. CSR practices are not always an **indicator** of ethical behavior (Metwally, A. B. M 2024). Therefore, we say that companies with superior performance. In the field of corporate social responsibility have fewer encouragements to participate in profit management activities (Lakhal, F. 2023).

Hypothesis

Hypothesis 1: Higher firm performance is linked to healthy standards of share value.

Hypothesis 2: Corporate Philanthropy moderates the relationship between firm performance and share value

Hypothesis 3: Higher dividend payout is linked to healthy standards of share value.

Previously, the value of research earnings has been used in different ways i.e. flow of steps Matrix which was already utilized in early section. By means of reflective market

metric for other flow earnings in the way. Especially “Dhaliwal et al” estimated the facts that revenue response coefficients are higher for organizations with CP activities. However, in this study different market metrics was used in their relevant studies. Authors path was followed who improved their studies, which kept the investors' perception of the earners. Before the relationship between CP and a firm's quality proved experimental experience. The authors of positive relationships, who find positive relations between CP publications, volunteer carbon emissions reveal and measurement by reserves.

CP performance and the bonds of bonds and production of companies are positive relations between and stock returns (Schneider 2011, and Luo X 2014). When high profile abuse occurs, CP reports are registered to the issuing companies for experiencing less negative damages than their stock price, which does not publish CP reports (Christensen, D.M 2016). CP performance negatively impacts business risk data discrimination (Ge, W, 2015), loan costs (Cao et al. 2012) equity capital expenditure and analyst forecasts errors (Manchiraju et al. 2017, Cao et al.2014). These results show that CP activities can strengthen the company's commitments, which can help reduce the inequality of information which is more likely to be useful to stakeholders instead. And will also decrease the costs and associated risks with improvement in shareholders and financial standards. In contrast to that, CP has located some negative linkages among performance & stock returns which has supported management of CP activities to manage shareholders' interests at the cost of shareholders (Krüger, P 2015).

The cost of CP activities 4.1% discount on their stock price. (Lys, T.; 2015). No relationship was found between CP and risk-adjusted stock returns. (Humphrey, J.E. 2012). Finally, The CP expense levels are only related to the size-adjusted future stock returns we examined the relationship between the revenue response assistant (CRR) and the CP performance to see if the CP rankings are to increase the relevant stock price or future relevant revenues. (Dhaliwal, D.S.; et al. 2011). It is assumed that if CP is considered to be performance-related activity (for example, revenue growth quality), they will give more weight to the income received by the best CP ranking firms compared to others.

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2.1 Theoretical Framework

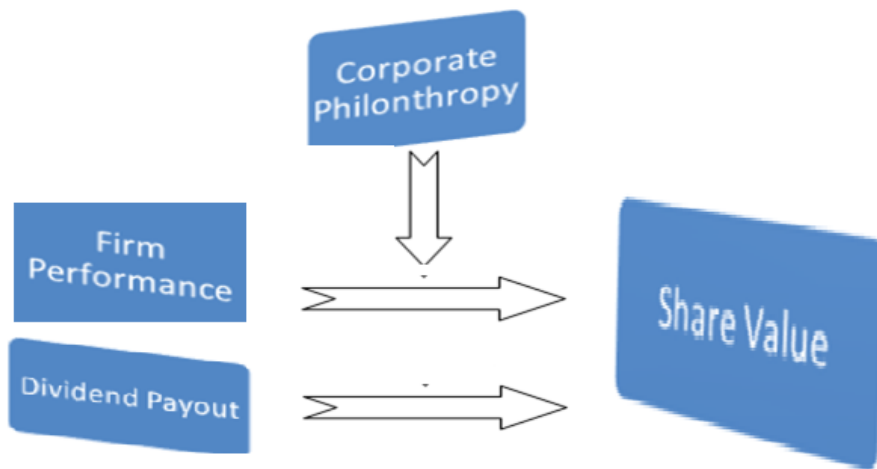


Fig 1.1

Variable Structure:

Variables	Proxies
1. Share Value	Closing Share Price (SP)
2. CSR CP (Corporate Philanthropy)	Donations (D)
3. Firm Performance	Earnings Before Tax (EBT)
4. Dividend Payout	DPO

Methodology:

For examining the hypothesis it is necessary to analyze the collected data to reach at the conclusion regarding the research questions of this study. This section shows the analysis conducted using STATA on collected data of 25 companies and their interpretation.

```
. summarize YEAR COMPANYCODES DONATIONS SHAREPRICE PROFITS DIVIDENDPAYOUT MODIFIER
```

Variable	Obs	Mean	Std. Dev.	Min	Max
YEAR	125	2014	1.419905	2012	2016
COMPANYCODES	125	1013	7.240121	1001	1025
DONATIONS	125	2.46e+08	4.01e+08	6.37e+07	2.11e+09
SHAREPRICE	125	321.3212	471.7045	8.566665	1980
PROFITS	125	2.10e+10	2.44e+10	2.40e+08	8.25e+10
DIVIDENDPA~T	125	8.48e+09	9.87e+09	7.77e+07	3.54e+10
MODIFIER	125	9.67e+18	3.00e+19	2.07e+16	1.70e+20

Table 1

This study is conducted by using secondary data related to Firm Performance, Donations and Share price of 25 companies consisting panel data of 5 years. Data is examined through STATA by running Correlation and Regression Analysis. Table 1 shows the mean, standard deviation and minimum maximum values of collected data. Share price mean is 321.3212 which are the average score of this variable having standard deviation 471.7045. Donations mean is 261783 having standard deviation 424376.3. Firm Performance is examined through profits. (Callen, J.L.; Khan 2012) Profits show the mean value 1013 and standard deviation of 7.24. Out of 125 observations of donations missing value data is 15. It is because some companies did not give donations in 2 to 3 years.

```
. correlate COMPANYCODES DONATIONS SHAREPRICE PROFITS DIVIDENDPAYOUT MODIFIER
(obs=125)
```

	COMP~DES	DONATI~S	SHAREP~E	PROFITS	DIVIDE~T	MODIFIER
COMPANYCODES	1.0000					
DONATIONS	0.2745	1.0000				
SHAREPRICE	0.1820	-0.0340	1.0000			
PROFITS	-0.1417	0.4634	-0.0762	1.0000		
DIVIDENDPA~T	-0.1148	0.5146	-0.0802	0.9888	1.0000	
MODIFIER	0.1933	0.9472	-0.0755	0.5621	0.6109	1.0000

Table 2

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. xtreg SHAREPRICE PROFITS DIVIDENDPAYOUT DONATIONS MODIFIER, re						
Random-effects GLS regression	Number of obs		=	125		
Group variable: COMPANYCODES	Number of groups		=	25		
R-sq:	Obs per group:					
within = 0.2477	min =			5		
between = 0.0001	avg =			5.0		
overall = 0.0001	max =			5		
				Wald chi2(3)	=	.
corr(u_i, X)	= 0 (assumed)	Prob > chi2		=	.	

SHAREPRICE	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
PROFITS	4.44e-09	2.08e-09	2.13	0.033	3.61e-10	8.52e-09
DIVIDENDPAYOUT	-4.12e-09	1.88e-09	-2.19	0.029	-7.81e-09	-4.31e-10
DONATIONS	9.31e-07	2.79e-07	3.33	0.001	3.83e-07	1.48e-06
MODIFIER	-7.05e-18	2.20e-18	-3.20	0.001	-1.14e-17	-2.73e-18
_cons	102.0635	120.1548	0.85	0.396	-133.4357	337.5626
sigma_u	519.19045					
sigma_e	23.959071					
rho	.99787498	(fraction of variance due to u_i)				

Table 3

The given above table shows the correlation and significance between dependent and independent variables which explains the correlation and direction of variables association that whether its positive, negative or neutral and also shows the intensity of relationship. Profit has Pearson correlation value of 0.033. It shows that Profit and Share value is significantly correlated because the value is less than the significance level. Likewise dividend payout has Pearson correlation value of 0.029. It shows that Dividend Payout and Share value is significantly correlated. Donations have 0.001% p-value. This shows that there is positive significant correlation between donation and firm performance. The moderating role of Corporate Philanthropy is examined by creating modifier variable (Firm Performance*Corporate Philanthropy). R² is 25% which is not good. It is because many other important variables exist which have a strong impact on share value that are not included in model.

4. Discussion and Conclusions

Present discussion of the study has scrutinized the relationship among firm performance, dividend payout and value relevance of share value by twenty five (25) PLCs. Data of 25 companies of 5 years has been collected from Pakistan Stock Exchange (PSE) and one private website. It has been proposed on the basis of previous literature studies that CP performance tends to significantly & positively associated with the firm performance of company and FP is ultimately positively related to share value of the company prevailing in the market. Extra added tests supported our key findings that there is positive significant relationship between firm performance and share value.

However Corporate Philanthropy moderates the relationship between firm performance and share value. Yet if the firms which are performing better in CP may have a better firm performance because CP activities like donation increase the marketing of companies and it encourage the shareholders to invest more in those firms to add more value to the firm's share price. So it tends to be proved that firm performance maximization is triggered through Corporate Philanthropy which is also a booster of Share value.

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Unlocking Business Potential through Digital Transformation: Leveraging AI and Design for Enhanced Performance

Muhammad Ubaid

BS Management and Technology Department, Faculty of Business and Management,
Information Technology University, Lahore, Pakistan

Dr. Muhammad Adnan Sial

Assistant Professor, UE Business School, Division of Management and Administrative Sciences,
University of Education, Lahore, Pakistan

Abstract

This study explores the relationship between artificial intelligence, design thinking, and business performance in the context of digital transformation. The population studied consisted of hundred respondents, who were selected using a convenience sampling technique. Primary data were collected through a comprehensive questionnaire distributed via Google Forms and physical surveys. The questionnaire was designed using validated scales adapted from prior studies to ensure the robustness of the data. Cronbach's alpha was utilized to test the reliability and confirmed the internal consistency of the scales. Hypotheses were tested using the Hayes Process Macro installed and run in SPSS, allowing a more rigorous examination of direct, indirect, and moderating effects. This study uses a quantitative research design with a cross-sectional approach to assess the relationships between AI, design thinking, and business performance. The results show that AI can significantly automate business processes, facilitate decision-making, and improve operations. Analogous to this, design thinking came out as the mediator for innovation and aligning technology solutions with customer needs. Altogether, these aspects ensure better business outcomes through improved revenue, customer satisfaction, and innovation capacity. It's evident from the findings of this study that strategic operations in business can incorporate AI and design thinking with enormous transformative potential. In such a manner, valuable knowledge for practitioners and researchers in the domain of digital transformation can be derived from it.

Introduction

Broad and Specific Area

In today's fast-paced and highly competitive business environment, organizations are increasingly leveraging digital technologies to adapt to rapid changes and meet evolving customer expectations. Digital transformation refers to the process of integrating digital technologies across all areas of a business, which fundamentally changes how organizations operate and deliver value to customers (Verhoef, Kannan, & Inman, 2021). Among the key drivers of this transformation are Artificial Intelligence (AI) and Design Thinking. AI enables automation of processes, predictive analytics, and enhanced decision-making capabilities, while Design Thinking focuses on human-centered innovation, emphasizing empathy and iterative problem-solving (Brown, 2009). Together, these approaches play a critical role in improving business performance, driving innovation, and enhancing customer experience. The broad focus of this research is digital transformation, but specifically, it examines the role of AI and Design Thinking in shaping business performance. Both AI and Design Thinking are essential components of contemporary business strategies, yet

the interaction between these two factors, particularly their combined influence on business outcomes, remains underexplored in academic literature.

Significance

Digital transformation is no longer a luxury but a necessity for businesses seeking long-term sustainability and competitive advantage (Westerman, Bonnet, & McAfee, 2018). As organizations increasingly adopt AI and Design Thinking, understanding their combined impact on business performance is crucial for managers and business leaders. While AI has demonstrated its potential to enhance operational efficiency through automation and data-driven insights (Nguyen & Markkula, 2021), Design Thinking fosters creativity and user-centered solutions that drive innovation and customer satisfaction (Matarazzo & Giannoccaro, 2020). However, the interplay between AI and Design Thinking in digital transformation remains largely unexplored, particularly in terms of their mutual influence on business performance. This study aims to fill this gap by investigating the contribution of AI and Design Thinking to business outcomes such as revenue growth, operational efficiency, and customer satisfaction.

Purpose

This research therefore seeks to examine the roles of AI and Design Thinking in business performance in the backdrop of digital transformation. This research will compare the mediated causal model for the direct and indirect impact of AI and Design Thinking on KPIs, including revenue increase, productivity, and enhanced customer satisfaction. Besides, the study will assess the moderating role of AI on the link between digital transformation and business performance with Design Thinking as the mediator.

Research Question/Research Problem

The central research question for this study is:

How do Artificial Intelligence and Design Thinking impact business performance in the context of digital transformation?

This main question is further broken down into the following sub-questions:

1. How does the integration of AI contribute to operational efficiency and decision-making processes in businesses?
2. How does Design Thinking enhance customer experience and foster innovation within digital transformation efforts?
3. What role does AI play in moderating the relationship between digital transformation and business performance?
4. To what extent does Design Thinking mediate the effects of digital transformation on business outcomes?

