

**Digital Leadership to Innovative Management Excellence:
Revolutionizing Potential through Knowledge Management Behavior**

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Abstract

Digital leadership has become a key force of new management excellence especially in knowledge-based and digitally developed settings. Although previous research has pointed at its role in enhancing the creativity and innovation of employees, the effects of digital leadership on the entire range of knowledge management behaviors (KMB) acquisition, sharing and application- as a means to achieve long-term innovation outcomes have not been well identified yet. This research paper is based on the Knowledge-Based View (KBV) and Social Cognitive Theory (SCT) to investigate how digital leadership mediates relationship with innovative management excellence in relation to KMB among IT professionals working in Punjab, Pakistan. The study is a quantitative cross-sectional survey research, the population of which includes mid-level managers, team heads, and knowledge workers of medium to large IT companies. Stratified random sampling was employed in order to have both geographic and organizational diversity, and 355 valid responses were received. The analysis of data was performed according to the descriptive and reliability analysis with the help of SPSS, whereas the direct and mediated relationships were tested with the help of the Partial Least Squares Structural Equation Modeling (PLS-SEM). Measurement and structural models were assessed as reliable, convergent as well as discriminant validity. Results suggest that digital leadership can improve to a considerable degree knowledge acquisition, sharing, and application behaviors and

therefore, positively impact the innovative management excellence. Knowledge application behavior among the mediators was the most predictive indicating that transformation of knowledge gained to application innovation is important. The findings also confirm the mediating status of KMB that will show that digital leadership can stimulate innovation by behavioral processes and not direct leadership impact. This paper adds theoretical value involving the combination of digital leadership and multi-dimensional approach to KMB and organizational innovation that moves KBV and SCT to a modern digital realm. In practice, it provides practitioners with provide management with insights that can be put into practice to develop a knowledge-centric culture and improve organization innovation. It is suggested that future studies be conducted to address the contextual moderators like technology readiness and trust, use longitudinal designs, and adopt cross-industry implementations to confirm even further the mediated framework.

Keywords: Digital Leadership, Knowledge Management Behavior, Innovative Management Excellence, Knowledge-Based View, Social Cognitive Theory, PLS-SEM

Background Information

Digital leadership has become influential in creating innovative management excellence in developed economies; this has been achieved in large part by its influence on knowledge management behavior (KMB) among employees. In newer studies, digital leaders are modeled as those who do not merely utilize technology, but strategically use technology to impact, empower and organize employees in such a manner that creates organizational flexibility and creativity (Yang, Talha, et al., 2025). Digital leadership was observed in one recent multi-wave, multi-source study of a large Chinese firm in the process of digital transformation whereby it is found that digital leadership significantly positively affected the creativity and performance of employees; that is, knowledge sharing mediated a portion of that association, and another portion of that relationship was mediated by innovation self-efficacy (Yang, Talha, et al., 2025). It implies that the behavioral part of KMB in particular, namely, exchanging knowledge through digital media is a necessary process through which digital leadership can be turned into creative results.

Besides, the impact of digital leadership on KMB is justified by the social exchange theory: when employees develop trust, reciprocity, and open communication via digital tools, the exchanged knowledge will be publicized thus establishing a more abundant source of shared wisdom (Yang, Talha, et al., 2025). Another observation by the study found that the effects are moderated by technology readiness whereby the more comfortable and confident employees are with the digital technologies, the more they react to digital leadership on self-efficacy and sharing knowledge. The above results highlight that under developed or highly digitalized conditions, the combination of both digital leadership and the individual-level factors (such as tech readiness) considerably influence the development of knowledge behavior.

Besides, there is limited research demonstrating that digital leadership is positively connected to frugal innovation under developed conditions through knowledge sharing (Cheng, 2025). Digital leadership in this paper increased knowledge sharing that consequently led to frugal innovation- i.e. resourceful innovation that conforms to competitive markets. This mediating sharing-effect presents the manner in which digital leadership can make organizations be led towards innovation, which is not only innovative, but also lean and sustainable.

In addition to corporate environments, community resilience has been the subject of research, which is also useful in understanding how knowledge sharing is a behavioral platform to support digital leadership. As one example, a recent form of moderated mediation has shown that digital leadership is a significant predictor of knowledge sharing within communities, which in turn enhances resilience within the community although to a relatively lesser extent compared to when the community trust is substantial (Zhao et al., 2025). Albeit not in a corporate context, this represents the generalizability of the leadership-KMB association in evolved social environments and demonstrates that trust is a limiting condition of knowledge behavior.

Going by the knowledge management theory, the knowledge creation processes, integration, sharing and application processes have been empirically observed to be related to innovation performance within organizations in advanced economies. Indicatively, one research, based on the Journal of Innovation and Knowledge, revealed that the effect of KM on organizational performance is mediated by innovation when companies focus on the four processes of KM (Cristache, 2025). It suggests that it is no longer the structural KM systems or knowledge management behavior that is the key facilitator in converting the KM practices into actual innovation deliverables.

When added together, these results suggest a model where digital leadership (in the developed-country situation) is the driver of knowledge management behavior (particularly sharing, although also acquisition and application), which leads to innovative work behavior and ultimately management excellence. The fact that the moderating role that technology readiness (Yang, Talha, et al., 2025) and trust (Zhao et al., 2025) have indicate further the fact that the effectiveness of this mechanism is dependent on both individual and contextual factors. Therefore, to those organizations who want to achieve innovative management excellence especially in well developed digital economies, advancing digital leadership should be accompanied with the expansion of knowledge sharing cultures, microing trust, and securing the digital competence of employees.

