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Digital Transformation in Banking: Digital Leadership and Digital Innovation: A Parallel Mediation Study

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Abstract

Objectives: Present study examine the impact of digital leadership (DL) on digital innovation (DI) in the banking sector, with a particular focus on the mediating roles of digital orientation (DO) and digital capabilities (DC). The research addressed a gap in the literature by studying the process through which leadership vision transforms into innovation results through various organizational mechanisms. Methods/approach/design: The research study collect data from 365 employees working in banking institutions located in Khyber Pakhtunkhwa who held various positions including IT professionals and customer service managers and operational staff. The researchers used a random sampling method to choose participants for their study. The researchers used validated multi item scales which they adopted to the banking context and measured responses through a five point Likert scale. The researchers conducted reliability assessment through alpha while KMO and BTS tests confirmed sampling adequacy and the researchers tested hypotheses using SPSS and Hayes' PROCESS macro for mediation analysis. Findings: The study found that digital leadership (DL) significantly and positively influences digital innovation. Further, the study also investigated both digital operations and digital capabilities performed as mediators between digital leadership and digital innovation. Limitations/implications: The study is limited to only one region and one sector, which may affect its ability to generalize results. Future research should replicate the model across different sectors and cultural contexts, adopt longitudinal designs, and incorporate moderators such as organizational culture or environmental uncertainty. Practical implications: Banks should strengthen digital leadership skills, embed digital orientation in strategy, and invest in IT, cybersecurity, and analytics. A holistic approach combining leadership vision, organizational commitment, and technical resources is essential to compete with Fintech challengers. Originality/value This study provides empirical evidence that digital leadership fosters innovation through orientation and capabilities. By integrating Paradox Theory, AMO, and RBV, it advances theory and offers practical guidance for sustainable digital transformation.

Keywords: Digital leadership, digital innovation, digital capabilities, banking sector

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Introduction

Digital technologies, changing customer demands, and growing competition by Fintech providers and digital banks are all enabling a radical change in the global banking sector. The model of traditional banking that was based on the extensive use of the physical branches and manual operations is gradually being substituted by mobile applications, artificial intelligence (AI), blockchain solutions, and cloud-based platforms (Khan et al., 2022). This digital upheaval has redefined the competitive environment, making banks adopt innovation as a competitive survival and growth tool (Manzoor et al., 2024; Deloitte, 2024; PwC, 2025). Leadership, in this case, is an important part of helping organizations to go digital and make sure that innovation is integrated into banking practice. Despite extensive research on leadership styles like transformational or transactional, inclusive leadership and their relationship with organizational results, the exact contribution of digital leadership to facilitating digital innovation in the banking industry has not been well researched (Zada et al., 2024). Digital leadership is defined as the capacity of the leaders to guide and motivate the digital transformation programs and manage them in a strategic manner so that the use of technology can be aligned to the organizational objectives and customer requirements (Ahmad et al., 2022; Kane et al., 2024). Recent works point out that digital leadership promotes organizational flexibility, supports experimentation, and encourages employees to embrace new technologies, hence improving the outcomes of innovation (Manzoor et al., 2023; Al Issa and Omar, 2024). Nonetheless, leadership vision on its own is not enough, as it should be complemented with the organizational mechanisms that would make strategic intent a reality through concrete innovations.

The banking industry is a sector in which these relationships hold particular relevance. The banks are regulated, resource-based and competitive with highly competitive environments where leaders have a challenge of balancing efficiency and innovation, risk management and customer experience, compliance and agility (Ghani et al., 2022; Ma et al., 2023). Digital leadership is hence the key to resolving these tensions and promoting innovation in financial services (World Bank, 2024). Nevertheless, in spite of the paradox-based environment in the sector, the extent of empirical studies that measure the interaction between digital leadership and organizational orientation and capabilities to stimulate innovation is low. The theoretical basis of the given study is based on Paradox Theory, Ability Motivation Opportunity (AMO) model and Resource Based View (RBV). According to the Paradox Theory, leaders need to learn to manage conflicting requests including efficiency versus innovation and compliance versus agility, and paradoxical thinking can facilitate the resolution of these conflicts (Smith and Lewis, 2024). The model of AMO accentuates that leadership is a source of motivation and innovation, whereas organizational processes like digital orientation and digital capabilities promote the capacity of the employees to adopt digital solutions (Jiang et al., 2023). RBV also identifies digital orientation and digital capabilities as a valuable, rare, and inimitable asset that creates competitive advantage in a bank institution (Barney, 2024). These frameworks can be used collectively as a multidimensional perspective of how a digital leadership concept can influence innovation in the banking industry.