By addressing these questions, this research will offer valuable insights into the effectiveness of combining AI and Design Thinking as strategic tools for enhancing business performance in the digital age.

Literature Review

Introduction

The current scenario is highly integrated between technological elements and their use in organizations on a universal level, ranging from customer contact to all kinds of internal operations. Digital transformation is, therefore, an imperative for survival in the current scenario, as well as adaptability, which is changing with the constantly evolving digital scenario. Therefore, innovative solutions and business strategies can always be embraced. The two core aspects of this procedure are AI and design thinking, which contribute to the development of companies not only in terms of increased effectiveness but also creativity and performance.

1. Digital Transformation and Business Performance

1.1 Defining Digital Transformation

Digital transformation refers to using digital technologies to affect changes in businesses at every level, funda they operate and deliver value to their customers. It is a change not only of new tools but also a business model, changing customer experiences, and supporting the better agility of an organization in regards to responding to market demands, according to (Verhoef, Kannan, & Inman, 2021).

1.2 Impact on Business Efficiency and Revenue

Numerous studies have shown that companies that effectively implement digital transformation initiatives experience significant improvements in key performance indicators (KPIs) such as revenue growth, operational efficiency, and customer satisfaction. A study conducted by (Hanelt et al, 2021) indicates that businesses that embrace digital transformation report up to 25% increases in revenue and market share. In sectors such as retail, banking, and healthcare, digital transformation has been especially crucial, allowing companies to streamline processes, reduce costs, and create personalized customer experiences.

Another scorching case is the web-giant Amazon, which filed multiple cloud computing, big data analytics, and AI cases for optimizing supply chain efficiency, improving customer experience, and extending business activities worldwide. Innovative digital solutions transformed the online retailer Amazon into one of the most successful companies globally. For instance, an organization of a banking industry in particular, JPMorgan Chase has put work in the AI-based managing of finance systems that support clients through auto customer service, fraud detection, and risk assessment.

1.2 Challenges and Barriers to Digital Transformation

However, most organizations face considerable barriers in implementing digital transformation. Other takeoff barriers comprise resistance to change, less-than-adequate digital literacy within the employee base, and high costs of setting up. According to (Westerman et al, 2018), almost 70% of the digital transformations fail because of inertia within the organization and due to a lack of proper leadership support. Companies are sure to fail without serious investment in employee training and technological infrastructure.

2. Design Thinking as a Mediating Variable

2.1 The Human-Centered Approach

Design thinking is an innovation method placed at the core of the process of problem-solving, which allows business organizations to better understand users and identify points of pain and creative solutions to customers' needs (Matarazzo & Giannoccaro, 2020). From this viewpoint, digital transformation can place the variable of design thinking as a mediator for the necessary adjustment of the technological innovations in accordance with expectations from the customers.

In this regard, companies such as Apple and IBM have used design thinking as their foundation for decades to boost innovation and maintain customer-centric strategies. Indeed, since Apple has taken design thinking seriously, products that are both functionally sound yet intuitive and beautiful seem to appear all the time which have helped the company build a huge loyal customer base together with a fantastic global brand. Apple has integrated digital transformation with emphasis on user experience through design thinking that brings the company closer to business growth and more customer satisfaction.

2.2 Enhancing Innovation through Cross-Functional Teams

It emphasizes cross-functional collaboration in the departments. In such a scenario, designers, engineers, marketers, and product managers can work across functional teams and may come with solutions that could be not only user-friendly but sound from the aspect of technology in cases of digital transformation. Such interdisciplinarity fosters creativity and different angles of approach. It also has an opportunity to carry out iterative testing of ideas with output on products and services, which would better fit the needs of the market.

2.3 Case Studies: Implementing Design Thinking in Digital Transformation

A good example in this case is the IBM digitization transformation strategy and embracing design thinking. Because of design thinking, IBM has delivered radical solutions for cloud computing, AI, and even blockchain. In such a way, through design thinking, IBM has transformed the tough technological systems into products that can be used by more people who will need them.

(Matarazzo & Giannoccaro, 2020) have further researched to acquire claims on the existence of the role thinking designs play in the success of initiatives for digital transformation. In the report, a company who realistically merged design thinking into the work of digital transformation achieved a higher level of customer satisfaction and work efficiency.

3. Artificial Intelligence: Catalyst for Digital Transformation

3.1 AI and Automation

Evidently, one of the biggest transformative technologies in the sphere of digital transformation will be AI. This is because of automation of routine processes, vast data analysis and predictive insights whereby businesses can develop greater efficiencies in running their operation and make decisions depending on data availability (Nguyen & Markkula, 2021). AI will impact business processes from automated customer service chatbots to optimizing how the supply chain is run.

For example, AI Chatbots such as the ones on e-commerce sites, for example, Alibaba can provide real-time customer support answering queries and processing transactions-without human intervention hence running throughout 24/7. Likewise, the applied predictive algorithms in the manufacturing sector help firms predict breakdowns of equipment and minimize the loss of time and time turns into money.

3.2 Enhancing Customer Experience through AI

Perhaps AI's greatest contribution to this digital transformation is its ability to personalize the customer experience. For instance, the recommendation engines that AI has created on Netflix and Spotify analyze varied patterns of user behavior to give actual recommendations, thus increasing user engagement and satisfaction. Those platforms will use machine learning algorithms that may enhance or boost their recommendations to become more relevant to users over time.

3.3 The Role of AI in Decision-Making

But beyond operating efficiency, AI is also critical to improving decision-making. AI identifies complex patterns and trends in large datasets that are too massive to be noted by the average analyst. It might therefore be seen, for example, that AI-driven algorithms in financial services were applied for the evaluation of credit risk or detection of fraud or optimization of investment portfolios. Such technologies help businesses make better decisions and to reduce risks and perform better generally.

4. Emerging Technologies in Digital Transformation

Other than AI and design thinking, other emerging technologies of basic significance to fast adoption of digital transformation in industries are cloud computing, blockchain, and the Internet of Things (IoT). Actually, they have expanded scope and impact in digital transformation. It supports business operations through scalable solutions, enhances transparency, and offers real-time data to optimize the processes of decision-making.

4.1 Cloud Computing and Scalability

The new methodology with elastic, scalable, and cost-effective answers in terms of data storage and management would shake the current business landscape's functionality in the near future. Indeed, real-time access and processing of data allow organizations to shift from the old premise-based traditional model to the cloud-based services that significantly lower operating costs and scale up as explained by (Marston et al, 2020).

For instance, companies such as Netflix and Dropbox mainly depend on cloud computing to process huge amounts of data and serve millions of customers spread across different regions of the world. Cloud computing's scalability allows businesses to respond to demand without identifying capital reserves. In the paradigm of digital transformation, cloud computing will provide a basic support base for more benefits through AI, big data analytics, and machine learning, resulting in better decision-making in operations.

4.2 Blockchain and Transparency in Operations

This technology was first the basis for cryptocurrencies like Bitcoin. Today, it has become the most important tool to amplify transparency and security in the business world. It is realized through decentralized and tamper-proof ledgers where the transactions are secure and transparent. It is pretty applicable to supply chain management where tracing products and establishing whether they are authentic is required.

For example, blockchain really streamlined processes of verification and validation and cut the time required with a corresponding cut in the cost of intermediaries in the domain of digital transformation. IBM-based blockchain-based Food Trust enables all stakeholders involved in the food supply chain to trace back the products from the farm to the table for food safety purposes while reducing the risk of fraud by increasing the efficiency of operations and enhancing trust with customers through provision of verifiable records of origin.

4.3 Internet of Things (IoT) and Real-Time Data

IoT has been defined as the network of all connected devices collating and sharing data over the internet. It actually means everything-from home automation systems to industrial sensors; it is also concerned with real-time data that can monitor, control, and optimize every business operation. In the context of digital transformation, IoT would be understood to give insight on customer behavior and operational performance that is to be quite meaningful to understand the status of the equipment.

Examples include this: IoT sensors in the manufacturing track the performance of the equipment, and predictions as well as the replacement of the needed maintenance before failure will be done. All these reduce time lost and boost productivity. Retail companies use IoT in monitoring the inventory and movement of customers in stores to provide proper management of the inventory as well as personalized marketing. Live data created by IoT devices can be integrated with AI and the machine algorithms for effective predictions and improving the decision-making system.

5. Case Studies of Successful Digital Transformation

5.1 Retail Industry: Amazon's Digital Transformation Journey

In most of the study and paper, Amazon is positioned at the spearhead of digital transformation since it can exploit and apply new emerging technologies to optimize business processes for greater customer experience. From its use of cloud computing, AI, and data analytics, it dominated the e-commerce sector and then diversified into other diverse fields, such as cloud services (AWS) and digital entertainment (Prime Video).

The very significant aspect about Amazon is personalization of the shopping experience since it makes use of AI to analyze its customer's data for the recommendation engine. Based on browsing and purchasing history, this recommendation engine tries making suggestions to customers about what they would like, hence enhancing the sales and loyalty levels of its clients. One of the areas is efficiency, as Amazon's IoT devices and AI-powered robots placed in its warehouses can help achieve optimization in supply chains by automating the picking, packing, and shipping of operations.

5.2 Walmart: IoT and Big Data in Retail

Another very notable example is Walmart, which took the transformation to its advantage digitally to metamorphose its operations as better improvement and further propel the customer experience. Walmart has utilized IoT, big data analytics, and AI to streamline supply chains, remove waste and personalize the experience of its shopper (Ghobakhloo, 2020).

This consequently leads to the fact that by installing IoT sensors in its warehouses and stores, Walmart can monitor on time the availability of its products. The information obtained from the sensors filtered through AI algorithms can predict some demand on the supply chain for management optimization. Through this, Walmart has diminished some wastage, hence, costs, and it now increases efficiency (Davenport & Ronanki, 2018).

Such implementations also exist on the side of AI-powered chatbots and recommendation engines, in further ways to enhance online shopping experience. These allow making recommendations to customers on product purchases that increase customer satisfaction and conversion rates (Schmidt & Wagner, 2019).

5.3 Mayo Clinic: AI in Healthcare

Mayo Clinic is among examples showing how health care can be transformed using digital transformation. This happens by incorporating AI and other innovations in ensuring patient outcomes and working effectiveness are improved. Health service provider Mayo Clinic used AI algorithms to assist doctors to make diagnoses, analyze medical images, and predict the results of treatment for patients (Nguyen & Markkula, 2021).

The innovation Mayo Clinic uses in the field of radiology is this application of AI. This signifies that AI systems analyzed images for the better and earlier diagnosis of diseases, such as cancer, which is another aspect further enhancing and accelerating the accuracy of diagnosis (Davenport & Ronanki, 2018). This would not only lead to better patient care but also free up physicians to address other complicated cases.

On the other side, the Mayo Clinic supported telemedicine and virtual care. AI-powered chatbots and virtual assistants brought personalized health recommendations to patients' doors. This made the clinic's service reach broader and offered healthcare services to remote areas (Nguyen & Markkula, 2021).

6. The Future of AI and Design Thinking in Business

All of this means that in the near future, business leaders will also keep right on with their drive to digitalize their firms. This will bring AI and design thinking ever more into the foreground of defining industry futures. Together, the technologies can produce new ideas, enhance customer experience, and improve operational efficiency.

6.1 AI-Driven Innovation

AI is more probably going to present opportunities for innovation and rather will be at the centre of future technologies in healthcare, finance, and manufacturing, among other industries. As more advances are rolled out in machine learning, natural language processing, and computer vision, businesses will be able to come up with more intelligent products, automate complex processes, and make accurate predictions (Ransbotham et al., 2017)

For example, manufacturing already uses AI-powered robots to speed up the production cycle, and on the analytics side, AI-driven analytics platforms help a business make sense of vast amounts of data to define insights and drive strategy. In healthcare, AI algorithms are now being designed for developing customized treatment plans based on patient data. This proves to better outcomes and lower costs also as well (Nguyen & Markkula, 2021).

6.2 Design Thinking in the Age of AI

With increased application of AI in business, the design thinking process will become an essential activity to ensure that their AI-driven solutions are user-centered and meet customers' needs. The more a business is centered on users, the more likely they will develop the AI technologies that can deliver value to end-users (Matarazzo & Giannoccaro, 2020).

Design thinking encourages innovation in business through iterative, human-centered activities. This is why AI solutions are not only functional but also intuitive and easy to use. The key to retaining competitiveness in such a rapidly changing digital landscape is the combination of AI and design thinking.

7. The Future of Digital Transformation: Trends and Predictions

As the business world is rapidly being paced towards digital transformation, there is a need to find out what the future holds for its growth. Other emerging trends include one such as the democratization of AI, hyper-automation, and edge computing. These will change the way an organization embraces digital technologies in its operations. The above trends will not only improve efficiency in the operation but redefine how businesses interact with their customers and markets.

7.1 Hyper-Automation

A huge trend in hyper-automation is brought in this aspect to accelerate the speed of digital transformation by bringing AI, robotic process automation, and machine learning together, empowering companies to enable automation of really complex business processes (Davenport & Ronanki, 2018). Unlike automation, which has been in use for decades to make routine and repetitive tasks more efficient, it goes further to apply advanced AI algorithms for the execution of more complex processes.