Problem Statement

In spite of the fact that digital leadership is becoming an important contributor to the innovation process, there is a gap in the current literature in developed economies that provides clear explanations of the role of digital leadership in influencing knowledge management Behaviors (e.g., acquisition, sharing, application) to result in continued innovative performance. Although some of the foundational worker has established the capabilities digital leaders need including digital insight, cross-boundary

collaboration, and dynamic adaptation (Tigre et al., 2023) most empirical studies have focused on direct leader- outcome relationships instead of referencing the micro-Behavior al processes through which these capabilities are converted into innovation. As an illustration, Yang, Talha, Zhang, and Zhang (2025) demonstrate that knowledge sharing mediates the association between digital leadership and employee creativity, but they quantify sharing, not the entire range of the knowledge behavior and use time-lagged survey instead of designs. Equally, Wang et al. (2025) illustrate the mediation of the effects of digital leadership on innovative performance by job crafting again circumventing the fundamental KM Behavior s.

Simultaneously, the research of knowledge management still demonstrates that the power of innovation remains not only in the sharing of knowledge but also in a more complex structure of various processes of knowledge: the creation of knowledge, its integration, implementation and sharing (Scuotto, Croitoru & Florea, 2025). Nevertheless, the literature on leadership is marked by a conspicuous lack of research that would establish digital leadership as the association of this entire repertoire of KM processes. In the absence of such connection, our perception of how digital leadership is a systematic way of constructing a knowledge-based culture, other than an ad hoc sharing, is superficial, especially in highly digitized, controlled, or resource-rich conditions.

In addition, despite an increase in digital leadership studies in developed country settings, much of it is specific to a specific industry (e.g. tech manufacturing) or locality, which does not permit generalization. Researchers have not investigated whether the Behavioral effect of digital leadership on knowledge management applies to areas of knowledge management like healthcare, finance or government administration where regulatory or data governance and risk management factors can be a strong determinant of knowledge Behavior. Almost no more discussed are the possible adverse Behavioral impacts of digital leadership: it is the aspect that little research so far focuses on whether digital leadership, aiding the sharing of knowledge, breeds information overload, technostress, or knowledge hoarding espoused by guarded knowledge management, which is of vital interest in highly developed economies.

Overall, although the results of digital leadership are empirically intimately related to the outcome of innovation, there is a missing link: no multilevel longitudinal, cross-country study has ever shown how digital leadership can lead to the entire gamut of knowledge management behaviors (not only sharing) or how the contextual factors and conditions that could moderate or inhibit such behavioral influence should be considered. This disconnect restricts both conceptual and practical advice: whilst organizations can invest in digital leadership, they might not achieve the objectives of the enterprise in terms of innovation and management excellence unless they comprehend and mold Behavioral foundations of KM.

Aim of the Study

This study will seek to test the effect of digital leadership impacts on innovative management excellence and determine the mediating concept through which digital

leadership impacts on innovative management excellence having the mediating concept of knowledge management behavior (acquisition, sharing and application) among the professionals in the IT sector in Punjab, Pakistan.

Research Objectives

To evaluate how digital leadership influences the behavior of employees in terms of knowledge acquisition, knowledge sharing, and knowledge application.

To determine the immediate impact of digital leadership on excellent management innovation

To investigate how knowledge management behavior (acquisition, sharing and application) is related to innovative management excellence.

To examine how digital leadership is mediated by knowledge management behavior in the connection between digital leadership and innovative management excellence.

Significance of the Study

This study will be important because it will enable the researchers to address a key gap in the research and practice by helping people understand how digital leadership (not only in establishing a vision of change in the use of technologies) triggers knowledge management behaviors (acquisition, sharing, and application), which are prerequisites to long-term innovation and management excellence. Even though the relationship between leadership and innovative outcomes has been demonstrated in the previous studies, most of the studies have investigated broad leader-outcome association without delving into the details of the behavioral processes that transform digital strategic intent into organizational knowledge practices (Nguyen, Sharma, and Malik, 2023). This paper advances the understanding of the knowledge based view (KBV) and the dynamic capabilities theory by defining the black box of behavior in relation to mobilizing the resources of leadership into the generation of value in that knowledge Behavior s are influenced by digital leadership.

Practically, the results of the study have significant implications to the organizational transformation process. Digital leaders are in a unique position in which they can shape the manner in which employees can manage knowledge within a rich technological environment; knowing the Behavior s that are relevant, and how these Behavior s can be cultivated, can assist organizations develop specific interventions to realize the best out of the digital investments. Digital leadership can promote organized learning and efficient implementation as one example, thus resulting in more sustainable outcomes of innovation as opposed to creative outbursts. This becomes crucial in the present day environment where companies are putting a lot of money towards digital transformation and still finding it very difficult to incorporate a continuous innovation in their daily running of business (Khilji, Nikolic & Rehman, 2024).

What is more, concentrating on knowledge Behavior, as opposed to merely adopting technology, this study adopts an essential issue on the literature: the means of guaranteeing that the digital, in turn, is converted into the actual organizational learning and competitive advantage. According to knowledge-management research,

digital systems will never be enough; behaviors like active knowledge sharing and applications must be present otherwise the value of digital tools would not be as achieved (Khilji, Nikolic and Rehman, 2024). Through the connection between leadership, behavior and innovation, the study has provided practical findings that can be used by leaders to implement policies, cultures and reward mechanisms that will enhance beneficial knowledge practices.

Lastly, this study is timely considering that digital change is becoming more complex and faster. Recently, digital leadership has been shown to impact not only knowledge sharing but also green digital innovation due to knowledge sharing Behavior s in the contexts of higher learning institutions (BMC Psychology, 2025), making it clear why the relevance of knowledge management to the entire society and its sustainability is fundamentally pertinent in digitally transformed organizations (Iqbal et al., 2025). The study can contribute to the academic asset of the research and the managerial practices that focus on the application of knowledge in ethically and strategically sound practices by examining the dynamic aspects of this topic.