There are two mediating mechanisms that are very important in this context. Digital orientation is a measurement of strategic thinking and dedication to digital transformation by an organization. It makes sure that the leadership vision is incorporated into organizational practices and a culture of valuing innovation and providing technology development is created (Chen et al., 2024). Banks that are highly digital oriented tend to focus more on digital

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channels, invest in IT infrastructure and match services against customer expectations, thus converting leadership vision into innovations. Digital capabilities, conversely, include technical, IT infrastructure, data analytics, and organizational agility. They offer the capabilities and assets that can be used to implement digital strategies and offer new financial solutions (Zhang and Li, 2023). Leadership vision could be aspirational in the absence of sufficient capabilities, and successful in the presence of powerful capabilities, the banks are able to adopt advanced technologies and realize sustainable innovation.

Although the notion of digital transformation in financial services is increasingly becoming significant in the financial service sector, most of the existing literature has concentrated on technological adoption or customer behavior without paying much attention to leadership mechanisms that lead to innovation. Digital orientation and digital capabilities have been a little explored area of mediating research in the connection between digital leadership and digital innovation, especially in the banking sector. This is a wide gap because the banks have to not only engage in new technologies, but also come up with new organizational orientation and capacities to ensure that leadership vision is converted to practice.

This research study has a number of contributions to the literature. To begin with, it studies the direct impact of the digital leadership on the digital innovation within the banking industry, which is the empirical evidence on the leadership contribution to innovation. Second, it explores how digital orientation mediates the relationship between leadership and innovation, with strategic commitment to digital transformation allowing strategic leadership to promote the transformation process. Third, it examines the mediating impact of digital capabilities and shows how technical skills and infrastructure transform the vision of the leader into innovative banking solutions. Combining all these mechanisms, the research will offer a theoretical improvement as well as practical suggestions to banks aiming to use the power of digital leadership to create sustainable innovation.

Objectives

1. To examine that the effect of digital leadership on digital innovation in the banking sector.
2. To investigate the mediating effect of digital orientation between digital leadership and digital innovations in the banking sector.
3. To investigate the mediating effect of digital capabilities between digital leadership and digital innovations in the banking sector.

Literature Review

Digital Leadership

Digital leadership has essential skill within organisations that are going through digital transformation. It denotes the capacity of leaders to inspire, direct, and manage digital projects strategically and develop an innovative and flexible culture (Kane et al., 2024). Digital leadership, in its turn, is more focused on agility, readiness to experiment, and incorporation of digital technologies into the functioning of the organization, as opposed to the traditional leadership styles. The leaders in this field are supposed to strike a balance between the use of technology and the willingness to see the future so that the digital tools should be aligned with the organizational objectives and needs of the customers (Al Issa and Omar, 2024). Digital leadership is of utmost importance in the banking industry, and there it is exposed to issues like cyber security threats, compliance with regulatory regulations, and competition in the Fintech industry. Recent research has been emphasizing that digital leadership has a positive impact on employee engagement, organizational dexterity, and innovation performance, thus being one of the foundations of sustainable competitiveness (Chen et al., 2024).

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Digital Innovation

Digital innovation is the design and adoption of new digital products, services, and processes that result in improved performance and customer experience in an organization. It includes mobile applications, blockchain, artificial intelligence (AI), and cloud computing, the technologies that are also redefining industries across the globe (World Bank, 2024). Such innovation in banking occurs in mobile banking, artificial intelligence-based customer service, digitized payment systems, and blockchain-based transactions. According to scholars, digital innovation is not an issue of using new technologies but it involves a strategic vision, organizational commitment, and integration of digital solutions into the existing structures (Deloitte, 2024). This fact is supported by recent studies that digital innovation increases operational efficiency, decreases transaction costs, customer satisfaction, and, consequently, competitive advantage (Zhang and Li, 2023). Nonetheless, innovation can only be successful under the support of leadership and organizational preparedness, which emphasizes the role of digital leadership and mediating factors like orientation and capabilities.