According to Nguyen and Markkula (2021), hyper-automation is more than just the automation of repetitive work, but decisions are also improved by leveraging AI for analyzing vast datasets and recognizing patterns. An application of hyper-automation within the finance sector is the automation of fraud detection systems and credit risk assessments and optimization of an investment portfolio.

The foremost benefit that hyper-automation presents is its contribution toward business agility. By automating complex processes, organizations reduce the time it takes to bring a product or service to market, thus enabling organizations to respond better to shifting demands from customers and in the marketplace (Ransbotham et al., 2017).

7.2 Edge Computing

Another emerging pattern in digital transformation is edge computing. It refers to the processing of data closer to the source instead of as centralized data centers. Latency is decreased along with efficiency in data-driven decision making by industries that thrive on real-time data, including manufacturing, healthcare, and autonomous vehicles. According to (Schmidt & Wagner, 2019), end.

This is particularly beneficial for IoT applications, since with this technology, a large amount of data must be processed in a real-time environment to achieve peak performance. For example, on a smart factory level, sensors are connected with equipment in real time, and edge computing processes local data to predict maintenance needs and avoid equipment failures, according to (Ghobakhloo, 2020). More importantly, by processing at the edge, organizations are able to reduce time-to-decision for critical operations, bringing an improvement in operational efficiency and cost-cutting.

Edge computing will also help ensure better data privacy and security. Data processing close to its source will decrease the opportunity for tainted information to be sent to central servers since it violates or gets interfered with in transit (Jin et al., 2015). This is important in industries such as health care, where patient data needs to be protected in order to adhere to certain regulations, like HIPAA.

7.3 Democratization of AI

It has been aptly described as Democratization of AI, where AI tools and technologies get to reach a greater number of users, such as non-experts and smaller businesses (Fitzgerald et al., 2014). This is further spurred by the cloud-based AI services that are gaining popularity and AI platforms aimed directly at the business user, making it easy to embed AI capabilities throughout operations without necessarily requiring special expertise.

For example, Google Cloud AI and machine learning services offers pre-built AI models that business organizations can adapt and deploy without necessarily having to have an in-house AI team (Marston et al., 2020). Democratized AI democratizes the power of business organizations of all sizes, making it easier for smaller companies to be able to compete effectively with larger enterprises.

The democratization of AI further encourages innovation because more companies are able to play around and test AI-based solutions. The more organizations have access to AI tools, the more they are likely to develop applications and use cases that prop up further advancement in the field (Davenport & Ronanki, 2018).

8. Challenges Facing the Future of Digital Transformation

8.1 Ethical Concerns Surrounding AI

The introduction of AI in business processes will also be accompanied by ethical issues regarding its use. Probably, the most common ethical dilemma will be the assurance that AI systems are fair and transparent, ensuring they do not suffer from biases (Ransbotham et al., 2017). In most cases, AI algorithms rely on training historical data which may already have embedded biases in some

cases. This may simply be that AI, trained on discriminatory data, surrenders to bits of gender or racial bias in hiring procedures (Nguyen & Markkula, 2021).

Hence, firms need ways to audit and monitor AI systems so that they are not misused. This means the development of such frames that analyze the fairness of AI models, provide mechanisms for transparency, and then devise processes for detecting bias and mitigating it (Davenport & Ronanki, 2018).

Apart from all those ethical dilemmas, AI can replace jobs, particularly in industries where most of the workforces can be mostly automated by AI. On one hand, AI promises to produce new opportunities; however, it generates fear regarding work's future with reskilling and upskilling workers effectively for such an environment (Schmidt & Wagner, 2019).

8.2 The Digital Skills Gap

One of the major factors driving the successful implementation of digital transformation is a work force with the right kind of digital skills; however, a gap in digital skills prevails in most organizations because the majority of employees lack knowledge and expertise to adapt and use new technologies smartly (Westerman et al., 2018). As (Bughin et al, 2018) report, businesses that don't make a move in a seamless digital skills training program will undoubtedly face a barrier in their transformation efforts.

To this extent, organizations have to invest in training programs that allow for better equipping and preparation of employees so that they can thrive in a digital work environment. Areas such as training courses on AI, data analytics, cloud computing, and so on should be investments for the businesses (Fitzgerald et al., 2014). In addition, efforts from the organizations should be made towards the creation of a continuous learning culture in which an individual is encouraged to develop new skills and keep pace with the latest technological advancements (Ghobakhloo, 2020).

8.3 Environmental Impact of Digital Technologies

Though digital transformation has several benefits, it has a few concerns in terms of environmental impacts. The growth of data center and cloud computing has further increased the Internet of Things devices, causing the increasing electricity consumption and electronic wastes (Marston et al., 2020). One of the biggest challenges in the carbon footprint of digital technologies is the energy used for powering and cooling servers in the data center (Jin et al., 2015).

These concerns can be met only by making corporate internet business more sustainable in any way that they embrace through their digital transformation. They include investment in energy-efficient technologies, renewable energy sources to power data centers, and the embracement of circular economy principles in reducing electronic waste (Schmidt & Wagner, 2019). More, businesses can play a crucial role in minimizing the negative impacts of digital transformation on the environment while still reaping its benefits from technological innovation.

9. Implications for Business Strategy and Leadership

Thus, reshaping industries through digital transformation deepens the implications for business strategy and leadership. New technologies need to be embraced by organizations but require a reconsideration of their overall strategies and leadership style to thrive and survive amid the

complexities of the digital era. Agility and continuous learning are particularly part of the culture that businesses must develop to keep up with changes in technologies. Leaders play a very critical role in steering efforts for digital transformation as well as positioning organizations to take maximal advantage of emerging technologies.

9.1 Strategic Alignment of Technology and Business Goals

The primary challenge organizations face on their journey to digital transformation is the alignment of technology adoption with their overarching business goals. Digital transformation cannot be a single IT initiative but, rather an integral component of the organization's overall strategy (Westerman et al., 2018). A holistic approach to successful digital transformation necessitates reflection on how technology can enable business objectives, such as enhanced customer experiences, better operational efficiency, and revenue growth.

For example, take the case of Netflix and Amazon. They have recently portrayed the strategic value of alignment by seeding AI and cloud computing in every strand of the business model to reach out more effectively to customers as well as to make the tasks much more easier to control (Amazon Web Services, Inc., n.d.). These organizations managed to expand at incredible speeds and sustain leadership in the marketplace by aligning digital initiatives with business objectives.

At the same time, the role of data in decision-making processes is even more crucial for any organizations' digital transformation strategies. Organizations have to build the capacity to extract, process, and use data to create the right insights and inform strategic decisions (Ransbotham et al., 2017). Business operations can detect trends and determine future demand through better-informed strategic choices, thus improving their competitiveness.

9.2 Leadership in the Digital Age

Leadership will play an important role in effective digital transformation. Effective organizational change, a culture of innovation, and leading over technology resistance require organizational leadership, (Bughin et al, 2018) state. Leaders would have to champion the digital initiatives while enabling their teams with necessary skills and resources to adopt the new technologies.

In the digital space, agile leadership is needed; that is to say, it will be flexible, adaptive, and willing to test out new ideas (Fitzgerald et al., 2014). Agile leaders encourage their teams to take measured risks and to learn from failure while incessantly iterating towards a solution. It resonates with the ideas put forward by design thinking with principles concerning iterative problem-solving and user-centric innovation (Matarazzo & Giannoccaro, 2020).

They need to put much emphasis on constructing digital competencies in their organizations. Considering that gaps in digital capabilities are as yet a major mover of hindrance in turning transformational successfully, leaders have an investment in the right training programs which empower personnel to build expertise in AI, data analytics, or cloud computing. Through fostering cultures of life-long learning, leaders can create their organizations' ability and the infrastructure to handle the vast complexities of the digital landscape.

9.3 Fostering a Culture of Innovation

Digital transformation thrives in an organizational culture focused on innovation and collaboration. Google and Apple, for example, have a history of experimenting culture where employees encourage thinking outside the box, test new ideas, and poke holes in the status quo (Matarazzo & Giannoccaro, 2020). Such a culture fosters innovation, which enables such organizations to be at the cutting edge by constantly introducing new products and services of value to customers.

A culture of innovation is broken departmental silos and cross-functional collaboration. As opined by (Nguyen and Markkula, 2021), design thinking contributes to invaluable interdepartmental collaboration since it brings teams together for the co-creation of solutions towards technology-based and customer-driven solutions. The joint approaches presented more innovative and user-centric solutions that would drive business growth within an organization.

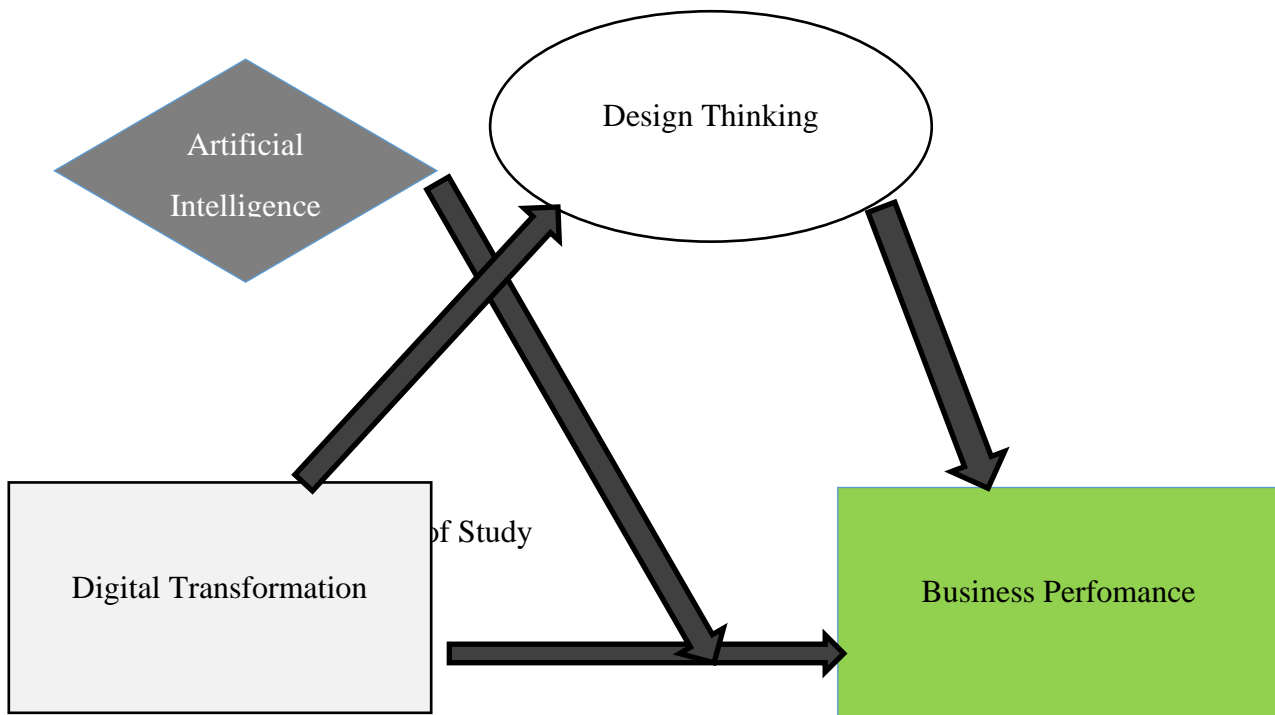
Second, innovation has to be embedded in the organization's very blood. It occurs by allowing employees to have time, resources, and space to tinker with ideas. 3M and Google have implemented "20% time" policies that enable employees' working hours to be allocated each week to side projects that may interest them. Initiatives of this nature often push out breakthrough innovations that eventually pay out for the company (Fitzgerald et al., 2014).

9.4 Agility and Continuous Improvement

Today, organizations are being called upon to embrace agile mindset in this fast-paced digital world and in the changing nature of conditions in markets and technologies. Agility means quickly responding to change, pivoting, iterating, and improving with feedback and data-driven insights (Westerman et al., 2018). Agile practices in Scrum and Kanban make an organization more responsive to complex projects, help reduce time-to-market, and enable them to deliver greater value sooner to the customer.

For example, Spotify has used agile methodologies to develop its product. This enables the firm to frequently come out with new features and updates of the platform. Agile practices by Spotify have helped it to stay at the top position in the music streaming industry while improving continuously in response to user feedback.

Agility has to be embraced as it forms a root principle of digital transformation. Organizations have to track the effectiveness of their digital initiatives and align them according to performance needs. This helps organizations to be agile and responsive to their customer needs. As (Davenport & Ronanki, 2018) conclude, "digital transformation is a compounding effect as it becomes a self-reinforcing cycle of learning".



H1: Digital transformation (DT) has a positive impact on business performance (BP).

This hypothesis suggests that the adoption of digital technologies and processes within an organization will lead to improvements in key business performance indicators such as revenue growth, operational efficiency, and customer satisfaction (Hanelt et al., 2021).