Literature Review

Digital leadership the ability of leaders to use digital technologies beyond infrastructure, but as a tool of power, has become a popular topic in the recent organizational research. Systematic reviews demonstrate that the role of digital leadership works in many-fold directions: digital strategist, change agent, and knowledge orchestrator (Lopez Figueroa, Ochoa Jimenez, Palafox Soto & Hernandez Munoz, 2025). Its strength is proven in the empirical studies: Karafakioglu and Findikli (2024) define the digital leadership as the effect that impacts the innovative behavior and organizational agility positively and is mediated by the work engagement, which means that digital leaders can be used to mobilize employee energy and creativity in regards to the digital transformations.

Nevertheless, the role of digital leadership on the knowledge management behavior (KMB) and especially, the entire knowledge acquisition, sharing, and application complex is not studied. Although sharing is important in many studies, the behavior of knowledge is a deeper multi-dimensional concept. As an illustration, knowledge sharing has been identified to have a positive impact on organizational innovativeness and performance in knowledge-intensive business service firms (Skerlavaj, Cerne, and Dysvik, 2024). According to their research (in Journal of the Knowledge Economy), horizontal and vertical knowledge flows, which occur due to managerial Behavior , can make contributions to the process of innovation.

Digital knowledge management (DKM) studies, in general, are a source that signifies the relevance of all three behavioral aspects. Conceptualizing DKM, Gao, Chen, and Jiang (2025) regard it as a complex of acquisition, sharing and application and prove that all dimensions influence the innovative behavior of employees working in technology-enabled environment positively. They also indicate that outcomes of innovation reinforce as employees embrace exploitive form of learning (refinement of knowledge) more than exploration, but this connection is undermined by techno stress

(particularly challenge stress). This implies that the behavior of knowledge is not merely of multi-layered nature, but rather it is digital work sensitive.

The research of leadership indicates that there is an indirect correlation between leadership and knowledge behavior, but that is a significant one. In their Journal of Knowledge Management paper (2023), Nguyen, Sharma and Malik explore how various types of leadership (transactional, transformational, creative) impact online knowledge-sharing, and conclude that online sharing accounts for the impact of leadership on employee creativity. Although it is not a case of digital leadership, this paper demonstrates that the leadership styles that include the aspects of relationship and creativity considerably affect the knowledge sharing Behavior .

Moreover, paradoxical leadership, such a style where leaders have to reconcile opposing demands (e.g., stability and change) has been observed to positively contribute to knowledge sharing Behavior , which is mediated by promotive voice and trust (Beaumont and others, 2024). Their article in Administrative Sciences (Dinamia'CET, Portugal) highlights that the relational aspect of leadership, psychological safety, and trust are essential to motivate the employees to share what they know especially through volatile and intricate organizational environment (Ogan et al., 2024).

Empirical researches in the Italian-based sector also support the mediating factor of knowledge Behavior s in the promptation of innovation, thus, from the innovativeness side. In a study of 316 employees in IT companies, Alvi, Ahmad and Safdar (2024) indicate that there is an intermediary between KM practices and innovation through team creativity mediated by knowledge application (and presence of sharing). Based on the Knowledge Based View (KBV), their work demonstrates that it is highly important to facilitate the sharing of knowledge as well as the implementation of the knowledge to teams to facilitate innovation.

Combinations of all these studies indicate a chain: digital leadership (or leadership in general) affects KMB Behavior s (particularly, sharing, although all could be related) and vice versa. However, the important missing data point is that although many studies have been conducted recently (in high impact/SSCI journals) on digital leadership, they have not empirically measured the three KMB dimensions: management level innovation excellence (not individual creativity or work behavior). Such a gap renders a mediated model not only plausible, but also necessary as the insights on how digital leaders can influence knowledge behavior in digital settings is essential towards translating leadership into the long-term, strategic innovation.

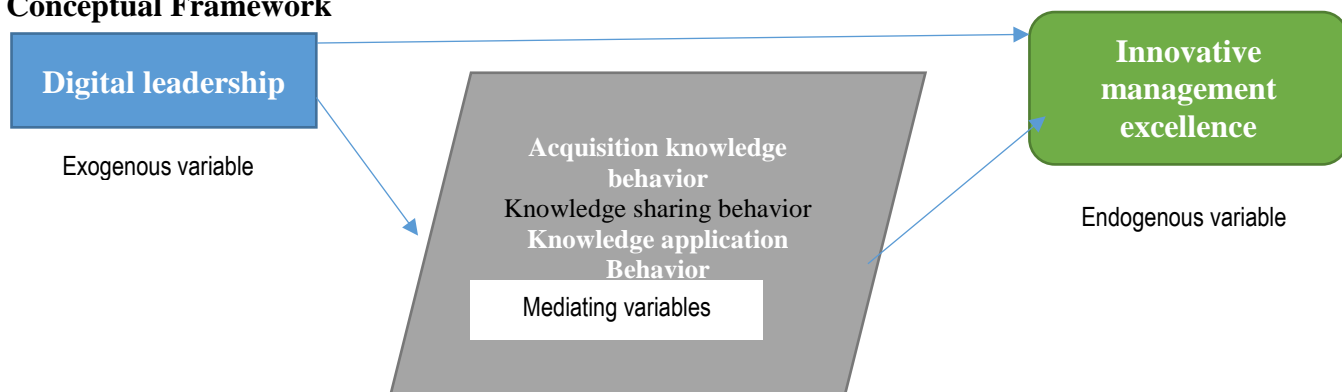
Underpinning Theory

This mediated model best fits the theoretical foundation of Knowledge Based View (KBV) of the firm. According to KBV, the most important strategic resource is knowledge and the ability of the organizations to create, share and use knowledge efficiently is the source of competitive advantage (Grant, 1996). Digital leadership may be perceived through the prism of KBV as a process that mobilizes and influences knowledge resources, i.e. not only to employ digital tools, but learn new things, disseminate what they already know, and implement insights in innovative work.