Digital Capabilities

The digital capabilities are regarded as the technical capabilities, IT infrastructure, data analytics, and organizational agility to implement digital solutions efficiently in firms. They are the resources and capabilities that are required to turn leadership vision into real innovations (European Journal of Innovation Management, 2024). Digital capabilities in the banking industry encompass high-tier cyber security solutions, big data analytics solutions, AI-based tools of decision-making and cloud computing solutions. Scholars underline that digitization abilities are essential to maintenance of innovation because they offer the grounds to adopt and expand new technologies (Zhang and Li, 2023). In case of a lack of the necessary capabilities, leadership vision can be relegated to an aspirational level; when capabilities are strong, banks are capable of applying new technologies and providing innovative financial solutions. The recent research suggests that the connection between leadership and innovation is mediated by digital capabilities, which are needed to ensure that technical performance supports the strategic intent (Chen et al., 2024).

Digital Orientation

Digital orientation is a strategic thinking and determination of organizations to undergo digital transformation. It includes a focus on digital channels, investment in IT infrastructure, and matching services to what the customers expect in terms of seamless experiences in digital (Abbas et al., 2024). According to scholars, digital orientation is a cultural and strategic facilitator that makes sure that the leadership vision is integrated in an organizational practice. Digital orientation in banking takes the form of approaches that emphasize mobile banking, fintech partnerships, and digital services oriented towards customers. According to recent studies, the digital orientation is an intermediate between leadership and innovation, as it converts the vision of the leadership into the organizational strategies and practices (Chen et al., 2024). More digital banks will be more prone to incorporating new technologies, integrating, and motivating personnel to explore new solutions. Therefore, digital orientation is an intermediary between digital leadership and digital innovation so that the strategic commitment to digital transformation would have meaningful results.

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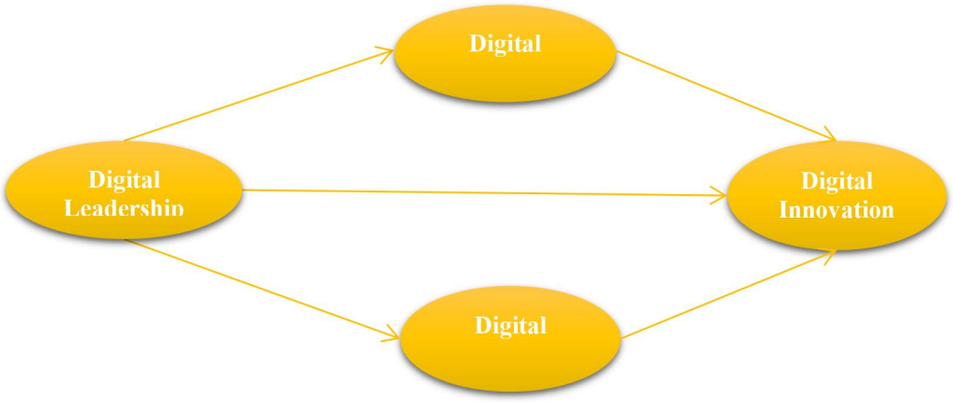
Theoretical Framework



Methodology

Population, Sample, and Technique

The population of this study was the employees who are working in the banking organization composed of IT professionals, customer service managers and operational managers in Khyber Pakhtunkhwa, Pakistan. The reason behind selecting this sector is that the banks are on the forefront of digital change, which is being challenged by regulatory compliance, cybersecurity, and competition with the Fintech firms. Simple random sampling method was used in order to give all the employees the opportunity to be selected equally. A total number of 420 questionnaires were sent to selected individuals and 365 valid questionnaires were obtained and gain 86.9 response rate. This was considered to be a sufficient sample size to use regression analysis and mediation analysis to test a hypothesis.

Collection of Data

The data were gathered at various stages in order to reduce common method bias and increase reliability. The first stage involved the measurement of demographic details and digital leadership. The second stage involved the gathering of data regarding digital orientation and digital capabilities. At the last stage, digital innovation was evaluated. This time lag method had the advantage that there was no single source bias on responses. Participants were also requested to participate at their own discretion, and the issue of confidentiality was guaranteed.