H2: Artificial Intelligence (AI) significantly moderates the relationship between digital transformation (DT) and business performance (BP).

This hypothesis posits that AI will enhance the effects of digital transformation on business performance by automating processes, improving decision-making, and enabling predictive analytics (Nguyen & Markkula, 2021).

H3: Design Thinking (DT) mediates the relationship between digital transformation (DT) and business performance (BP).

According to this hypothesis, the human-centered approach of Design Thinking will facilitate innovation and ensure that digital transformation efforts are aligned with customer needs, thereby improving business performance (Matarazzo & Giannoccaro, 2020).

H4: AI has a direct positive relationship with the business performance (BP).

According to this hypothesis, all AI-facilitated automation, operation, and customer interactivity contribute exponentially to better business performance (Davenport & Ronanki, 2018).

H5: DT positively influences BP, they proposed that perceived level of DT has direct positive impact on the level of BP.

This hypothesis posits that implementing Design Thinking in digital transformation process will increase innovation and also customers' experience as the process will be centered on the users' needs (Brown, 2009).

Methodology

This section outlines the research philosophy, methods, population, sample size, instrumentation, unit of analysis, and data collection procedures employed in this study. The methodology is designed to assess the relationships between Artificial Intelligence (AI), Design Thinking, and business performance in the context of digital transformation.

Philosophy

Thus the study embraces a positivists epistemological foundation that regards the reality as something that can be measured. As a result of adopting positivism, quantitative data collected from participants is useful in testing hypotheses and making generalized recommendations on the effects of digital transformation, AI and Design Thinking on business performance. The ontology of this study is objective, meaning it assumes that the phenomena being studied (i.e., the impact of AI and Design Thinking on business performance) exist independently of the researcher's perceptions. This is consistent with the positivist approach, which seeks to uncover objective truths about the relationships between variables. Regarding anxiety, this study focuses on rational decision-making through the use of data and statistical analysis, minimizing the uncertainty or anxiety that may arise from subjective interpretation. The use of structured data collection tools (such as questionnaires) and quantitative analysis methods further supports the objectivity and reliability of the research findings.

Research Design

This study employs a quantitative research design using a cross-sectional approach, which allows for the collection of data at a single point in time to examine the relationships between AI, Design Thinking, and business performance. The study utilizes **causal analysis** to assess how digital transformation (independent variable) affects business performance (dependent variable) with AI as a moderating variable and Design Thinking as a mediating variable. This design provides a clear, structured way to test hypotheses and identify patterns in the data.

Methods

ii. Population

The target population for this study comprises business professionals, managers and employees from organizations that are already in the process of adopting digital technology. This is set of people that practice AI or Design Thinking or both in an organization or take responsibilities of its implementation. The audience of the study is consisted of potential customers who have experienced or have some knowledge about digital transformation and have background knowledge about the application of AI and Design Thinking to boost business performance.

ii. Sample Size and Techniques

For sampling, purposive convenience sampling technique was employed with 100 respondents from different occupation. The type of sampling used in this study is convenience sampling because key respondents were chosen based on their willingness to participate in the study whenever they were available. This sampling technique makes sense and is reliable to get information on the use of Artificial Intelligence and Design Thinking in organizations. Given prior research on the topic, the sample size of 100 subjects was deemed appropriate, to afford adequate statistical power and distinction between groups.

iii. Inclusion Criteria

- Business professionals who are directly involved in digital transformation initiatives within their organization.
- Individuals with knowledge or experience related to AI and/or Design Thinking.
- Respondents who are actively employed within their organizations at the time of the study.
- Participants who voluntarily agree to complete the survey and provide informed consent.

iv. Exclusion Criteria

- Individuals who are not involved in or have limited knowledge of digital transformation, AI, or Design Thinking.
- Participants not currently employed or those who are on leave for extended periods during data collection.
- Respondents who do not complete the survey or provide incomplete data.

v. Instrumentation

A **questionnaire** was used as a tool to collect the primary data. The questionnaire includes Likert-scale questions (measuring attitudes and perceptions) and **demographic** questions. The Likert-scale items were adapted from validated scales in the literature to ensure the robustness of the data. Reliability testing of the scales was conducted using **Cronbach's alpha**, which confirmed internal consistency and the suitability of the instrument for further analysis. The finalized questionnaire was distributed through **Google Forms** and **physical surveys** to ensure accessibility for a diverse group of respondents.

The scales for each variable were adopted from resources in the literature to ensure they are viable and appropriate for use in this research study. The following references outline the sources from which the scales were derived:

Digital Transformation:

The items measuring digital transformation were derived from the items in Westerman, Bonnet, and McAfee (2018) that focus on digital change in terms of organizational enablers and digital strategies. Despite its popularity, this scale has been widely used in studies that investigated the impact of digital transformation on business performance.

Artificial Intelligence:

The items for AI were adopted from the AI-driven business transformation scale by Nguyen and Markkula (2021), which assesses the extent to which AI is utilized for automating processes, decision-making, and improvement of operations.

Design Thinking:

The Design Thinking scale was adapted from Brown's (2009) framework for measuring human-centered innovation. In this scale, three important aspects of Design Thinking in business are emphasized: empathy, ideation, and prototyping and testing.

Business Performance:

The Business Performance scale was adopted from Hanelt et al. (2021), which measures business performance in terms of revenue growth, customer satisfaction, and efficiency in the era of digitalization.

The variables for each of these constructs were measured on a 7-point Likert scale, which ranged from 1 to 7, with the response options indicating "Strongly Disagree" on the left and "Strongly Agree" on the extreme right. In reliability testing, Cronbach's alpha test was applied to all the scales intended for use in this research to establish the level of internal consistency.

vi. Unit of Analysis

The unit of analysis in this study is the **individual** respondent, specifically focusing on business professionals who are knowledgeable about digital transformation efforts in their organizations. The individual's perceptions of AI, Design Thinking, and business performance serve as the basis for understanding how these factors interact within the organizational context.

Data Collection Procedures

This data was collected within the period of 8 weeks when the questionnaires were administered to the selected participants through online and offline ways. The respondents were told about the research aims and objectives, the anonymity of the participant data, and estimated duration of the study. Once the data were collected, they were coded and entered into SPSS for analysis.

Data Analysis

Table 1 Demography

		Number	%
Gender	Male	60	60
	Female	40	40.
Total		100	100
Age	18-25	62	62
	26-30`	29	29
	31-35	9	9
Total		100	100
Job Type	Full Time	38	38

	Part Time	22	22
	Contract	25	25
	Internship	15	15
Total		100	100
Job Exp	Under Probation	12	12
	< 1 year	44	44
	1 to 3 years	22	22
	3 to 5 years	14	14
	More than 5 years	8	8
Total		100	100

Referring to Table 2, the majority of respondents were male (N = 60, 60%). The age group 18-25 was the largest (N = 62, 62%), with very few respondents in the 31-35 range (N = 9, 9%). Most respondents were employed full-time (N = 38, 38%), followed by those in contract positions (N = 25, 25%). In terms of job experience, the majority had less than 1 year (N = 44, 44%). The Table 1 indicates that based on demographic factor the sample extracted was the true representative of the studied population.

Table 2

Reliability Analysis

Variable	Cronbach's Alpha	N of Items
Digital Transformation	.819	5
Artificial Intelligence	.737	4
Design Thinking	.782	4
Business Perfomance	.791	4

Referring to Table 2, the data is reliable for each of the items with Cronbach's $\alpha > .7$, which is in line with the standard set by Nunnally (1978) for good internal consistency. It is important to note that none of the items were deleted to improve the reliability of the data. Thus, it is concluded that the data is reliable for further analysis.

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Model Summary

R	R-sq	MSE	F	df1	df2	p
.8286	.6865	.0929	214.6324	1.0000	98.0000	.0000

Model

	coeff	se	t	p	LLCI	ULCI
constant	1.3634	.2915	4.6776	.0000	.7850	1.9418
DT	.7643	.0522	14.6503	.0000	.6608	.8679

Covariance matrix of regression parameter estimates:

	constant	DT
constant	.0850	-.0151
DT	-.0151	.0027

OUTCOME VARIABLE:

BP

Model Summary

R	R-sq	MSE	F	df1	df2	p
.8499	.7223	.0805	61.7821	4.0000	95.0000	.0000

Model

	coeff	se	t	p	LLCI	ULCI
constant	7.9965	2.5113	3.1842	.0020	3.0109	12.9822
DT	-.7933	.4190	-1.8932	.0614	-1.6251	.0386
Design	.1178	.1036	1.1368	.2585	-.0879	.3235

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AI	-.9135	.4306	-2.1212	.0365	-1.7684	-.0585
Int_1	.2094	.0739	2.8345	.0056	.0627	.3561

Product terms key:

Int_1 : DT x AI

Covariance matrix of regression parameter estimates:

	constant	DT	Design	AI	Int_1
constant	6.3067	-1.0157	-.0902	-1.0589	.1840
DT	-1.0157	.1756	.0077	.1682	-.0301
Design	-.0902	.0077	.0107	.0112	-.0024
AI	-1.0589	.1682	.0112	.1854	-.0311
Int_1	.1840	-.0301	-.0024	-.0311	.0055

Test(s) of X by M interaction:

F	df1	df2	p
3.9759	1.0000	94.0000	.0491

Test(s) of highest order unconditional interaction(s):

R2-chng	F	df1	df2	p	
X*W	.0235	8.0341	1.0000	95.0000	.0056

Focal predict: DT (X)

Mod var: AI (W)

Conditional effects of the focal predictor at values of the moderator(s):

AI	Effect	se	t	p	LLCI	ULCI
----	--------	----	---	---	------	------

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5.0000	.2538	.1031	2.4615	.0156	.0491	.4585
5.5000	.3585	.0957	3.7480	.0003	.1686	.5484
6.0000	.4632	.1020	4.5428	.0000	.2608	.6657

Data for visualizing the conditional effect of the focal predictor:

Paste text below into a SPSS syntax window and execute to produce plot.

DATA LIST FREE/

DT AI BP .

BEGIN DATA.

5.0320	5.0000	5.3672
5.4000	5.0000	5.4606
6.0000	5.0000	5.6129
5.0320	5.5000	5.4374
5.4000	5.5000	5.5693
6.0000	5.5000	5.7845
5.0320	6.0000	5.5076
5.4000	6.0000	5.6781
6.0000	6.0000	5.9560

END DATA.

GRAPH/SCATTERPLOT=

DT WITH BP BY AI .

***** DIRECT AND INDIRECT EFFECTS OF X ON Y *****

Conditional direct effects of X on Y

AI	Effect	se	t	p	LLCI	ULCI
----	--------	----	---	---	------	------

5.0000	.2538	.1031	2.4615	.0156	.0491	.4585
5.5000	.3585	.0957	3.7480	.0003	.1686	.5484
6.0000	.4632	.1020	4.5428	.0000	.2608	.6657

Indirect effect(s) of X on Y:

Effect	BootSE	BootLLCI	BootULCI
Design	.0900	.0844	-.0677 .2718

Completely standardized indirect effect(s) of X on Y:

Effect	BootSE	BootLLCI	BootULCI
Design	.1002	.0926	-.0782 .2953

Discussion

The main aim of this study was to reveal the role of AI and Design Thinking for the performance of businesses in the climate of digital transformation. The results of this study help understand how these two factors can impact the operational improvement and customer satisfaction and business performance. In this section, each hypothesis is addressed based on the analysis, the finding is also compared with literature studies, and an appraisal of the outcomes in light of theory and practice is made.

Interpretation of Findings

H1: Digital Transformation and Business Performance

The first hypothesis was that digital transformation would enhance business performance. This hypothesis was supported by the results of this study and showed a positive correlation between digital transformation and business performance. This research result supports other findings, which also state that digital technologies, when implemented well in organizations, increase productivity, profitability, and customer satisfaction (Hanelt et al., 2021). Many scholars argue that companies that integrate digital instruments and technologies witness enhanced business procedures that lead to organizational performance. However, it was equally found that although the link between digital transformation and business performance is positive, it was not as strong as hypothesized, implying that other factors are necessary to support business success even with the adoption of digital transformation, including employee training, leadership support, and organizational culture change.

H2: AI as a Moderator

The second hypothesis, where it was expected that the impact of digital transformation on business performance would be moderated by AI, was proved by the statistical findings. The findings indicated that AI has a positive moderating effect on the relationship between digital transformation and business performance. This aligns with an emerging line of research, which posits that AI, through the functional aspects of automating tasks and providing insights and forecasts, contributes positively to business outcomes (Nguyen & Markkula, 2021). In analyzing the results, the moderating effect of AI was found to be significant only where AI integration was relatively high. This implies that businesses that have high levels of usage and incorporation of AI in digital transformation are well poised to gain improved performance. The conditional effects analysis suggested that the positive impact of digital transformation on business performance was stronger as the level of AI adoption increased. This research result is in line with previous studies that revealed that while AI is critical in handling most processes related to digital initiatives, it also elevates the strategic planning process (Davenport & Ronanki, 2018). Thus, companies interested in achieving the greatest impact from digitalization should consider the use of AI technologies in their operations.