In addition to KBV, the Social Cognitive Theory (SCT) can be used to understand the means and motivation behind digital leadership to influence individual knowledge Behaviors. The SCT (Bandura, 1986) proposes that people acquire Behaviors through modelling and build self-efficacy which is the belief that they have the ability to execute actions. Besides existing in the form of a Behavioral role model, digital leaders may undertake practical actions to show that they are knowledge-seeking, knowledge-sharing, and knowledge-applying Behaviors (such as use of digital tools themselves, inviting open dialogue, and physically using knowledge to make decisions) are appropriate role models, as well as instilling in employees a sense that they too can perform such Behaviors. This will eventually create a knowledge centric culture where employees will be confident and willing to participate in knowledge Behaviors that lead to innovation.

Accordingly, incorporating KBV and SCT makes a good theoretical basis of a mediated model: digital leadership (a resource orchestrating role) KMB (acquisition, sharing, application) innovative management excellence.

Conceptual Framework



Based on literature and underpinning theory, it proposes the following hypotheses:

H1: Digital leadership positively correlates with the acquisition behavior of knowledge.

H2: Knowledge sharing behavior is positively related to digital leadership.

H3: Digital leadership has a positive relationship with knowledge application Behavior.

H4: There are positive relationships between knowledge acquisition behavior and innovative management excellence.

H5: There is a positive relationship between knowledge sharing behavior and innovative management excellence.

H6: The knowledge application behavior correlates positively with innovative management excellence.

H7: Knowledge management behavior (as a latent construct of the acquisition, sharing and application) mediates the relationship between the digital leadership and innovative management excellence.

Methodology

The present research is quantitative and cross-sectional survey design, as the researcher intends to investigate the interrelationship between digital leadership and knowledge management behavior and innovative management excellence, using knowledge management behavior as a mediating factor. In organizational studies, cross-sectional surveys are prevalent to evaluate the hypotheses both at one time and infer the relationship among the latent constructs based on the statistical procedures (Creswell, 2017; Shahzabi, 2023). The design will enable the investigation of both direct and indirect impacts of digital leadership on innovative management excellence in terms of knowledge management Behavior s.

The subject population will be IT professionals recruited to handle mid-level managers, team leads and knowledge workers with medium to large-sized IT firms within Punjab, Pakistan. The choice in this case of the IT industry can be explained by the fact that the industry is inherently digital and knowledge-intensive in nature, thus making it an appropriate environment to examine the effects of digital leadership on knowledge behavior and innovation (Gao, Chen, and Jiang, 2025; Lopez-Figueroa, Ochoa-Jimenez, Palafox-Soto, and Hernandez-Munoz, 2025).

The study uses stratified random sampling in order to be representativeness. Punjab will be categorized in geographical layers (e.g. Lahore, Faisalabad, Rawalpindi) and the size of companies (small, medium, large IT firm). The stratified sampling minimizes the sampling bias and guarantees that there is diversity in case of geographical and organizational traits (Saunders, Lewis, and Thornhill, 2012).

The sample will be between 400 and 500 people, depending on the organizational research standards on testing structural models on the basis of Partial Least Squares Structural Equation Modeling (PLS-SEM) (Hair, Ringle, and Sarstedt, 2022). This adequacy is big enough to gain statistical power in performing both direct and mediating effect concerning SEM analyses.

The data collection involves the use of the structured questionnaire, which will be administered online using corporate emails and intranet distribution channel, and in paper form to organizations that wish to administer the questionnaire face-to-face. The scales of measurements are borrowed on validated instruments that have been used in earlier studies. Digital leadership refers to items based on Zhu, Zhang, Xie, and Cao (2022), whereas knowledge management behavior is estimated through three dimensions, namely acquisition, sharing, and application (Gao, Chen, and Jiang, 2025). The innovative management excellence is assessed with a scale scaled down by Wang, Park, and Gao (2025), which comprises managerial level innovation results and process level innovation results. All things are rated on a 7 point Likert scale with 1 referring to strongly disagree and 7 strongly agree.

To conduct the data analysis, SPSS is utilized with the use of preliminary analyses, such as descriptive statistics, reliability test (Cronbachs alpha), and correlation

analysis. PLS-SEM is suitable in models with latent constructs and mediation, as well as for predictive purposes in organizations where the researcher aims to analyze mediation and hypotheses are hypothesized (Hair, Ringle, and Sarstedt, 2022; Henseler, Ringle, and Sinkovics, 2009). The effects of knowledge management behavior on mediators are tested and undergo bootstrapping to identify the importance of the indirect effects in line with the modern methodology of SEM.

Ethical issues are observed to the letter. The participants are briefed on the nature of the research, and they are guaranteed anonymity and confidentiality, after which they will give their consent before participating in the research. Respondent attendance is optional and they will be allowed to pull out of the study at any point of time.

Independent Variable (IV)

Digital Leadership (DL)

Definition With the help of digital technologies, the leadership style creates influence on employees, promotes sharing of knowledge, and becomes an innovative and dynamic one.

Measurement: With the help of validated scales of digital leadership (e.g. inspired by El Sawy et al., 2023; Zhu et al., 2022)

Dimensions: Visionary thinking, gaining digital influence, encouraging technology adoption, encouraging digital collaboration.

Dependent Variable (DV)

Innovative Management Excellence (IME)

Definition: How the management actions and organizational practices promote the innovation in processes, products and services.

