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With Dual Mediation Mechanism Unpacking the Impact of Digital Leadership on Innovative Work Behavior

Ihsan Ul Haq[1], Umar Farooq[2], Usman Nasir[3], Hasina Khatoon[4], Syed Taqi Ul Hassan[5], Abdu Saboor[6] & Faiza Shafi[7]

[1]*Master of Business Administration, Faculty of Management Sciences, IIU Islamabad, Pakistan, Email: ihsanulhaqiiu@gmail.com*
[2]*Visiting Lecturer IIU Islamabad, Visiting lecturer & Resource Person at AIOU Islamabad, Pakistan, Email: malikumar731@gmail.com*
[3]*Research Scholar, Department of Management and Administrative Science, IIU Islamabad, Pakistan, Email: usmannasir041@gmail.com*
[4]*Lecturer, Shifa Tameer-e-Millat University Islamabad, Pakistan, Email: hasina_khatoon.dms@stmu.edu.pk*
[5]*MBA from University of Central Lancashire Preston, Manchester, UK, Email: Taqisyed434@gmail.com*
[6]*Department of Management & Administrative Science, University of Gujarat, Pakistan, Email: abdulsaboor697@gmail.com*
[7]*Department of Management Science, Baluchistan University of Information Technology and Management Science, Quetta, Pakistan, Email: Faizashfi905@gmail.com*

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Corresponding Author:
Usman Nasir
Email:
usmannasir041@gmail.com

ABSTRACT

Organizations are working to innovate in the age of digital transformation. According to shifts in management environments, which are closely linked to creative work practices, leadership is specifically evolving into digital leadership. This study clarified the role of digital culture and employees' digital capabilities in perspectives on digital leadership by focusing on employees' innovative work behaviors. Using a survey focused on digital leadership, digital culture, employees' digital capabilities, and employees' innovative work behaviors, this study gathered data from 295 employees working for Pakistani companies. It then used SPSS software to test its hypotheses. The findings demonstrate that innovative work practices are positively impacted by digital leadership both directly and indirectly. Furthermore, the relationship between digital leadership and creative work practices in Pakistan is partially mediated by digital culture and employees' digital capabilities. By demonstrating the importance of digital leadership in creative work practices, this study advances the field of leadership and resource-based view (RBV) research.

Introduction

Recent advancements in digital technology and the expansion of digital transformation threads have caused a shift in traditional business strategies and procedures (Holzmann and Schwarz 2020). Businesses are being encouraged by these developments to enhance their resources in order to compete with rivals. Examples of how the emergence of digital technology is igniting a new wave of the industrial and economic revolution and radically altering organizational administration include artificial intelligence, block chain technology, cloud computing, big data, 5G, and edge computing (Peng 2021). Digital transformation, according to some, is the process of integrating more and better technologies in a dynamic digital environment while also attempting to balance organizational culture, people, structure, and tasks.

The digital transformation era is a time when businesses are developing innovations. Leadership is specifically evolving to become digital leadership in response to changes in management settings, which have a substantial impact on organizational performance. Organizations require leaders with capabilities that go beyond the fundamentals of organizational management and behavioral competence. It is as important, if not more so, for business leaders to retain their competitiveness and survival in the context of a quickly evolving and imaginative digital world as well as in the face of expanding globalization (Holzmann, Schwarz and Audretsch 2020). Traditional business strategies and practices are altering as a result of recent advances in digital technology and the growth of digital transformation threads (Wesseling, Bidmon and Bohnsack 2020). Organizations are being compelled by these shifts to modernize their resources in order to achieve a competitive edge.

The use of technology combined with transformative leadership is what defines as digital leadership (Mihardjo, L.W.W.; Sasmoko, S 2019). A crucial element is also how to use culture and digital competency to drive change and capitalize on technology. The development of digital leadership, which makes use of the benefits of digital technology and improves organizational performance, also combines leadership qualities with digital aptitudes. Therefore, digital leadership as combining transformative leadership and digital skills (Amelda, Alamsjah and Elidjen 2021). A leadership position that combines the use of digital technology and the transformational leadership stance is known as "digital leadership" in leadership theory.