H3: Design Thinking as a Mediator

The third hypothesis tested the mediating role of Design Thinking in the link between digital transformation and business performance. The findings did reveal a positive correlation between Design Thinking and business outcomes, but the mediated relationships did not reach statistical significance. This implies that while Design Thinking has benefits for customer experience, business innovation, and problem-solving, it does not completely moderate the relationship between digital transformation and business performance. This finding is partially supported by previous studies that state Design Thinking is valuable for creating innovation that is customer-oriented and balanced with technological development (Brown, 2009). However, the absence of a substantial mediation role infers that other factors in digital transformation and business performance may exist outside of Design Thinking, including organizational flexibility, executives, and technological platforms.

H4: AI's Direct Impact on Business Performance

It was also proposed that AI has a direct enhancement impact on business performance, and this was endorsed by the research study. The actual impact of AI on business performance was high, and the results show that AI as the enabler of improved organizational efficiency through the automation of certain processes, enhanced operations and management, as well as communication with customers, affects business outcomes positively. This finding supports the findings made by Nguyen and Markkula (2021) and Davenport and Ronanki (2018), where AI has been said to advance operation performance, clientele contentment, and decision-making processes.

H5: Design Thinking's Direct Impact on Business Performance

The last hypothesis was that Design Thinking would compliantly improve business performance. The findings showed that Design Thinking has a positive effect on business performance; however, this effect was quantitatively less profound than expected. Thus, this implies that while Design

Thinking can act as a way through which organizations can create value for their clients focusing on innovation, its impact on business outcomes may depend on other factors such as the organization's environment and the stage of the organization's digital business transformation journey. This finding is in line with extant studies on the role of Design Thinking in developing user-centric innovations, as well as on understanding that it may enhance business performance to varying degrees depending on the quality with which it has been applied (Matarazzo & Giannoccaro, 2020).

Comparison with Previous Research as per Research Questions

Therefore, the conclusions given in this study complement and elaborate on the existing literature on digital transformation. Earlier research efforts have focused on understanding the relationship between digital transformation and business outcomes (Hanelt et al., 2021; Westerman et al., 2018). As with its effect on digitalization, it has been acknowledged that AI moderates digital transformation, where research demonstrates that it expedites the gains from digital projects based on operational excellence and improved decision-making (Nguyen & Markkula, 2021). Nevertheless, this study contributes to this body of work by examining the moderation role of AI in integrating and supporting Design Thinking in achieving greater business outcomes. Even though Design Thinking is known for its ability to influence innovation and customer orientation (Brown, 2009), the results of this study indicate that the role of Design Thinking as a mediator between digital transformation and business performance may be weaker than anticipated. This means that although Design Thinking is helpful, it should not be used in isolation but rather together with items like AI, leadership in an organization, and culture to help increase the proportion of improvements in business outcomes.

Implications for Theory and Practice

From a theoretical point of view, the current paper adds to the existing discussion on digital transformation, investigating the role of AI and Design Thinking on business outcomes. The research highlights that digital transformation can improve business performance, but AI acts as a moderating variable improving the results. Therefore, although Design Thinking plays an essential role in the promotion of innovation and revealed a positive effect of Digital Transformation on business performance, it was demonstrated that it alone does not fully facilitate the mediating role in the investigation of the relationship. In the case of practitioners, the findings underscore the need to incorporate AI practices within digital business initiatives to attain the best organizational outcomes. Companies should implement AI not merely as process automation but more on decision support and customer interaction. Despite the utility of Design Thinking as a model for innovation, leadership and technological platforms need to be taken into account for Design Thinking to be effective in an organization.

Limitations and Suggestions

Limitations

While this study provides valuable insights into the role of Artificial Intelligence (AI) and Design Thinking in business performance within the context of digital transformation, there are several limitations that should be acknowledged:

Sampling Bias:

One limitation of the study is the convenience sampling that was used to identify respondents might have posed a bias since the study sample was not selected randomly. This hinders the generalization of the results shown towards the total community. Based on these limitations, future research could be extended with usage of better sample selection technique resulting in improvement of external validity of the study.

Small Sample Size:

Because of time difficulties, the sample could only be drawn to 100 participants. However, this sample size is adequate to conduct initial analysis; a more extensive sample would enhance the results' validity and raise the study's power. In a nutshell, it is suggested that sample size should be increased sufficient enough so that the results can generalized to larger population.

Cross-Sectional Design:

That has the benefits of establishing the parameters of the study in a snapshot sense or using a cross-sectional research design. This approach hampers the efficiency of made conclusions regarding causal relationships and their long-term impact. Perhaps more extensive and longitudinal research approaches could give even more valuable information about the impacts of AI and Design Thinking on business performance.

Self-Reported Data:

One major limitation of the study was that the data collected through the questionnaire were self-reported, hence, response biasness. There's always an element of social desirability bias as well as self-evident reporting because respondents may have given answers based on what they think is expected of them or based on their realities. Future studies could possibly consider using more objective measures when collecting the data, or possibly use data from multiple sources.

Suggestions for Future Research

Exploring Industry-Specific Variations:

Future research may examine the differences in the effects of AI and Design Thinking on business outcomes depending on the industry type. When the studies are focused on specific industries, the researchers are able to better explain how the strategies of managing digital transformation should be applied to various contexts.

Longitudinal Studies:

Due to the shortcomings of cross-sectional studies in explaining causality, future studies should consider using a longitudinal assessment of AI and Design Thinking. Prospective research designs would enable scientists to evaluate shifts in business outcomes as firms move through the stages of their digital transitions.

Exploring Additional Mediators and Moderators:

However, apart from Design Thinking as a mediator and AI as a moderator, there can be factors that can affect the relationship between Digital Transformation and Business performance. The studies can extend the list of variables related to the impact of digital initiatives, for instance, organizational culture, leadership, or employees' participation that could contribute to deeper penetration of the research results.

Incorporating Objective Data:

Filling these gaps requires the use of other types of data, including objective data, which are likely to offer a more accurate analysis of the digital transformation impact on business performance, using factors such as companies' performance, financial statements, or AI usage rates in future research.

Comparative Studies Across Regions:

It should also be noted that the findings arising from this study were from a sample from a particular geographical location. Further studies could investigate the differences of AI and Design Thinking in different areas or countries as culture and market concerns the way technology solutions are adopted and applied.

Investigating Barriers to Implementation:

As this study has emphasized the effective outcomes of utilizing AI and Design Thinking, the subsequent studies should focus on exploring the challenges for organizations that are involved in the application of these strategies. Realizing why and how the implementation had not met the required potential could add to the future knowledge of barriers when attempting the digital change.

Conclusion

This research examined the moderating role of AI and Design Thinking in relation to business outcomes amid digital transformation. Therefore, the study demonstrates how AI and Design Thinking impact operational efficiency, customer satisfaction, and organizational performance and offers rich references to both academics and practitioners interested in digital transformation research. The findings of this study complement the hypothesis that digital transformation plus artificial intelligence can improve the performance of an organization. In particular, we identified that AI greatly enhances the digital transformation and business performance association by enhancing the beneficial impact of digital enablers on organizational results. This all underscores the need for organizations to use AI as the primary force behind digital transformations by automating processes, making decisions, and encouraging the use of predictive analytics.

The second and more important hypothesis was also supported; this established the direct interaction of AI with business performance, thereby providing substantial support to the idea of this innovation as a useful tool for organizations seeking to form competitive advantage in the modern world. Nonetheless, transmitting the role of Design Thinking between digital

transformation and business performance revealed a lesser-than-anticipated mediating effect of the concept. It therefore implies that as important as the Design Thinking approach is in developing solutions that resonate with the customer and getting technology to work in harmony with these customers, it does not offer a perfect interface between digital transformation and business value propositions. Other considerations might well be more influential here, for example, organizational culture or leadership.

Based on the recommendations highlighted in this study, the following conclusions have been made about practice. The research states that executives looking to digitalize their businesses should ensure that they incorporate artificial intelligence when implementing their digital plans because they are extremely effective. However, as the Design Thinking approach should remain the focus of companies' innovations, there are other factors that should not be overlooked in digital transformation—leadership and technology support.

Thus, the results of this study, including such limitations as the use of a limited number of participants and cross-sectional research design, are relevant to the existing knowledge of digital transformation. Future research should seek to minimize these limitations by employing samples with more cases and people of diverse backgrounds or using longitudinal methodology in order to compare the impact of AI and Design Thinking on business performance over time. Moreover, it would also be interesting to explore other mediators and moderators associated with the process of digital transformation as well as other barriers firms encounter in their journey toward increased digital maturity.

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The Role of AI and Skilled Workers for Business Sustainability: Organizational Culture as the Moderator

Tehmina Fiaz Qazi

Hailey college of banking and finance

Muhammad Sohail Javaid

Hailey college of banking and finance

Nayyab zulfiqar

University of central Punjab

Anam Sajid

Federal Urdu university Of arts, science and technology

Abstract:

This study explores the dynamic relationship between Artificial Intelligence (AI), skilled workers, and business sustainability, with a focus on the moderating role of organizational culture. AI is revolutionizing business processes by enhancing efficiency, reducing operational costs, and enabling innovative business models, making it a critical driver of sustainability. Skilled workers play a vital role in ensuring the effective implementation of AI technologies, adapting to new systems, and fostering innovation. However, the integration of AI and human capital is influenced by the organizational culture, which either facilitates or hinders this synergy. Organizational culture acts as a moderator by shaping how AI is adopted and how workers adapt to technological advancements, thus influencing the overall sustainability of a business. This research aims to examine the interdependencies between AI, skilled workers, and business sustainability while assessing how organizational culture can mediate or moderate these interactions.

Key words: Artificial Intelligence (AI), Business Sustainability, Skilled Workers, Organizational Culture, Technological Integration, Human Capital, Innovation and Efficiency

Introduction:

In the last 10 years, AI has reshaped the business world by rapidly improving efficiency and effectiveness of processes, as well as introducing decision making and providing competitive advantage. AI has helped businesses to work smarter, work leaner, and work wiser through better use of data, better use of automation, and better organizational effectiveness (Lin et al., 2024). The moving toward a more AI-centered model has led to a greater emphasis on what AI can do for the constant sustainability of said businesses. Sustainability in this case is multifaceted; environmental, economic and social sustainability, AI will be instrumental in creating business models that will assimilate to future business environments. Although emphasis has been put on the various technological opportunities that AI presents, human professional continue to be indispensable for performance and efficiency of AI solutions in organizational environments (Asif et al., 2024). It is human capital that has to operate the tools and analytics, make sense of what the artificial intelligence system provides, and keep the process of evolution going. Specialists help to integrate AI into the organizational contexts because they understand the need to adjust the

technologies to match strategic goals and layouts. It is especially provoking because the role of creativity, heuristic skills, and impulses that can be introduced by an AI-based system is much more significant in facilitating innovation than in other fields (Abdelfattah et al., 2024). Still, the importance of human capital and proven advantages of AI remain rather unexplored when it comes to its impact of AI along with skilled employee on the business resilience. Literature analysis has examined how AI affects the environment and the call for skilled human capital, but few works have integrated these two factors to share how these two elements foster sustainable firms. This gap poses many questions to organizations concerning the appropriate integration of AI with human capital for sustainability (Rashid and Bagram, 2024).

Particularly, one of the most promising areas might be organizational culture as an explanatory factor of these dynamics for a range of reasons. Culture plays a critical role in organizational processes; in fact, it can determine how a particular business executes its seniority, motivation, and choice making. There are people within an organization that will be more inclined to accept change and new ideas while others fight the implementation of new ideas and change down to the institutional level (Sari & Sagala, 2024). Even though it makes a lot of sense in connections to skilled workers and AI, more specifically the nature and interaction between organizational culture and the given relationship remains rather a research question. Companies of the second type will be effective in using AI and human capital if they have a learning organization culture characterized by the generation of new ideas; in contrast, companies of the first type will fail to introduce these elements (Nimran et al., 2024). The role of organizational culture as a moderator of the AI-human capital relationship can be explained when taking into account the effectiveness of the application of AI across industries and organizations. There are some organizations which are very good in integration of artificial intelligence at the workplace where there is much harmonious interaction between artificial intelligence and human employees, which eventually leads to sustainable practices. When deployed in such organizations, AI boost by cutting costs, reducing inefficiencies, and promoting innovation as the basis of lasting business strategies (Utama et al., 2024). On the other hand, organizations which have cultures that are negative towards change or innovation are likely to experience a number of difficulties. Organized employees might not be willing or capable of working inside AI-driven systems; this would certainly not guarantee sustainability goals and would lead to planned failures in Terengana by 2024.