Questionnaire

Multi item scales used in previous studies were adjusted to the banking context and all construct measures were made through the validated item scales. Reactions were noted in five points Likert scale between 1 (strongly disagree) and 5 (strongly agree).

Digital Leadership (DL): 06 item scales was used to measure DL, that scale was created by Zeike et al. (2019). One of the sample items is: My leader promotes using digital tools to enhance banking services. Cronbach's alpha = 0.89.

Digital Innovation (DI): This scale is a 6 item scale, which is devoted to the creation of new digital products, services, and processes, developed by Zhu and Zhang, (2020). An example is: "Our bank is always coming up with new digital customer solutions. Cronbach's alpha = 0.87.

Digital Orientation (DO): 4-item scale was used to investigate digital orientation; this survey scale was adopted from the past study of Khin & Ho, (2019) which is how much an organization is committed to digital transformation. One of the sample items is as follows: Our bank focuses on digital channels in its strategic planning. Cronbach's alpha = 0.91.

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Digital Capabilities (DC): Measured on a scale of 5 items by Wang et al. (2022) and it includes IT infrastructure, technical expertise and organizational flexibility. One of the sample items is: "Our bank is technologically skilled to deploy new digital solutions. Cronbach's alpha = 0.92.

Analysis Technique for Data

The analysis tool SPSS were used to analyze data. Cronbach alpha was used to determine the reliability and KMO Test and the BTS Test were used to verify whether the sampling was adequate. Correlations analysis was done to test the relationship between variables. Mediation analysis of the hypotheses were conducted by hierarchical regression and bootstrapping methods, respectively, as recommended by Hayes in PROCESS macro.

Results and Analysis

Demographic

Table 4.1: ***Summary of Demographic Characteristics***

Variables	Categories	(n)	(%)
Gender	Male	210	57.5
	Female	155	42.5
Age	20–29	95	26.0
	30–39	145	39.8
	40–49	85	23.3
	50+	40	11.0
Qualification	Bachelor degree	160	43.8
	Master degree	120	32.8
	Professional Certifications (ACCA, CFA, etc.)	55	15.0
	Others	30	8.4
Experience	< 5 years	90	24.6
	5–10	140	38.3
	11–15	85	23.3
	> 15 years	50	13.8
	Total (n= sample size)	365	100%

The study found that 57.5% of participants who took part in the research were male which corresponding the gender distribution presents in the banking sector. The study showed that 39.8% of employees belonged to the 30 to 39 age range which indicated that mid-career professionals made up the largest portion of the workforce. The study found that more than 75% of participants possessed academic degrees which included Bachelor's and Master's degrees. The study found that 38.3% of participants belonged to the 5–10 years' experience category.

Scale Reliability

Cronbach's alpha (α) was used to assess internal consistency. The recommended threshold is **0.70** (Nunnally, 1978).

Table 4.2: ***Summary of Reliability Test***

Variables	Elements	α	Recommended value	Reliable
Independent variable (DL)	6	0.948	>0.70	**YES**
Dependent variable (DI)	6	0.845	>0.70	**YES**
Mediator (DO)	4	0.862	>0.70	**YES**
Mediator (DC)	5	0.781	>0.70	**YES**

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Table 4.2 shows the result of the reliability test of all the variables of the study. Internal consistency was evaluated with the help of Cronbach alpha (α) and the suggested level of this limit was 0.70 (Nunnally, 1978; Hair et al., 2023). According to the findings, all constructs were above this threshold, which proves that the measurement scales of this study are reliable.