Measurement: These are gauged by organizational innovation or management excellence results with the use of scales (e.g., Luu, 2023; Wang et al., 2025).

Indicators Process innovation, product/service innovation, adoption of new technologies, managerial performance in innovation

Mediating variables

Behavior of Knowledge Management (KMB)

Definition: Behaviors of employees with regard to the acquisition, sharing, and utilization of knowledge to enhance the organizational results.

Measurement: Selected based on Gao, Chen & Jiang (2025); has three dimensions:

Knowledge acquisition (KA): Search and acquisition of relevant knowledge.

Knowledge Sharing (KS): Sharing knowledge inside with colleagues and teams.

Knowledge Application (KAP): The Information to work with knowledge in solving problems or innovation.

Data Analysis

The main data of this study was gathered in the IT professionals of Punjab, Pakistan. In order to get the sufficient response rate, 420 questionnaires were dispersed among the sample of mid-level managers, team leads and knowledge workers. Among them

375 questionnaires were returned and the preliminary response rate was 89.3. After initial screening, it was also discovered that 3 questionnaires were either incomplete or improperly filled and were not included in the dataset which resulted in 372 valid responses to analyze.

Preliminary data analysis was done in SPSS (Version 26). Primary data cleaning was the verification of the absence of values and the identification of possible outliers using univariate as well as multivariate analysis. The data containing a decent amount of missing data and gross outliers were removed to ensure the integrity of the data. This process made a total of 23 more responses to be dropped and a total of 355 responses was obtained to be analyzed later. It was found that the final dataset was adequate to perform Structural Equation Modeling (SEM) with a sufficient sample to parameter ratio according to the general SEM principles (Hair, Black, Babin, and Anderson, 2019).

In order to analyze the general characteristics of sample and distribution of responses across the variables, descriptive statistics were used to determine the proportion of the sample and responses. Cronbach alpha was used as the reliability test that helped to measure internal consistency of the scales, and was also assessed by measuring factor loadings, Average Variance Extracted (AVE), and Fornell-Larcker criterion (Hair, Hult, Ringle, and Sarstedt, 2022). Correlation analysis was done to study the initial relations between the study variables.

Partial Least Squares Structural Equation Modeling (PLS-SEM) was used to test the proposed factors of interrelation and was done through SmartPLS Software (Version 4). The reason behind selecting PLS-SEM is that it is powerful when working with complex models that contain latent constructs, predictive analysis, and it can be used to test the mediation effect (Hair, Ringle, and Sarstedt, 2022; Henseler, Ringle, and Sarstedt, 2015). Bootstrapping procedures with 5,000 resamples were used to determine the significance of the indirect effects of Knowledge Management Behavior in the relation between Digital Leadership and Innovative Management Excellence.

Measurement Model

The measurement model is used to seek the reliability and validity of the constructs in the study after which the structural relationships are tested through PLS-SEM.

Figure 1. Measurement Model



Table 1. Outer loadings

	Acquisition Knowledge Behavior	Digital Leadership	Innovative Management Excellence	Knowledge Application Behavior	Knowledge Sharing Behavior
AKB1	0.838				
AKB2	0.844				
AKB3	0.853				
AKB4	0.467				
AKB5	0.479				
AKB6	0.831				
DL1		0.857			
DL2		0.746			
DL3		0.847			
DL4		0.871			
DL5		0.87			
DL6		0.869			
DL7		0.859			
IME1			0.832		
IME2			0.827		
IME3			0.851		
IME4			0.81		

IME5	0.835	
IME6	0.838	
IME7	0.781	
IME8	0.772	
KAB1		0.775
KAB10		0.819
KAB2		0.739
KAB3		0.751
KAB4		0.747
KAB5		0.744
KAB6		0.819
KAB7		0.827
KAB8		0.807
KAB9		0.81
KSB1		0.618
KSB2		0.615
KSB3		0.605
KSB4		0.826
KSB5		0.818
KSB6		0.799

The outer loadings in the measurement model are useful in giving information about the reliability and validity of the indicators of each construct. In the case of Acquisition Knowledge Behavior (AKB), the loadings have been varying between 0.467 (AKB4) to 0.853 (AKB3). A majority of the items such as AKB1, AKB2, AKB3 and AKB6 have high loadings of above 0.8 meaning that they are good measures of the construct. But, AKB4 and AKB5 as 0.467 and 0.479 respectively are less than 0.6 that is acceptable level and the case may require eliminating or redefining them as weak indicators to improve the quality of the model.

In Digital leadership (DL), the outer loadings are between 0.746 (DL2) and 0.871 (DL4), and all the items achieve the desired 0.7 mark. The high reliability and validity of this particular tool is exhibited through this superior consistency in all indicators and attest to the fact that the measurement model of DL is sound and needs no urgent modifications.

Also, there are good outer loadings in Innovative Management Excellence (IME) with a minimum of 0.772 (IME8) and maximum 0.851 (IME3). Each of the items is above the 0.7 mark, a measure of reliability and validity of the construct. In turn, the model used to measure IME is valid and does not require any adjustments.

In the case of Knowledge Application Behavior (KAB), the loadings are between 0.739 (KAB2) and 0.827 (KAB7), and all items have substantially exceeded the 0.7 thresholds. This implies that both the indicators are good representations of the construct, and the measurement model of KAB is reliable and valid.

And finally, the coefficients of the outer loadings of Knowledge Sharing Behavior (KSB) lie between 0.605 (KSB3) and 0.826 (KSB4). KSB4, KSB5 and KSB6 show high loadings above 0.799, whereas KSB1, KSB2, and KSB3 also have significantly lower loadings of less than 0.62, and it means that they are weak predictors of the construct. These could be reconsidered or removed in order to enhance the total measurement model of KSB.