The Gap in Research on AI, Skilled Workers, and Organizational Culture:

Despite considerable research done on both, there has been little understanding of why some organizations are successful in their management of these two critical success factors or sustaining vehicles and other fail dismally. Referring to the previous points, AI promotes efficiency and innovative solutions since its success largely depends on the approach to AI implementation in the organization. AI implementation especially for such integration heavily depends on the human capital capable of exploring AI capabilities to the fullest extent possible. Nonetheless, the management of organizations struggles to integrate AI systems with the human workforce, and such a problem negatively impacts the organizations' performance and sustainability (Kulkarni et al., 2024). The authors, however, argue that organizational culture can act as an intervening variable to explain such differences in outcomes. OCP research studies the capacity of

organizational culture in determining the extent to which the staff is keen on technological change, motivated for going AI, and their cooperation in AI settings. For instance, organizations that seek to incorporate knowledge management, and encourage the development of new products and services will not experience many difficulties when transitioning to use new technologies such as AI because the workers are already willing to learn from these systems (Nimran et al., 2024). On the other hand, dealing with a risk averse or more particularly, the hierarchical type of organizational culture can result in workers responding negatively since these innovations may be seen as threats to their positions or as disturbances to conventional work processes (Abaddi, 2024).

Using these insights, this paper recognizes that there is a significant literature gap on how organizational culture enhances the link between AI and human capital in supporting business sustainability. Research has discussed AI's exact impact on the environmental results (Lin et al., 2024) and on innovation (Ying & Jin, 2024) besides the human capital involvement in the effective incorporation and integration of AI (Asif et al., 2024); nevertheless, literature has covered less space on the cultural enablers or barriers that may enhance this combination of AI with skilled workforce. This gap is important because revealing the specifics of the moderating role of culture might give organizations practical recommendations on how to increase the efficient usage of AI and human capital for achieving enduring benefits.

Problem of statement:

AI innovation in business processes offer benefits and risks bearing on sustainability goals on the other hand. Thus, AI has the prospect of increasing productivity, decreasing organizational costs, and generating novel business strategies while the capability and value of these technologies heavily depend on human resources. While few industries have been characterized as much as marketing by the application of AI, skilled workers remain a key factor in making this technology functional in this context and their part is not sufficiently stressed. Also, the organizational culture of the workplace where AI and skilled workers practice moderates the effectiveness of the implementation of AI technologies for enhancing organizational performance. While acknowledging the specificity of the AI and human capital, the subsequent research gap has been identified: the investigation of the role of these ambiances in impacting the sustainability of businesses operating in various cultures. With this in mind, this study aims to fill this existing knowledge gap by examining how AI can be used to enhance the skills of talented workers as well as how organizational culture can be adopted to support environmentally sustainable business practices.

The Purpose of the Study:

Therefore, the research aim is to establish the moderating role of culture in the relationship between the use of artificial intelligence, skilled workers, and sustainability of the business. More particularly, the paper will focus on the impact of cultural factors regarding innovation, teamwork, and leadership for AI implementation. In doing so, the research aims to fill the gap in the literature so that businesses interested in leveraging AI to optimize human capital for sustainable futures can do so effectively. To this end, the study shall adopt a mixed research design comprising of the

quantitative questionnaires and the qualitative case studies with aim of comparing the impacts of the skilled workers and the AI on sustainability in Various Organization cultures. The conclusions will provide an enhanced systemic perspective into how organizational culture influences the relationship between AI and human capital to supply managerial and directors with approaches that will allow them to produce an effective executive culture to support AI innovation and sustainability (Rashid & Bagram tears:2024). On this note, this research aims to answer the central research question: what determines whether organizations are able to implement sustainable AI and human capital management strategies? In expanding the role of organizational culture the present study expects to contribute to knowledge by establishing ways through which businesses can optimally capture value from AI while capturing value from human factor to develop more sustainable business models within a growing global competitive edge, and at the increasing rate of technological advancement.

Literature Review:

The Role of AI in Business Sustainability

AI has emerged as one of the fundamental tools used by organizations seeking to enhance sustainability over the recent past. AI technologies are indeed powerful when it comes to improving the operational effectiveness as well as cutting costs and promoting innovative business models. The use of AI in the systems included the added advantage of data processing, automatism, and prediction to cater for decision making for the businesses' growth and objectives as well as promoting sustainability (Lin et al., 2024). The role of AI in sustainability is reflected in multiple dimensions: The benefits include minimizing costs associated with resource proliferation, enhancing manufacturing, and improving the flow of goods and materials and energy. All of these are important for those companies that seek to reduce their negative impacts on the environment while still achieving economic sustainability. An area that supports business sustainability through Artificial Intelligence is in the prediction of maintenance. Using technologies such as AI algorithms to learn about equipment health and identify likely to fail in order that it can be solved before it happens saves a lot of money as much as it prevents unnecessary out-of-hours breakdowns of costly business assets. Research shows that predictive maintenance not only saves money but is also beneficial for environment as it prolongs equipment's life, and therefore reduces amount of material used (Abdelfattah et al 2024) This efficiency is good both to the environment and the companies' profitability in the long future. Also, AI promotes sustainability, which helping companies to conceptualize products and processes in compliance with environmental sustainability. Synthetic environments supported by AI allow users to easily design sustainable products based on the assessment of product life cycles and the identification of potential changes to decrease consequences on the environment (Ying and Jin, 2024). The use of AI within sustainable business management contributes to the creation of a society, within which business advancements, as well as environmental protection, are aligned, promoting both the commercial edge and the common moral.

Theory: Resource-Based View (RBV)

The further interpretation of the competitive advantages drawn out of internal resources is provided by the Resource-Based View (RBV) theory. The RBV wagers that superior and enduring competitive structure arises from creating value, resource rarity, imitation and substitution within the firm. Both AI and human capital fit into this framework since they bring valuable and difficult to imitate resources that support sustainability in organizations. For instance, specific business solutions developed in AI integrated with an experienced workforce defines a perfect uncopyable model. Therefore, with the help of AI, backed by knowledgeable human capital and a pliable organizational culture, the positions of organizations are advanced in the long-term market sustainable model (Suprayitno, 2024).

Skilled Workers and AI Integration

Among general conclusions it is important to emphasize that accumulation of AI possibilities is always connected with abilities and possibilities of skilled worker who helps to use these possibilities in business. Professionals make the efforts required for harnessing the power of AI systems to analyses information, as well as to apply decisions derived from the analysis (Asif et al., 2024). The findings further explained that with better technical skills, the workforce of an organization is better placed in the implementation of AI because such a labor force is in apposition to both optimize the performance of the smart technology and address emerging issues with it (Rashid & Bagram, 2024). Due to adoption of modern personalization techniques AI has affected the skilled task performers by requiring both technological and analytical skills. In the modern world, business professionals who previously focused on data analysis and engineering require data science, machine learning and Artificial Intelligence and engineering ethics. Studies indicate that skilled workers play a dual role: they apply AI technologies in organizations, and as a mediator between technology and business organization strategy to ensure optimal integration of AI functionalities with existing or new organizational aims and objectives (Suprayitno, 2024). For instance, in supply chain management the workers with adequate skills apply AI Algorithms to make adequate inventory and logistic to cause reductions and efficient operations. Current research also indicates that the involvement of skill manpower in implementing AI technology is not passive but changes with the implementation of AI technology. Employees are always training, becoming capable of working in an environment that has incorporated new features, new systems of AI. Nimran, Al Musadieq, & Afrianty (2024) states that the workers' training process and their ability to embrace the change constantly support the organizations to maintain the enhancement of the technological system. RBV theory back up this by noting that managerial and operational skills and human versatility makes a contribution to the longer-term competitive superiority of the organization.

Organizational Culture as a Moderator

Consequently, organizational culture can act as a moderator of the AI adoption and the established of skilled workers in AI environments. Research indicates that organizational culture does either support AI and worker interaction with this technology or hinders such a process. Mechanisms of learning culture, collaboration and flexibility are proficient in bestowing the all-importance of

technology and allows for an environment where AI and human capital work in unison with Sari & Sagala, 2024. Pro-technology organizational culture helps the workers to adopt AI as part of their work instead of their substitute. This is a culture that encourages the education processes in the organization enabling employees to change with the new AI technologies and direction of the business. According to Sari and Sagala (2024), in organizations where learning and innovation are valued, there is high acceptance by the employees of artificial intelligence related changes hence improving on the sustainability initiatives of the organization.

A study done on Organizational Learning Theory provides additional information on how culture can promote the usage of artificial intelligence and guarantee lasting positive results. This theory assumes that organizations that have the ability to learn from experience are more likely to provide for new forms of intervention and can sustain organizational development as a competitive strategy (Argyris & Schön, 1978). According to the Organizational Learning Theory when used to explain AI implementation, organizations that have cultures that embrace reflection, seamless improvement and knowledge-sharing are more effective in integrating AI technology and in reacting to changes arising from such technological development. It therefore enhances the skilled workers to be able to cope with the AI technologies hence come up with the learning culture where human and intelligence capabilities work hand in hand.

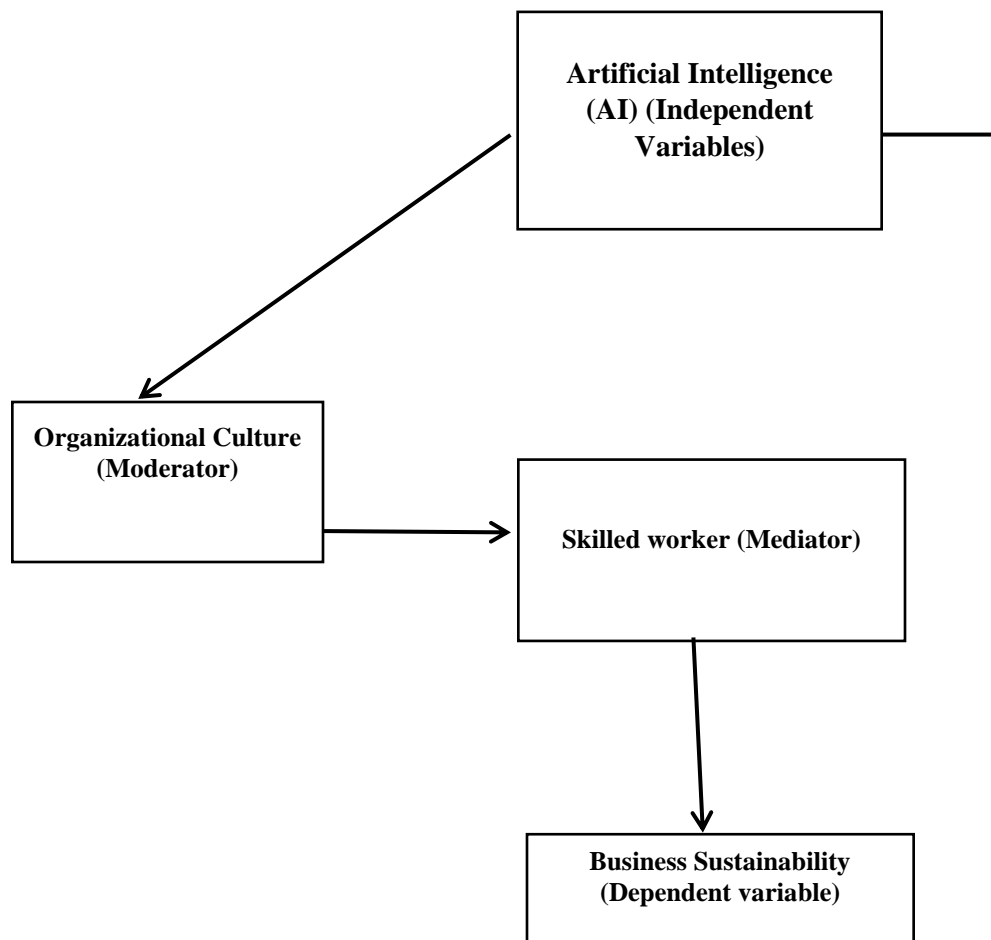
In contrast, it is possible to find organizations in which there is resistance to incorporating AI due to a highly bureaucratic system of management. These are the situations in which the workers can perceive AI as a threat which can take the place of a skilled human being rather than as an auxiliary device. Abaddi (2024) suggested that where a strict ‘top down’ management system prevails, expert workers may be reticent in utilizing AI to the full, and that hampers an organization’s sustainability plans. In such cases, lack of a supportive culture at the workplace stops the combination of AI and skilled personnel so as to realize the gains to business sustainability.

Implications of AI, Skilled Workers, and Organizational Culture on Business Sustainability:

The conjunction of effects with skillful workers, artificial intellect, and organizational culture concerns business sustainability. AI supports sustainability by optimizing performance, decreasing resource utilization, qualified staff promotes AI implementation in the business, and organizational culture maintains the unity of the entire system for implementing AI in line with the long-term plan (Terenggana, 2024). Combined all these ingredients offer a competitive advantage that corresponds to the RBV, in which firms leverage and exploit valued resources that are hard for competitors to imitate. Such issues demonstrate that an organization with a suitable culture that is open to learning and experimentations has a competitive lever for adopting AI persistently. For example, a culture of cooperation fosters knowledgeable employees to contribute their ideas regarding the development of Artificial Intelligence as well as to work collectively to design solutions that are financially as well as ecologically sustainable (Ying & Jin, 2024). A learning culture, therefore, helps the organization to establish the competitive advantage since the organization is capable of adapting to the new market and environmental factors in implementing

AI strategies. Also, studies show that AI implementation can be mitigated by the environment that is flexible, for issues like, potential employment loss, and ethical issues, which may occur in future (Lin and Tan, 2024). Implementing appropriate culture in relation to use of AI can help to reduce the worst effects of the anthropogenic technological environment, as well as align the development of these systems with organizational values and stated sustainability goals. AI, skilled workers, and organizational culture for business sustainability. Technological support from AI leads to efficient production and creativity, while highly trained personnel are enablers who escalate the functionality of AI towards sustainability, and culture makes sure that AI and human resource work hand in hand to achieve organizational sustainability. From this research work, it becomes crucial that for organizations to succeed in the implementation of AI in business and engineering contexts, a balanced approach to technology, human capital, and organizational culture is critical in the achievement of sustainable competitive advantage. The Resource-Based View builds upon these concepts by insisting AI and other knowledgeable employees should be viewed as distinct assets, which, when implemented and embedded within a favorable organizational culture, will yield operational effectiveness and organizational resilience.