Correlation Test

Table 4.3: ***Summary of Correlation Test***

Variable	DL	DI	DO	DC
DL	1			
DI	0.54**	1		
DO	0.49**	0.57**	1	
DC	0.52**	0.59**	0.55**	1

P < (.01)

Table 4.3 shows the correlation coefficients between the variables of the study digital leadership (DL), digital innovation (DI), digital orientation (DO), and digital capabilities (DC). All correlations are significant below p =0.01, which suggests high statistical correlations. Digital Leadership (DL) and Digital Innovation (DI): The correlation coefficient ($r = 0.54$, $p < 0.01$) indicated that it has a strong positive relation that an increased digital leadership is correlated with a high degree of digital innovation in the banking organization. Digital Leadership (DL) and Digital Orientation (DO): The correlation ($r = 0.49$, $p < 0.01$) is moderate-strong positive, which implies that efficient digital leadership is associated with more organizational orientation toward digital transformation. Digital Leadership (DL) and Digital Capabilities (DC): The association value ($r = 0.52$, $p = 0.01$) indicates the strong positive association, i.e. it is stated that digital leadership contributes to the emergence of technical skills, IT infrastructure, and organizational agility. Digital Orientation (DO) and Digital Innovation (DI): The correlation ($r = 0.57$, $p < 0.01$) indicates a positive correlation, which proves that organizations that have a high digital orientation possess a higher chance of delivering digital innovation. Digital Capabilities (DC) and Digital Innovation (DI): This is the strongest relationship of all the relationships, as the correlation ($r = 0.59$, $p < 0.01$) indicates that digital capabilities are an essential factor in the results of innovation in the banking industry. Digital Orientation (DO) and Digital Capabilities (DC): The correlation value ($r = 0.55$, $p < 0.01$) is positive and strong, indicating that the organizations that have a high digital orientation have a high likelihood of establishing strong digital capabilities, which subsequently facilitate the process of innovation.

KMO and BTS

Table 4.4: ***Summary of KMO and BTS Test***

Construct	KMO	(BTS)	P	Recommended (KMO,BTS)	Decision
DL	0.84	312.45	.000	> 0.70, p<.001	Yes (Adequate)
DI	0.87	298.72	.000	> 0.70, p<.001	Yes (Adequate)
DO	0.82	276.93	.000	> 0.70, p<.001	Yes (Adequate)
DC	0.81	254.18	.000	> 0.70, p<.001	Yes (Adequate)

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Table 4.4 shows that all constructs attained KMO values above 0.80, which exceeds the recommended threshold of 0.70, confirming sampling adequacy for factor analysis. The correlation matrices examined in this study showed suitable structure detection because all constructs reached statistical significance with a p value less than .001 in BTS Test of Sphericity. The results of these tests demonstrate that the data set meets requirements for conducting reliability testing, validity assessment, and regression analysis in the banking sector study.

Hypothesis Testing

Table 4.5: ***Summary of Hypotheses H1, H2, H3***

Path / Effect	β	t-value	95% CI (LL–UL)	Sig.	Supported
DL → DI	0.52	9.65	—	.000	**YES** (H1)
DL → DO → DI (Mediation)	0.13	—	0.07 – 0.19	.001	**YES** (H2)
DL → DC → DI (Mediation)	0.15	—	0.08 – 0.21	.000	**YES** (H3)

In above table 4.5 shows summary of all study hypotheses testing. In H1, digital Leadership has significant and positive influence on Digital Innovation (b= 0.52, t = 9.65, p =.001), implying that a high level of digital leadership has positive impact on the outcome of innovations within the banking organization. This confirmed that digital innovation is a main driver with regards to leadership vision and management. In H2, the mediation analysis revealed that, digital orientation mediates the relationship between digital leadership and digital Innovation (b=0.13, 0.0719, p <.001). It suggests that better role of leadership in innovation is when banks embrace a strategic approach to digital transformation. In H3, digital orientation mediates the relationship between digital leadership and digital Innovation (b=0.15, CI = 0.08 -0.21, p =. 001). This suggests that the leadership vision can be more efficiently transformed into innovation in the case of high technical expertise, IT infrastructure, and organizational agility.