Overall, as most of the constructs have high outer loadings, which make them viable measurement models, some specific issues can be identified with regards to AKB and KSB because they have weak indicators. To tackle these low loadings by either more inquiry or refinement of the model is important so as to improvise the number of the average of the measurement model.

Table 2. Reliability

	Cronbach's Alpha	rho_A	Composite Reliability	(AVE)
Acquisition Knowledge Behavior	0.814	0.829	0.872	0.547
Digital Leadership	0.934	0.937	0.946	0.717
Innovative Management Excellence	0.93	0.93	0.942	0.67
Knowledge Application Behavior	0.93	0.931	0.941	0.616
Knowledge Sharing Behavior	0.822	0.852	0.864	0.519

Reliability and Validity

The findings indicate that there is a high internal consistency of all constructs. In the case of Acquisition Knowledge Behavior, Cronbach's Alpha (0.814), rho, A (0.829) and Composite Reliability (0.872) are greater than the recommended value of 0.70, which shows reliable measurement. The AVE = 0.547 exceeds the minimum of 0.50 which establishes the acceptable convergent validity.

Here, the reliability is high with Cronbach Alpha (0.934), rho A (0.937) and Composite Reliability (0.946) indicating values which are way above the 0.70-0.90 ideal range. AVE of 0.717 indicates high variance explained by the indicators which indicates a high level of convergent validity.

On the same note, the reliability of Innovative Management Excellence is very high with Alpha (0.930), rho A (0.930) and CR (0.942) all being high in comparison. The AVE of 0.670 shows that the construct explains over fifty percent of the indicator variance, which indicates the strong convergent validity

In the case of Knowledge Application Behavior, the reliability indicators, Alpha (0.930), rho A (0.931) and CR (0.941) are once more outstanding. The AVE of 0.616 is within the required threshold which gives good convergent validity.

Finally, Knowledge Sharing Behavior is also suitable in terms of reliability, with Cronbach's Alpha (0.822), rho A (0.852) and CR (0.864) presenting internal consistency. The minimum level of AVE is 0.227 and the value of 0.519 is greater than this value, which proves that the levels are satisfactory.

Table 3. Validity (Fornell Larcker Criteria)

	Acquisition Knowledge Behavior	Digital Leadership	Innovative Management Excellence	Knowledge Application Behavior	Knowledge Sharing Behavior
Acquisition Knowledge Behavior	0.739				
Digital Leadership	0.311	0.847			
Innovative Management Excellence	0.517	0.346	0.819		
Knowledge Application Behavior	0.473	0.305	0.814	0.785	
Knowledge Sharing Behavior	0.436	0.238	0.731	0.772	0.721

The Fornell-Larcker Criterion is used to determine discriminant validity and all the constructs in the model are different. Based on this requirement, the AVE (diagonal values) square root must be greater than the correlations with other constructs (off-diagonal values). The diagonal values in your model, namely; Acquisition Knowledge Behavior (0.739), Digital Leadership (0.847), Innovative Management Excellence (0.819), Knowledge Application Behavior (0.785), and Knowledge Sharing Behavior (0.721), are higher than the corresponding correlations with other constructs. This indicates that every construct has more similarity with its indicators as compared to a different construct.

Generally, the findings reveal acceptable discriminant validity. The constructs are all empirically unique implying that the model has been able to differentiate between acquisition, application, and sharing of knowledge as well as between digital leadership and innovative management excellence. This enhances the validity of the measuring model and increases the reliability of further interpretations of structural models.

Table 4 HTMT

	Acquisition Knowledge Behavior	Digital Leadership	Innovative Management Excellence	Knowledge Application Behavior	Knowledge Sharing Behavior
Acquisition Knowledge Behavior					

Digital Leadership	0.353			
Innovative Management Excellence	0.602	0.369		
Knowledge Application Behavior	0.544	0.324	0.822	
Knowledge Sharing Behavior	0.535	0.265	0.79	0.845

The results of the HTMT shows that your model has satisfactory discriminant validity of all constructs. The correlation of Acquisition Knowledge Behavior with the others such as that of Digital Leadership (0.353), Innovative Management Excellence (0.602), the Knowledge Application Behavior (0.544), and Knowledge Sharing Behavior (0.535) are all well below the allowed values of 0.85 or 0.90. It implies that Acquisition Knowledge Behavior is obviously different to all these variables.

On the same note, the values of HTMT between Digital Leadership and Innovative Management Excellence (0.369), Digital Leadership and Knowledge Application Behavior (0.324) and Digital Leadership and Knowledge Sharing Behavior (0.265) are very low. These findings prove that Digital Leadership is a distinct construct that lacks much conceptual overlap with the other ones.

Innovative Management Excellence-Knowledge Application Behavior relationship (0.822) is greater than the rest of the values but still falling within the acceptable range. This indicates that there is a relationship between the two constructs and they are yet to be sufficiently different. The HTMT value between Knowledge Application Behavior and Knowledge Sharing Behavior (0.845) is also within the maximum allowed value meaning close yet acceptable differentiation.

On the whole, there is no values of the HTMT that exceeds the recommended ceiling of 0.85/0.90, which proves that there is a presence of discriminant validity. The constructs in your model represent different things and none of them overlaps with the others, which is positive evidence of the strength of your measurement model.