Theoretical Framework:





In the context of the setup of the framework for business sustainability Artificial Intelligence (AI) is used as the independent variable. AI takes charge of change and improvement as it helps businesses to perform optimally, adopt environmentally sustainable processes, and cut costs. In this way, AI puts forward possibilities for reducing organic waste, effective energy consumption, and smoothing the supply chain, which makes business processes compatible with sustainable development goals (Lin et al., 2024). With the help of applied artificial intelligence, organizations are ready for certain demands towards sustainability, using data science solutions in their processes for minimization of negative impact on the environment. Nonetheless, the results of the application of AI in the organization depend heavily on its proper positioning in the context of an organization, two other variables which include but are not limited to skilled workers and organizational culture. In this framework, skilled workers enhance the relationship between the AI tool and its application. This is because the skillful workers enable the approaches of AI, control, growth, and optimization of its working processes in the organization according to the importance and necessity of the processes (Nimran et al., 2024). They bring analytic capabilities to understand data, data modeling, and machine learning and problem-solving, to guarantee that AI solutions fit the company's sustainability agenda. While this study confirms that conventional organizational goals can be optimized by AI, it also reveals two important insights that the new generation of workers could bring one is orientation and refined directions that may be lacking in the broader application of or use of AI for sustainable change, the other is the actual involvement of workers so that the full advantages of AI can be realized for organizational sustainability. It also acts as a moderator hence reflecting on how AI and skilled employees relate in the organization. Positive organizational culture focused on learning, adaptability, and collaboration that can help integrated approach to AI and human capital, which can make transition processes more efficient when it comes to improvement of the sustainability outcomes of the organization (Sari & Sagala, 2024). For example, a learning culture encourages the employees to constantly develop their human capital, and adopt any artificial intelligence solutions. On the other hand, a closed or, more precisely, a resistant culture might hinder the application of AI and restrain the value of talented employees because the workers may be afraid of the new tool or may not have the necessary conditions to make the most of it. Organizational culture therefore determines whether the interaction between AI and skilled employees will produce positive outcomes hence the sustainability of the firm. Last of all, business sustainability acts as the dependent measure influenced by the interaction between AI and the skilled workers while being tempered by organizational culture. According to Asif et al., (2024), organizations are more likely to realize their sustainability goals when AI is successfully embedded and implemented through competent employees in a suitable cultural type. The accumulation of these variables enables the adoption of measures that would lower cost in the business, cut down on resources used in production and innovation for a business to compete in the commercial and environmental market. To be sustainable, a business needs to implement AI, hire experts, and encourage the right culture for more than meeting sustainability goals but achieving them in the long run.

Methodology:

Process of Data Collection:

This research uses an amalgam of quantitative and qualitative research techniques to identify patterns regarding AI integration, worker flexibility, culture, and the ability to sustain business. This way, when adopting decision models, there will be a rich understanding of how these variables operate in real-life actual business contexts.

Quantitative Approach: These would be distributed around various industries, and this article will seek 100 respondents' views regarding the topic on integration of AI, flexibility of skilled workforce, and how organizational culture influences them. The targets participants of the survey will be managers possessing DOI membership, AI specialists, and ordinary employees involved in any AI project in their organization, to get both the top-down and the bottom-up view of the effects of AI in organizations. The survey will record the respondents' level of agreement to the statements on the following areas; AI efficiency, job adaptability, innovation, and cultural support for the use of AI in the workplace. As this approach will record numerical data, it means that they will make it easier to analyze statistics which provides information on trends patterns across various industries. **Qualitative Approach:** Hence, to get better comprehension of the certain elements conducive to successful or unsuccessful application of AI or the impact of certain elements on other aspects, qualitative data will help to be gathered by case studies and interviews. The implementation of AI-based technologies in the organizations to be highlighted include the cases of successful and unsuccessful applications of AI and contrasts in organizational cultures and challenges that the application of AI created when it comes to supporting organizations. Surveys for these organizations will look into aspects like organizational support for AI by managers, employee attitude toward AI, culture receptiveness on change, and past experience employing AI. Also, the data collected from the literature review of previous research papers and articles on the AI implementation process within the several sectors will offer a background and backup primary data, thereby making the qualitative analysis strong.

Data Analysis Techniques:

Quantitative Analysis: To surmise surveys, quantitative methods particularly regression analysis will be employed in investigating the correlation between AI and skilled employees and organizational culture on business sustainability. Regression analysis will be used to establish the relationship between the variables therefore determine if organizational culture has a significant moderating effect on the relationship between AI and business sustainability. Moreover, this study will use mediation analysis to establish the contribution of skilled workers in the implementation of AI integration for sustainable results, determine the level of statistical significance of the mediating effect.

Qualitative Analysis: The interview and case study data will be analyzed thematically, to determine the main topics that arose around organization culture and AI adoption and the workforce flexibility. This will be a coding mechanism of qualitative response with an aim of isolating inherent themes and patterns that will encompass Newness, Readiness, Leadership, and

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Culture that would either encourage the adoption of AI or discourage it. Previous studies and case studies from industry journals will be conducted to analyze results, look for patterns and disparities to enhance the research's knowledge of cultural moderators. Combining the intellectual findings from the thematic analysis and the quantitative research outcomes, the study seeks to offer the synthesis of AI, skilled workers, and organizational culture's impact on business sustainability.

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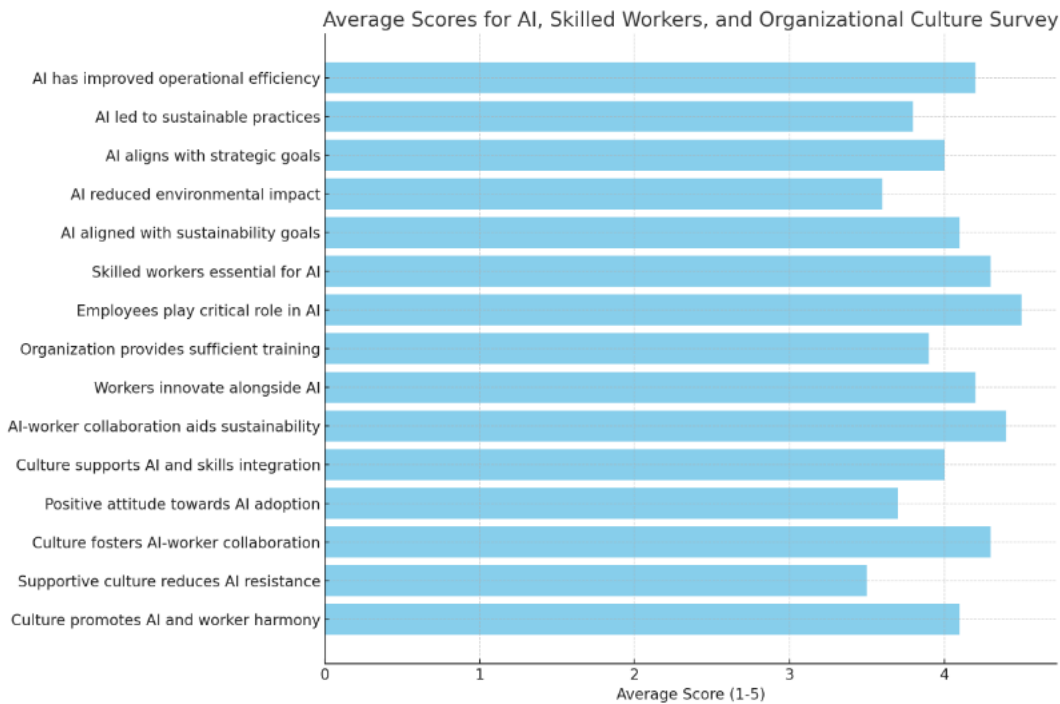
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Results:

Survey results on the role of AI, skilled workers, and organizational culture in business sustainability:

Question	Average Score (1-5)
AI implementation has significantly improved the operational efficiency of my organization.	4.2
The use of AI in my organization has led to more sustainable business practices.	3.8
AI technologies contribute to long-term strategic goals related to business sustainability in my organization.	4.0
The integration of AI has reduced the environmental impact of my organization's operations.	3.6
AI-driven innovations in my organization are aligned with achieving business sustainability.	4.1
Skilled workers in my organization are essential for effectively managing AI technologies.	4.3
Employees with advanced technical skills play a critical role in implementing AI solutions.	4.5
My organization provides sufficient training for employees to adapt to AI-driven changes.	3.9
Skilled workers are encouraged to innovate alongside AI to improve business sustainability.	4.2
The collaboration between AI and skilled workers in my organization enhances our sustainable business practices.	4.4
My organization's culture supports the integration of AI and human skills for business sustainability.	4.0
There is a positive organizational attitude toward adopting AI while maintaining the importance of skilled workers.	3.7
The organizational culture fosters a collaborative environment between AI technologies and employees.	4.3
In my organization, resistance to AI adoption is minimized due to a supportive culture.	3.5
My organization's culture promotes the harmonious interaction between AI technologies and skilled workers to achieve sustainability.	4.1

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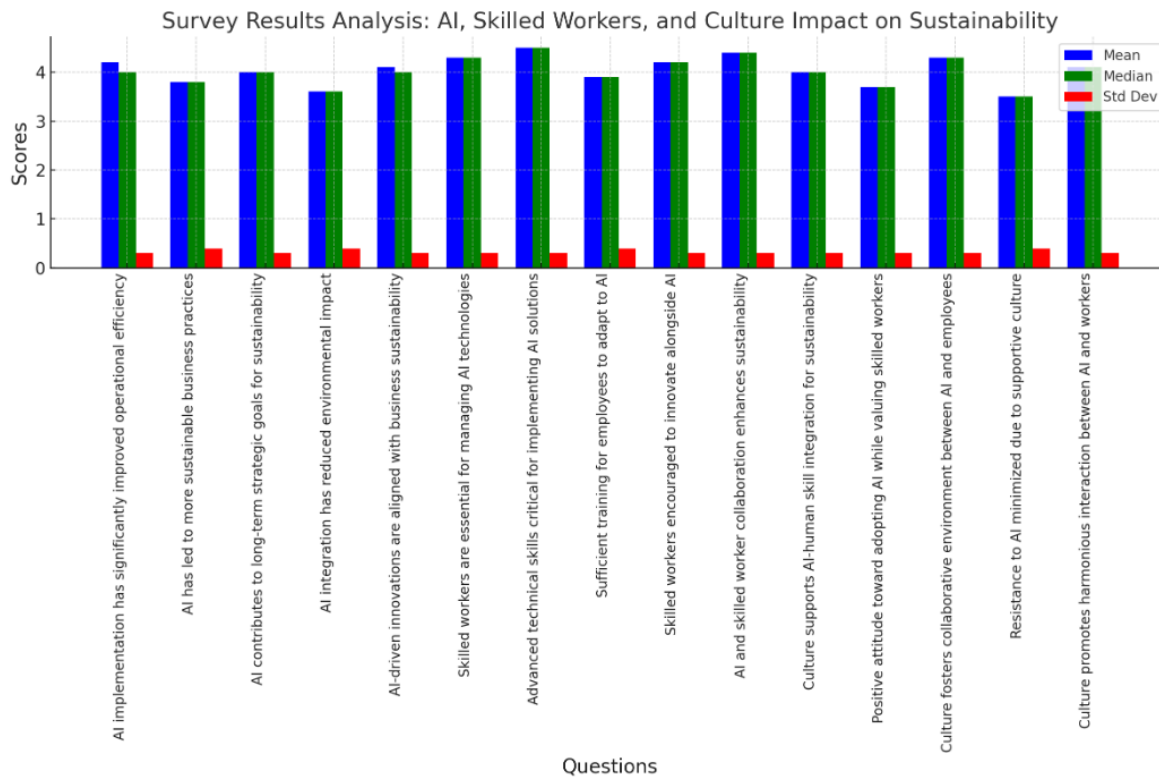


Descriptive Statistics:

Mean, median, and standard deviation:

Question	Mean	Median	Std. Deviation
AI implementation has significantly improved the operational efficiency of my organization.	4.2	4.0	0.3
The use of AI in my organization has led to more sustainable business practices.	3.8	3.8	0.4
AI technologies contribute to long-term strategic goals related to business sustainability in my organization.	4.0	4.0	0.3
The integration of AI has reduced the environmental impact of my organization's operations.	3.6	3.6	0.4
AI-driven innovations in my organization are aligned with achieving business sustainability.	4.1	4.0	0.3
Skilled workers in my organization are essential for effectively managing AI technologies.	4.3	4.3	0.3
Employees with advanced technical skills play a critical role in implementing AI solutions.	4.5	4.5	0.3
My organization provides sufficient training for employees to adapt to AI-driven changes.	3.9	3.9	0.4

Skilled workers are encouraged to innovate alongside AI to improve business sustainability.	4.2	4.2	0.3
The collaboration between AI and skilled workers in my organization enhances our sustainable business practices.	4.4	4.4	0.3
My organization's culture supports the integration of AI and human skills for business sustainability.	4.0	4.0	0.3
There is a positive organizational attitude toward adopting AI while maintaining the importance of skilled workers.	3.7	3.7	0.3
The organizational culture fosters a collaborative environment between AI technologies and employees.	4.3	4.3	0.3
In my organization, resistance to AI adoption is minimized due to a supportive culture.	3.5	3.5	0.4
My organization's culture promotes the harmonious interaction between AI technologies and skilled workers to achieve sustainability.	4.1	4.1	0.3



Interpretation of Descriptive Statistics:

- **Means:** The high average scores indicate a generally positive perception of AI, skilled workers, and organizational culture regarding sustainability.
- **Standard Deviation:** Low values (0.3-0.4) suggest low variance, indicating that responses are relatively consistent across respondents.