Given that digital leadership adapts and modifies corporate strategy, businesses must thrive in the new digital era. In the corporate contexts of today's digital culture, rapid change is valued. The term "digital culture" here refers to an Endeavour that examines some of the most significant and dramatic phenomena carried on by the increasing importance and pervasiveness of digital technology. As a result, this study is conducted in the context of the Pakistani industrial sector. Numerous studies have examined how different performance-related behaviors and leadership interact (Sarros, Cooper and Santora 2011). Digital leadership has a good effect on organizational capabilities in the modern day (Jagadisen 2021). Additionally, it has been discovered that digital leadership influences innovative work behavior and that subjective wellness and digital training have a favorable influence on workplace motivation (H.H. and Aydin 2022). Additionally, numerous performance outcomes are impacted by digital leadership. For instance, it has been discovered that digital leadership influences both the innovation of business models and the growth of the digital ecosystem.

Digital culture is the expanding body of norms, practices, and expectations for how people (should) interact and behave in a modern networked society. Furthermore, digital culture fosters

innovation and the generation of fresh information, which in turn aids in the development of new goods and services (Duerr, S.; Holotiuk, F. 2018). Additionally, even if digital transformation is carried out with the use of computers, firms are still required to hire individuals with computer-related expertise. Businesses must also exploit this shift towards a digital mentality as a strategic chance to invest and make money. Since they are in charge of selecting, organizing, teaching, and persuading one or more followers, leaders play crucial responsibilities in organizations. The rise of threads in the digital sphere and recent improvements in digital technology has caused traditional corporate strategies and processes to change (Holzmann, Schwarz and Audretsch 2020). The aim of the study is to use two mediating mechanisms to investigate the influence of digital leadership on innovative work behaviors.

In order to be socially and digitally linked and to fully utilize the benefits of the digital era for all stakeholders in the fast-paced business environment, organizations must embrace technology (Holzmann and Schwarz 2020). Despite some research' claims to the contrary, practitioners in the higher education sector have shown interest in the idea that digital leadership fosters and supports digital teaching and learning (Yusof 2019). However, there hasn't been a lot of research on how digital leadership fosters or stifles innovative work behavior. In order to achieve organizational success, innovative work behavior is essential; hence it's crucial to comprehend how digital leadership influences this kind of behavior (De Araujo, L.M.; Priadana 2021). In order to support the leadership literature theoretically, it is also essential to address this topic. Our study aims to show how digital leadership affects employee behavior in innovation by doing this. According to previous research, there seems to be a knowledge gap on how digital leadership affects employees' digital competencies and culture. A variety of mediating factors as they analyzed digital leadership as a key component in many future scenarios (Erhan and Uzunbacak 2022). Future technological cultures may also be put to the test, which could significantly affect innovation (Khin and Ho 2018). The factors above that isn’t currently the subject of research, such as aspects of digital culture, may therefore be interesting to investigate (Weritz, Braojos and Matute 2020). The importance of digital culture in enterprises is also emphasized by a similar point of view put forth by (Adie et al. 2022).

Leaders are credited for creating the innovative culture and methods. The apparel sector will be at the forefront of the creation of new products in the future, according to a report by one of the leading textile companies, by leveraging the most cutting-edge automation technologies. To effectively manage the present digital environment, a different leadership style is required as well-known leadership approaches might not be sufficient to succeed in the modern era. In order to implement and disseminate the idea of innovation throughout the businesses, this new leadership style must include all of the leadership qualities, rather than fully eschewing the more conventional forms of leadership (Haddud and McAllen, 2018). This study investigates the significance of digital leadership and its impact on it in an effort to shed light on it since innovative work behavior is the successful work outcome for all organizations. Organizational capabilities and digital leadership are related who have spent ten years studying digitalization (El Sawy and Kræmmergaard 2022). SMEs' long-term competitive advantages are largely derived from their digital competency (Aramburu and North 2021). However, it's still unclear what exactly goes on when it comes to employees' digital aptitude and cutting-edge working practices. In light of this, this study think that the digital capabilities of leaders, organizations, and employees all have the potential to impact the development of creative work practices. In order to close the gaps mentioned above, this study developed a study model in the Pakistani context that employs two mediating factors to measure the impact of digital leadership on innovative behavior. In order to