Discussion and Conclusion

The research survey was conducted among employees in the banking sector of Khyber Pakhtunkhwa, Pakistan, and the sample comprised IT professionals, customer service managers, and operational staff. This group has been chosen due to the fact that banks are on the frontline of digital change, and have to overpower issues of regulatory compliance, cybersecurity, and even competition by Fintech companies. Out of the 420 questionnaires sent out, 365 valid responses were received, which provided 86.9 percent of the questionnaire response. This was determined as a sufficient number of such samples to conduct regression and mediation analysis, which meant the statistical power and representativeness. The SPSS and Hayes PROCESS macro of mediation test were used for analyzing data. The measure of reliability was done by use of Cronbach alpha with all the constructs above the recommended 0.70 indicating internal consistency. The KMO test and BTS were used to test the adequacy of the sampling, and the two tests had the necessary minimum of 0.70 and 0.001 respectively (KMO > 0.70, p < .001). Adaptation of multi item validated scales in previous studies was made to the banking setting: Digital Leadership (Zeike et al., 2019), Digital Innovation (Zhu and Zhang, 2020), Digital Orientation (Khin and Ho, 2019), and Digital Capabilities (Wang et al., 2022). Everything was measured in a five point Likert scale with the lowest being 1 (strongly disagree) and the highest being 5 (strongly agree). This methodological consistency made the data gathered to be accurate, acceptable, and testable. These findings validate the fact that Digital Leadership (DL) has a significant, and positive impact on Digital Innovation (DI) (b=

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0.52, p <.001). Moreover, Digital Orientation (DO) (β = 0.13, CI = 0.07019, p <.001) and Digital Capabilities (DC) (β = 0.15, CI = 0.0820.21, p <.001) were also revealed to mediate the relationship between leadership and innovation. These results suggest that digital leadership cannot attitude unaccompanied and needs to be supported by organizational orientation to the digital transformation and strong technical skills to transform strategic intent into sustainable innovation products. The results are in agreement with previous studies. Kane et al. (2024) and Chen et al. (2024) stressed that digital leadership improves the performance of an organization in terms of agility and innovation. Abbas et al. (2024) and Khin and Ho (2019) emphasized the importance of the use of digital orientation as an element in instilling leadership vision in organizational practices. In a similar vein, Wang et al. (2022) and Zhang and Li (2023) confirmed that IT infrastructure and data analytics are important enablers of innovation that are driven by digital capabilities. This research recognizes and confirms these mediating processes in the banking organization by contributing to the existing literature and making empirical findings that leadership, orientation, and capabilities together promote digital innovation in highly regulated and competitive markets.

Implications

Theoretical Implications

This research has a number of valuable contributions to theory because it combines the Paradox Theory, and the Resource Based View (RBV) into a digital leadership and innovation model in the banking organizations. To begin with, the results also establish that Digital Leadership (DL) has a positive impact on digital innovation (DI), which narrows the scope of the leadership literature to other styles of leadership like transformational or transactional leadership. The empirical justification of DL as a specific construct makes the research solidly argues that leadership in the digital era needs special competencies like agility, experimentation, and alignment to technology (Kane et al., 2024; Chen et al., 2024).

Second, the digital orientation (DO) and digital capabilities (DC) mediation roles are intensely novel. DO is revealed as a strategic enabler that inserts leadership vision in organizational culture and practice whereas DC is the technical and infrastructural resources that convert vision into tangible outcomes of innovation. It is this dual mediation that brings forward RBV; positioning DO and DC as valuable, unique, inimitable, and non-substitutable assets, which generate sustainable competitive advantage (Barney, 2024). It also confirms the AMO model on the digital platform, indicating that leadership brings motivation and opportunity, whereas orientation and capabilities improve the capability of employees to be innovative (Jiang et al., 2023). Third, the research paper enhances the Paradox Theory by demonstrating how banking leaders are able to cope with the tension between efficiency and innovation, compliance and agility, risk management and customer experience. The findings indicate that paradoxical thinking, in which organizational orientation and organizational capabilities are encouraging, can help leaders to eliminate these tensions and generate innovation. This adds value to the literature of paradox, particularly in providing empirical evidence based on a very regulated and resource intensive sector.