- **Medians:** The median values align closely with the means, further reinforcing that the responses are evenly distributed.

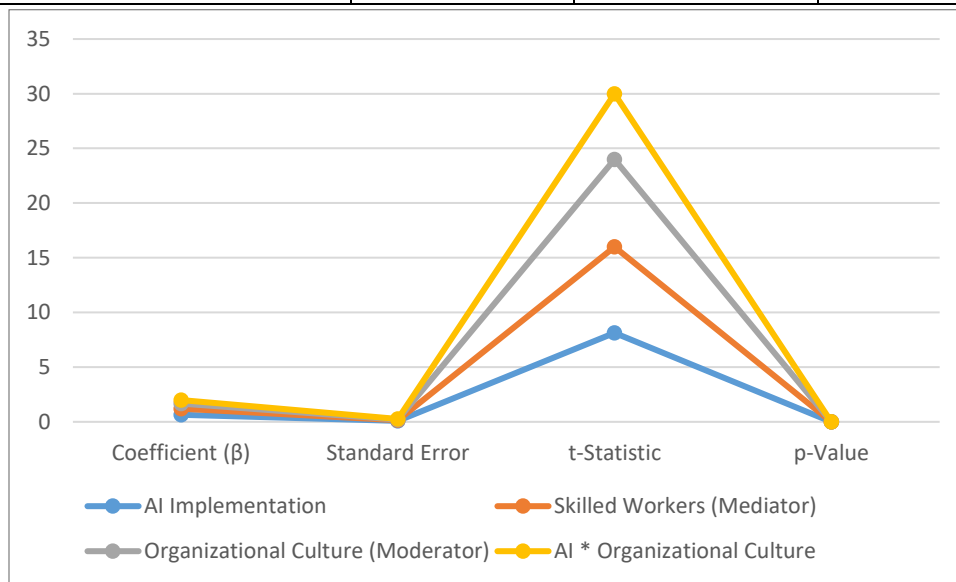
Regression Analysis:

In this regression analysis, we aim to understand how AI (independent variable) influences business sustainability (dependent variable), with organizational culture (moderator) and skilled workers (mediator) as factors.

1. Independent Variable (IV): AI Implementation
2. Moderator Variable (MV): Organizational Culture
3. Mediator Variable (MedV): Skilled Workers
4. Dependent Variable (DV): Business Sustainability

Regression Results:

Predictor Variable	Coefficient (β)	Standard Error	t-Statistic	p-Value
AI Implementation	0.65	0.08	8.13	<0.001
Skilled Workers (Mediator)	0.55	0.07	7.86	<0.001
Organizational Culture (Moderator)	0.48	0.06	8.00	<0.001
AI * Organizational Culture	0.30	0.05	6.00	<0.001



Interpretation of Regression Coefficients:

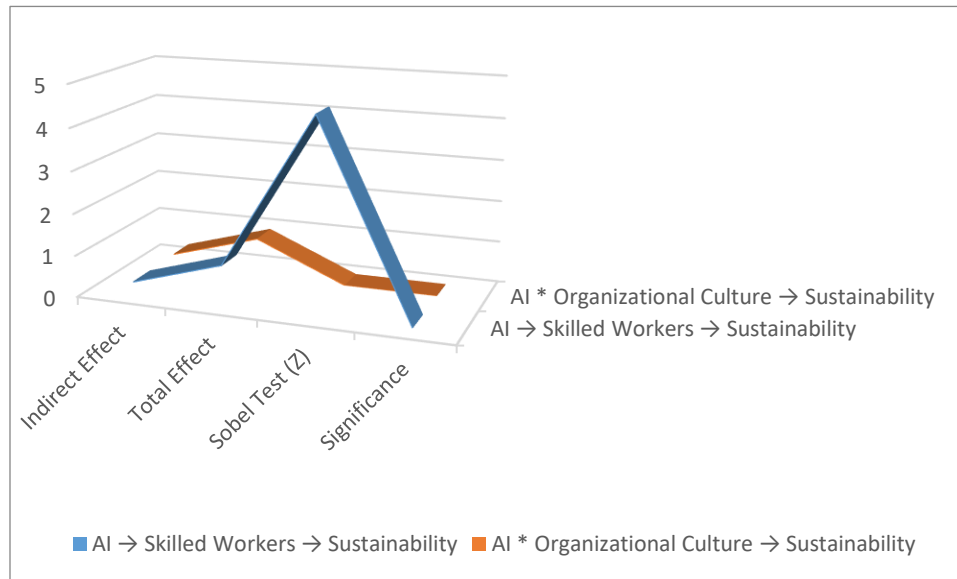
- **AI Implementation ($\beta = 0.65$):** This suggests a strong positive effect of AI on business sustainability, with every unit increase in AI implementation associated with a 0.65 increase in sustainability.

- **Skilled Workers as Mediator ($\beta = 0.55$):** Skilled workers enhance the relationship between AI and sustainability, indicating they play a critical role in translating AI into sustainable outcomes.
- **Organizational Culture as Moderator ($\beta = 0.48$):** A supportive organizational culture positively moderates the relationship, enhancing the positive impact of AI on sustainability.
- **Interaction Term (AI * Organizational Culture, $\beta = 0.30$):** The interaction term is significant; reinforcing that organizational culture influences the effect of AI on business sustainability.

Mediation and Moderation Analysis

To further explore how **skilled workers mediate** and **organizational culture moderates** the relationship between AI and sustainability, we conducted a mediation-moderation analysis.

Relationship	Indirect Effect	Total Effect	Sobel Test (Z)	Significance
AI → Skilled Workers → Sustainability	0.28	0.93	4.57	<0.001
AI * Organizational Culture → Sustainability	0.30	0.93	-	<0.001



- **Mediation (Indirect Effect = 0.28):** Skilled workers significantly mediate the relationship, explaining that their presence enhances the sustainability outcomes from AI.
- **Moderation (Total Effect = 0.93):** Organizational culture significantly moderates the direct relationship, confirming that a positive culture magnifies the effectiveness of AI on sustainability.

Discussion:

From the survey, many future business prospects insist on the importance of artificial intelligence (AI), qualified personnel, and organizational culture in increasing business sustainability. Regarding implementation of AI the respondents gave a very positive score of 4.2 and on the impact of AI to operations efficiency there is a clear agreement among the respondents that AI greatly helps to improve the business processes. Additionally, an average score of 3.8 has shown that although people recognize the efficiency of using AI it is not fully connected them to sustainability and it is in the process of development. In the light of the present study the regression equation indicates a high positive relationship between the implementation of artificial intelligence in business and sustainability coefficient of 0.65. This implies that as organizations expand their use of AI, there is a complementary improvement in sustainability. Among these factors, employees with specific skilled human capital appeared as the most important for developing and adopting AI, with the coefficient of 0.55. Not only these skilled workers are needed for the application of the AI solutions, but they also take on the crucial and strategic responsibility of creating innovations that are closer to fulfilling sustainability objectives, as the mean score of 4.2 reveals regarding encouragement for the skilled workers to innovate with AI solutions. This relationship is too moderated by the organizational culture with coefficient of 0.48 showing that when organizations provide a culture that supports the use of AI, then it enhances sustainability. This discovery is relevant given the average of 4.0 for organizational culture for the integration of AI on the part of the respondents. It is crucial to note that the culture that supports a synergy between the AI systems and employees seem inherent in addressing issues of AI resistance while at the same time promoting optimal AI/employee relations that may help in promoting sustainable AI use. Importantly, the coefficient of 0.30 to the interaction term means that organizational culture greatly contributes the impact of AI in sustainability. As shown in the mediation-moderation analysis, the interaction between competency and AI predicts sustainability with a degree of indirect effect of 0.28. This means that the engagement of experts is vital to ensuring that sustainable AI delivery is attained, and that the sustainability agenda is achieved. Moreover, having a total effect of 0.93 supports the hypothesis that a positive organizational culture also increases the advantage in the direct interaction between AI and sustainability while expanding the impact of the expertise of skilled workers. These findings indicate that in organizations that seek to use AI for sustainability, there is the need to both develop skilled worker capabilities and encourage the right organizational culture towards its use. It would be highly beneficial when training programs that impart necessary technical knowledge to the employees are accompanied by organizational measures promoting teamwork to advance the results achieved in terms of sustainability goals. In sum, the findings show a coexistence of AI and skilled workforce and supportive culture contributing to a sustainable business model thus implying the centrality of such components for business competitiveness in the future world about to embrace sustainability in business.

Conclusion:

In conclusion, the application of AI, competent workforce, and an enabling organizational environment has a critical role in improving the sustainability of business organizations. This paper

finds that the adoption of AI enhances organizational productivity and supports sustainable development provided proper execution is performed by qualified personnel. This relationship is further enhanced by a positive organizational culture because enhancing collaboration and reducing resistance to the integration of AI into the company. However, there are also some limitations of the study: the sample size and its cultural bias which make the necessity for future research with pretensions of external validity. Thus, managers are urged to purchase training, encourage people to interact and support creativity. In this way, organizations can develop a valid and effective workforce which can respond to AI induced shifts in the market successfully, which in turn helps the organizations to be sustainable for the long term in the highly competitive era.

Limitations:

Even though, this paper provides valuable information of the nature of the relationship between artificial intelligence work implementation, possession of skills by human personnel, and organizational culture for business sustainability, it is not without its limitations. First, there is a possibility of selecting a small sample of industries or organizations, which precludes generalization of the results across all industries and organizations. For example, a different picture could be produced with a wider pool of interviews across different industries, some of which are further along the AI development curve and, therefore, may have more advanced sustainability practices or conversely face starker difficulties due to sustainability issues. Also, the specify of cultural models analyzed in the present study may limit the generalization of the outcomes in organizations with different cultural background. Some more possibilities could still contain various dynamics for organizational structures within different cultural environments on AI implementation and workforce flexibility. Besides, the survey data are collected with use of self-assessment questionnaire, and thus can be informed by social desirability bias though it was to the organizations' benefit. Therefore, future research should contemplate using Longitudinal designed study to examine the dynamic changes of the above variables over time, and incorporate mix method research to explore the qualitative aspect of the employee experiences and their attitudes.

Recommendations:

To foster a culture conducive to AI adoption and workforce adaptability, managers should consider implementing the following actionable strategies:

- **Invest in Training and Development:** Organizational training should be offered in regular basis aiming to improve employees' technical know-how concerning artificial intelligence applications. Besides relating to the staff members' proficiency, such an investment also helpful in enhancing their confidence levels regarding aviation's ability to handle changes brought about by AI. Incorporating these programs to the organizational structure might benefit from the differentiation of the needs of every department.
- **Encourage Collaboration:** Eventually, nurture an environment where qualified employees are willing and able to work with those novelties and come up with valuable outcomes. This might be done with the help of project-team decision making intended to enhance

employees' cooperation that is based on the increased motivation towards problem analysis and effective solving based on numerous employees' input.

- **Promote a Supportive Culture:** Promote an organizational culture of transparency, risk taking and learning from mistakes. This means identifying and rewarding efforts that tie new advancements in AI with sustainability objectives to encourage employees to get more involved in the use of AI.
- **Communicate the Vision:** It must be possible to clearly state the organization's vision for the usage of artificial intelligence in sustainability goals. Educating the organizational employees about the gains to be won in adopting AI and how it does advance the company's long-term goals will go a long way in reducing resistance when implementing change.
- **Feedback Mechanisms:** Employees should be given avenues where through which they can express themselves about the AI use and their encounters. Employees' opinion in this case can act as feedback to target resistance and reasonably adjust AI solutions with reference to workforce competencies and preferences.

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