show how organizational culture and digital capabilities function as mediating factors, this study aims to establish the link between digital leadership and innovative behaviors.

Companies today need qualified leaders rather than managers because of the international economy. In addition to looking for new technologies, organizational needs like the requirement for a human workforce have been one of the issues that might be overlooked. The ability to motivate this human workforce has demanded a variety of skills from leaders. This study looks into how employees' innovative work behaviors are impacted by digital leadership in this regard. In this study, mediators include employees' digital skills and the digital environment in which leaders and workers interact.

Research Objectives of our study are as:

- Is to analysis effect of digital leadership on innovative work behavior
- Is to analyze the mediating role of digital culture between digital leadership and innovative work behavior
- Is to analyze mediating role of employees' digital capabilities in the relationship between digital leadership and innovative work behavior

Literature Review

Effects of Digital Leadership on Innovative Work Behaviors

Organizations must change to the digital era in order to prevent these harmful effects. Therefore, in order to thrive in the digital age, leaders must possess the skills of teamwork, task orchestration, creativity, and adherence to best practices (Beresford 2019). This relevance sparked the development of a cutting-edge leadership strategy that deviates from the emphasis on "commanding and controlling" leadership. By emphasizing the executives' digital intelligence, this strategy helps the organization become more proficient, prosperous, and aware in the digital environment (Timurcanday Özmen 2021). The phrase "digital leadership" describes conventional leadership from the digital era. According to observations, these leaders' aptitude for innovation, digital proficiency, solid networks, teamwork, involvement, and vision are their most crucial traits (Toduk 2020).

People who combine their leadership skills with digital technologies are valuable to their organizations. They call it "digital leadership" (Rudito and Sinaga, 2020). Digital leaders are individuals that adopt different leadership philosophies (transformational, transactional, etc.) and oversee the digital transformation processes consistently while providing competitive advantages from a strategic standpoint (Sow and Barbie, 2023). According to (Mihardjo and Sasmoko 2019), define digital leadership as the confluence of digital culture and digital talents. Businesses must innovate to stay competitive in view of the rapid technology improvements (Iqbal et al., 2020b). Businesses have consequently requested reforms in a variety of areas, including job design (Bysted, 2013) The changing customer demands brought on by digitalization have increased the requirement for employees to adopt creative behaviors and explore for new methods to fulfill these demands (Li et al., 2019).

Innovative work behavior refers to the actions taken to instigate, direct, and carry out original or beneficial ideas, works, processes, and procedures for businesses (De Jong, 2021). The knowledge, abilities, and experiences of the employees play a role in a multi-stage process that results in

innovative work behavior (Sethibe and Steyn, 2017). These factors have an effect on this motivating atmosphere as well (Bammens, 2016). Innovative work behavior is a challenging activity that improves performance on both a personal and organizational level, generates new ideas, and calls for additional role behavior. The most effective leaders of today will be technically savvy and the first to adopt new developments in the digital sphere (Mintzberg 2010). Leaders are those who have this skill. Organizational leaders need to be flexible and have the ability to see things from different angles as their organizations go through digital transitions. Concept discovery must be supported by strong digital leadership skills.

Employees that work for digitally savvy managers might focus on fresh ideas and try to spread them in support of organizational goals. In other words, digital leaders support their team members in coming up with novel solutions to critical problems. In contrast to traditional leadership styles where people accept the leader's judgments as being solely and accurately, without challenge, leaders who are open to change and fresh investigation of the ideas can also benefit society and aid in the advancement of innovation.