Structural Model (SEM-PLS)

Figure 2. Structural Model



Total Effects Interpretation

The results of the structural model indicate that all the hypothesized relationships are statistically significant because the p-values = 0.000 (or less) and t-values are significantly greater than 1.96. To begin with, Digital Leadership produces a high and meaningful impact on all three mediating variables. It has a positive effect on Acquisition Knowledge Behavior ($b = 0.311$, $t = 5.361$), Knowledge Application Behavior ($b = 0.305$, $t = 6.037$) and Knowledge Sharing Behavior ($b = 0.238$, $t = 4.506$). These findings imply that increased Digital Leadership is an effective way of increasing knowledge acquisition, usage, and sharing in individuals or employees. Also, the model indicates that the overall effect of Digital Leadership on the Innovative Management Excellence is significant ($b = 0.346$, $t = 6.973$). This implies that Digital Leadership does not only have a direct impact on innovation but also an indirect influence via the mediating knowledge-related behaviors. Knowledge Application Behavior has the biggest effect on the Innovative Management Excellence ($b = 0.644$, $t = 11.676$), which indicates that knowledge application is the strongest force behind innovation results in the model. The other behavior that promotes innovation in a positive way is Knowledge Sharing Behavior ($b = 0.141$, $t = 2.515$), although to a lesser degree.

Lastly, there is a significant and moderate impact of Acquisition Knowledge Behavior on Innovative Management Excellence ($b = 0.127$, $t = 3.59$). This is an indication that the act of knowledge acquisition is a contributor of innovative performance, but not as much as the act of application and sharing of knowledge.

Table 5. Total Effect

	Original Sample (O)	Standard Deviation	T Values	P Values
Acquisition Knowledge Behavior -> Innovative Management Excellence	0.127	0.035	3.59	0.002
Digital Leadership -> Acquisition Knowledge Behavior	0.311	0.058	5.36	0.001
Digital Leadership -> Innovative Management Excellence	0.346	0.05	6.97	0.000
Digital Leadership -> Knowledge Application Behavior	0.305	0.051	6.03	0.000
Digital Leadership -> Knowledge Sharing Behavior	0.238	0.053	4.50	0.001
Knowledge Application Behavior -> Innovative Management Excellence	0.644	0.055	11.6	0.000
Knowledge Sharing Behavior -> Innovative Management Excellence	0.141	0.056	2.51	0.015

Specific Indirect Effects – Mediation

The outcomes demonstrate Knowledge Application Behavior gives the most significant mediating impact between Digital Leadership and Innovative Management Excellence. The coefficient of indirect path is 0.197 and t-value is high at 5.549 ($p = 0.000$), which shows that mediocre is significant and substantial. This implies that Digital Leadership can enhance innovative excellence through the ability of employees to transfer knowledge into practice primarily.

There is also a mediating relationship between Digital Leadership and Innovative Management Excellence through Acquisition Knowledge Behavior, which has a lesser influence ($b = 0.039$). The correlation is statistically significant ($t = 2.883$, $p = 0.004$), which indicates that the Digital Leadership is partially mediated, that is, it contributes to the increase in the innovation in addition to raising the amount of knowledge acquisition, but this relationship is less strong than that of knowledge application.

Likewise, the mediating effect of Knowledge Sharing Behavior is also substantial but small ($b = 0.033$, $t = 2.102$, $p = 0.036$). This implies that Digital Leadership serves on the excellence of innovations by stimulating knowledge sharing among employees, but this route is the least solid among the three mediators.

All in all, the findings indicate that the three knowledge based behaviors play a significant mediating role in Digital Leadership on Innovative Management Excellence, with Knowledge Application as the greatest and Knowledge Sharing as the least significant mediator.

Table 6. Specific Indirect Effect

	Sample	Standard Deviation	t value	p values
Digital Leadership Behavior ----> Knowledge Application Innovative Management Excellence	0.197	0.035	5.549	0
Digital Leadership Behavior ----> Acquisition Knowledge Innovative Management Excellence	0.039	0.014	2.883	0.004
Digital Leadership Behavior ----> Knowledge Sharing Innovative Management Excellence	0.033	0.016	2.102	0.036

R Square

This means that Acquisition Knowledge Behavior has an R square (0.096) that indicates that Digital Leadership explains 9.6 percent of the variation of the digital leadership. This implies that there is a weak level of prediction according to the general levels (0.25 = weak, 0.50 = moderate, 0.75 = substantial). This implies that Acquisition Knowledge Behavior is a mediator with a small yet a positive influence of Digital Leadership.

In the case of Knowledge Application Behavior, the R squared of 0.093 also suggests weak explanatory expertise as the Digital Leadership does not account for any more than 9.3 percent of variance. This implies that Digital Leadership is not an important predictor of this mediator, but there is some effect.

On the same note, the R Square of Knowledge Sharing Behavior is very low at 0.057, which implies that Digital Leadership has been able to explain just 5.7 of its variance. This once again reveals poor predictive strength, indicating that Digital Leadership does not have a lot of direct impact on this go-between.

Contrarily, in case of Innovative Management Excellence, greater predictive power is shown by the R Squared of 0.736. It implies that Digital Leadership along with the three mediators explains 73.6 percent of the variance on the Innovative Management Excellence. The high value demonstrates that the mediators play a significant role in strengthening the impact of Digital Leadership on this outcome thus they have a strong mediation structure.

Table 7. Determination R²

	R Square	R Square Adjusted
Acquisition Knowledge Behavior	0.096	0.094
Innovative Management Excellence	0.736	0.733
Knowledge Application Behavior	0.093	0.091
Knowledge Sharing Behavior	0.057	0.054

The off-diagonal values show the degree of correlation among constructs. As an example, the Digital Leadership demonstrates the insignificant yet positive correlation with the Acquisition Knowledge Behavior (0.107) and moderate correlation with the Knowledge Application Behavior (0.103), which indicates that the greater the digital leadership, the more likely it is to be related to the above-mentioned knowledge behavior.