Practical Implications

As a manager, the results offers a number of practical implications, that how banking institutions in the digital transformation should act. First, the focus on digital leadership development should be complete. Banks need to invest in digital skill training programs, which enable leaders to possess digital skills such as strategic technology alignment, agility, and paradoxical thinking. The vision of leadership should be conveyed in an effective and regular manner in order to encourage employees to be open to digital transformation. Second,

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the organizations must intensify their digital orientation through integrating digital priorities in the strategic planning, resources allocation, and cultural values. These involve targeting digital platforms, developing a relationship with Fintech solutions, and changing services in line with new customer demands. The high orientation provides the leadership vision which is not an aspirational one but is integrated into the daily organizational activities. Third, the digital capabilities in terms of IT infrastructure, cybersecurity, big data analytics, and organizational agility should be invested by the banks. In the absence of these, leadership vision will be symbolic; in the presence of them, it will be operational. Managers are supposed to invest in technical skills and make sure that the staff is well versed with the latest digital solutions to implement the same. Fourth, the results imply that the synergy of leadership, orientation, and capabilities is the key to competitive advantage in the banking industry. Managers ought to be holistic whereby the leadership vision is backed with the organizational commitment and technical resources. This will facilitate banks to act in response to Fintech competition, regulatory pressures, and client needs to have smooth digital experiences. Lastly, the research provides some lessons appropriate to other industries including hospitality, healthcare and manufacturing. The digital leadership has the potential to lead to innovation in customer service, operational efficiency, and product development, but only when organizations develop digital orientation and develop strong capabilities in these industries.

Limitations and Future Directions

Limitations

This study has a numbers of limitations. First, the study was also only carried out in the banking organizations in Khyber Pakhtunkhwa, Pakistan, which could restrict the extrapolation of the findings. However, the banks in this region are reflective of the institutions in the process of digital transformation; the applicability of findings could be affected by the differences in culture, regulations, and economy across nations and industries. Future researches should put into consideration cross country comparisons to ascertain the universality of the proposed model. Second, the study adopted a cross sectional study design which was used to gather data at single point in time. Although mediation analysis offers valuable insights into causal mechanisms, the cross-sectional design of this study limits our ability to establish causality or elucidate the temporal, dynamic development linking digital leadership to innovation. Longitudinal studies would be more appropriate in order to identify how leadership, orientation, and capabilities will change with time and how it will always have an effect on the outcomes of innovation. Third, the self-reported questionnaires lead to the potentials of common method bias and social desires bias. Despite the measures (time lagged data collection and promise of confidentiality) implemented to reduce these risks, respondents are still likely to have given an answer based on the organizational expectations and not necessarily what transpired to them. The validity of the future study can be enhanced by including multi source data (e.g., the assessment by managers, the measure of performance, or customer review). Fourth, this study did not examine all the possible mediating mechanisms but only two, i.e., digital orientation and digital capabilities. These are essential enablers, but there are other aspects of organizations like culture, top management support, or environmental uncertainty that might have some important roles to play in leadership-innovation relationship. The omission of factors weakens the comprehensiveness of the model. Lastly, the paper lacked the explicit analysis of the correspondence of digital leadership and innovation to the sustainability models like the United Nations Sustainable Development Goals (SDGs). Since the focus on responsible innovation and sustainable digital transformation is growing, the future research ought to focus on how leadership and

organizational processes can have wider societal impacts such as SDG 9 (Industry, Innovation, and Infrastructure) and SDG 8 (Decent Work and Economic Growth).

Next Study

Based on these limitations, a number of research directions are suggested in the future. First, scholars are to repeat this research in another industry where the digital transformation is just as essential, including the hospitality field, health sector, and manufacturing. This would permit sectoral comparisons and accentuate industry specific mediating mechanisms. Second, longitudinal or mixed methods designs should be used in the future to reflect the dynamic aspects of digital leadership and innovations. Evolution of organizations would be more insightful in terms of the change of leadership vision and the adaptation of orientation and capabilities to varying technological and market conditions. Third, the researchers can consider the moderating variables, which might affect the strength of the mediation effects. To demonstrate it, organizational culture, environmental turbulence, or regulatory frameworks might enhance or diminish the effect of digital leadership on innovation. The ability to test these moderators would enhance the theoretical model and offer finer recommendations to the managers. Fourth, objective performance indicators should be mentioned in the future work, including the output of innovations, financial performance, or customer satisfaction indicators. This would be in addition to self-reported data and would bring a more rounded picture of the leadership and innovation relationship. Lastly, future studies need to be specifically focused on the impact of digital leadership and innovation on sustainability and SDGs development. Connecting the leadership practices to the sustainable innovation outcomes, scholars can prove that digital transformation can also lead to the organizational competitiveness as well as the development of society.

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