It's possible to view innovation as a requirement rather than as something new. Organizations are expected to offer more competitive and innovative products or services to fulfill the expectations of clients whose preferences are always changing (Beresford 2019). As a result, ideas begin to form when presented with both anticipated and unanticipated situations. Through the innovation process, all of the organization's stakeholders can contribute fresh ideas, and it is well known that the organization's leaders embrace these contributions and actively encourage the introduction of new concepts. It should be emphasized that, in line with this, organizational leaders' support can aid the emergence of innovative ideas. Research has shown, in particular, that managers who are proficient in digital tools encourage their personnel to share their opinions on the workplace and make them feel important to the business. Keeping up with the most recent technology developments has also become essential since digital leaders have the ability to usher in a new era in their companies by implementing certain technologies (Tremblay 2022).

The second part of the idea exploration process, idea generation is one of the innovative work behavior's dimensions and is referred to as "the repetitive sequence of tasks that relate collecting, sharing, and recoding ideas" (Gama et al., 2019: 115). Organizations must share an openness to change when adopting change in any sector since this promotes and supports innovation (Auernhammer and Hall, 2020). To the benefit of the organizations, leaders' understanding of their present abilities has been viewed as an essential component of contemporary leadership in the digital era (Barrett, 2006; Bagheri & Akbari, 2018). The role of the digital leaders is to draw employees' attention to duties that need them to learn about the market at the moment and develop strategies by pitching concepts to businesses. (Bagheri and Akbari, 2018). Furthermore, executives that are digitally engaged or quickly adaptable to new transformations may view workers with fresh ideas as new possibilities.

The process of idea creation may help organizations become more inventive. This level of creative work behavior necessitates management and employees' cooperation and communication. The innovative proposal's proponent should encourage the other participants to debate the benefits and drawbacks of the recently updated or potentially superior ideas before implementing the plan. The third trait of innovative behavior—idea championing—must be clarified in this circumstance. The term "active promotion of a novel idea, necessary power to move the ideas into practice by persuading the allies" is used to describe idea championing (De Jung and Den Hartog, 2021).

Additionally, the field of innovation requires champions and leaders who exhibit great self-confidence and inspire others to support the invention (Maidique, 2017).

Employees must support a new technology in order to not miss innovative opportunities, in addition to having leaders who can develop new ideas and make it feasible for new changes to occur in organizations (Kickul and Gundry, 2022). A workplace should be supported by digitally skilled leaders persuading the workforce to engage in each particular activity, since digital leadership is a combination of digital culture and digital competency (Mihardjo. et al., 2019). The idea implementation phase, the last stage of innovative work behavior, starts after persuading the employees/allies during the concept championing phase. When it is put into practice, the concept of the champion will be used. When the idea is recognised and valued by others inside the business, the execution of the creative concept can begin with excitement (Fried and Hisrich, 2019). Because having an idea accepted by others does not ensure that it will be implemented, (Baer, 2022) this dimension is seen as the conclusion of the innovation process rather than the end of the journey (PerrySmith and Mannucci, 2017). The result or product of innovative work behavior is therefore the execution of ideas. Leaders need to adapt to new digital business models as businesses become more digital and move quickly to enter this digital world (El Sawy et al., 2016). Under the guidance of their digitally savvy leaders, employees should become acclimated to the novel products and services, culture, and are eager to participate in innovation. However, this procedure has been regarded as the innovation's last stage.