Acquisition Knowledge Behavior has a reasonably close relationship with Knowledge Application Behavior (0.519) meaning that those who performance acquire knowledge will also have high chances of application. The rest of the correlations (Digital Leadership and Innovative Management Excellence 0.019), or Knowledge Sharing Behavior and other constructs (0.026-0.06) are extremely weak indicating that there is limited association between the two variables.

In general, it can be concluded that the relationship between Acquisition and Application of Knowledge is strong, and Digital Leadership and Knowledge Sharing are less associated with other constructs in the model. This may mean that knowledge behavior interventions may be based more on the acquisition and use rather than leadership or a sharing intervention per se. **Table 8. Specific Effect f^2**

Acquisition Knowledge Behavior	Digital Leadership	Innovative Management Excellence	Knowledge Application Behavior	Knowledge Sharing Behavior
Acquisition Knowledge Behavior		0.045		
Digital Leadership	0.107	0.019	0.103	0.06
Innovative Management Excellence				
Knowledge Application Behavior		0.519		
Knowledge Sharing Behavior		0.026		

Conclusion of the Study

This paper examined how Digital Leadership affects the influence of the Innovative Management Excellence with knowledge-related behaviors (Acquisition Knowledge Behavior, Knowledge Application Behavior and Knowledge Sharing Behavior as the mediators). The measurement model exhibited high levels of reliability and validity stating that all constructs were measured reliably and consistently. The structural model also provided that the Digital Leadership exhibits significant adjustment of predictive potentials in each of the three knowledge practices, directly affecting the Innovative Management Excellence.

Knowledge Application Behavior came out as the most prominent predictor of Innovative Management Excellence among the mediators, making it notable that acquiring knowledge and changing it into a working action would facilitate the enhancement of innovation. There was also significant positive effect on Knowledge Acquisition Behavior and Knowledge Sharing Behavior though their effects were not that significant. The identified indirect effects verified that all three knowledge-related behaviors are mediating the Digital Leadership to innovative outcomes relationship, with the Knowledge Application that offers the largest mediating pathway.

In general, the results derive at the conclusion that there is a direct and indirect relationship between Digital Leadership and Innovative Management Excellence in the sense of reinforcing the knowledge-related processes of the organization. The study indicates that such leaders who are effective in applying digital tools, induce the flow of knowledge and stimulate the utilisation of the knowledge in a practical manner, provide conditions which greatly enhance the performance of innovation. These findings add theoretical information to knowledge management and leadership literature as well as provide empirical information to organizations that need to become more innovative in the digital age.

Implications of the Study

The present research has employed a considerable implication on the theory, practice, and policy of leadership, knowledge management, and innovation. In the theoretical point of view, the research contributes to the realization of Digital Leadership as it shows both the direct and indirect impact on the Innovative Management Excellence by the knowledge-driven behaviors. Specifically, the fact that Knowledge Application Behavior was the most significant mediator highlights the significance of knowledge-to-strategy translation in society as the means of enhancement of innovation. The study therefore fills the gap in literature by combining leadership and knowledge management in a digital world, which gives researchers a guideline on how to study how digital tools and the knowledge processes combine to lead to innovation in a given organization.

In business managerial perspective the findings indicate that managers ought to actively use digital platforms and tools in facilitating knowledge intake, distribution and utilization among the staff. The training and leadership development programs must focus on the connection between theory and practice and see to it that the

information and knowledge received are converted into the innovative practices. Further, a culture of knowledge sharing and teamwork can be cultivated to enhance the channels under which digital leadership can enhance innovation to ensure more companies are able to attain greater heights of management excellence.

In practice, organizations that have to work in changing digital contexts may develop a competitive edge through matching leadership strategies with knowledge management practices. Companies can develop knowledge flow and use, and with the help of digital leadership behaviors, the performance of innovation can be increased, and the growth of the organization in the long term can be maintained. Additionally, policies and systems that are geared towards promoting innovation built on knowledge can enable the employees to acquire, share and utilise knowledge in a better manner to supplement the general innovation speed in the firm.

Last but not least, in a policy-level, the paper shows the necessity of efforts that facilitate the growth of digital leadership abilities on industrial corporate levels. The policymakers and regulators can contribute towards formulating standards, guidelines, and programs that can institutionalize knowledge-based innovation practice to ensure that the organizations are well equipped to cope with challenges and opportunities of the digital era. In general, the research offers practionable ideas on scholars, managers, and policy makers interested in improving innovation with the help of strategic leadership and effective knowledge management.

Future Directions

Based on the results obtained in this study, one can determine some directions of research future. To begin with, although in this study the mediator role of knowledge-related behavior in the Digital Leadership and Innovative Management Excellence was investigated, the subsequent studies can investigate other mediators or moderators, including organizational culture and employee engagement or technological preparedness to better understand the innovation process.

Second, organizations in a particular context or region were chiefly examined in the study. The future study can take the cross-industry/ cross-country approach to explore whether the associations between the digital leadership and knowledge behaviors and innovation are valid across different cultural or economic settings. This would be able to give a clue on the extent of generalizability of the results and emphasize on a situation specific aspect affecting the innovation performance.

Third, the long-term effects of Digital Leadership on knowledge behaviors and innovation outcomes could be researched by the implementation of longitudinal studies. The temporal development of leadership practices and knowledge processes can offer additional information on how to maintain the innovative management excellence on a dynamic digital environment.

Last but not least, future research can also be offered into integrating new technologies, including artificial intelligence, big data analytics, and the digital collaboration platforms, to investigate the interplay between the identified tools and leadership behaviors and knowledge management processes to further improve innovation. Treating these orientations, the researchers can build on the current study

and create a more comprehensive picture of the mechanisms and digital leadership by which innovative and organizational excellence are mobilized.

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