H1. *There is positive relationship between the digital leadership and the innovative work behaviors.*

The Effect of Digital Leadership on the Digital Culture and the Employees' Digital Capabilities

In order to maintain organizational stability in the face of digital growth and change, organizations must deal with digital culture. It is challenging to adapt to the digital culture without the support of digital leaders who are specialists at strategic thinking and who take advantage of changes in digital technology to generate new business prospects that benefit their clients (De Araujo and Priadana 2021). Additionally, it is asserted that a leader have the ability to persuade, assisting in the creation of a new digital culture to handle the digital environment and opening the door for the achievement of long-term goals. Additionally, the resource-based view (RBV) paradigm is utilized to explore how organizational culture and employees' digital abilities mediate (Matzler and Schwarz 2008)……

The concept of "digital culture" describes how the Internet and technology have an impact on how people connect with one another. It makes references to how we behave, think, and speak to one another in public. The field of digital leadership research is a subset of the greater study of leadership, according to (Hambrick and Mason 2002) upper echelons hypothesis. A digital leader is tasked with creating or supporting the change of cultures, particularly the establishment of digital cultures, in order to increase a company's competitiveness. They create and carry out the organization's strategies as well. The innovative behaviors of employees are impacted by digital leaders, according to the authors of an earlier research, and this influences organizational performance for sustainability. Integrating culture, competences, and digital leadership. If today's digital leaders wish to promote an innovative culture within their organizations, they need have a global perspective, engage with others, and be more innovative.

Furthermore, organisational culture is a collection of essential values that all group members grow to share as they surmount challenges to internal integration and outward adaption. There are aspects of this digital culture that have roots in both online and offline occurrences. Numerous studies have shown that senior executives may strategically influence the culture of their organizations (Sarros 2012). With the backing of digital cultures like artificial intelligence (AI), the internet of things (IoT), big data, and cloud computing, the digitalization of enterprises appears to be a widespread trend in today's technological age. The creation of an innovative culture—a digital culture for the digital age—is a critical but difficult task for top managers (Edquist 2007). A digital leader must devise and carry out the company's strategies, as well as change the existing cultures and promote digital cultures, in order to boost a company's competitiveness.

The authors of a previous study (Erhan and Uzunbacak 2022) claim that digital leaders have an impact on employees' innovative conduct and boost organisational success. In addition, even though digital transformation depends on computers, companies still need to hire staff with computer knowledge to manage these devices. A successful digital leader efficiently translates organisational resources, offering a high level of performance and assisting digital business efforts (De Araujo 2021). Successful digital organizations require strong, developed leadership skills that foresee and drive disruption (Zeike and Bradbury 2019). As a result of their facilitation of the integration of digital capabilities into the growth of organizations' cultures and competencies, these leaders are known as "digital leaders" (Rudito and Sinaga 2017). As a result, digital leaders may inspire their followers to improve their digital literacy, which will encourage employees to act creatively. Leadership is not a requirement for management or having a formal position (Lussier 2015). This study predicts that digital leadership will have an impact on workers by enhancing their digital aptitudes through organizational training and learning. Tech-savvy workers collaborate to enhance performance and create long-lasting companies. This study put up the following set of assumptions in light of the above mentioned context:

H2. *There is significant positive relationship between the digital leadership and digital culture.*

H3. *There is a significant posittve relationship between the digital leadarship and employees' digital capabilities.*

The Mediating Role of the Digital Culture

Prior studies have emphasized the critical role that an organization's digital culture plays in realizing the full potential of digitalization in new endeavors, and leaders have a significant influence on organizational culture (El Sawy 2023). An organization's culture is one of the behaviors that give it its identity (Punnett 2021). Additional characteristics of digital cultures that foster innovation and pave the way for digital goods and services include flat hierarchies and decentralized decision-making. Given the ambiguity surrounding the future of the digital economy, digital leaders may find it difficult to persuade staff to use a certain set of technologies that may or may not be put into use. A digital culture encourages creativity and knowledge growth, which allows for the development of new products and services (Duerr and Holotiuk 2018). Additionally, both the financial and non-financial aspects of the organization are impacted by this. The behavioral changes brought about by technology use in a company depend on how it is employed.

This culture might promote digital processes, place a high value on data, implement agile and flexible working practices, and have adaptable, strong skill sets that permit failure when employing fresh digital talent when launching new enterprises (El Sawy 2023). In order to find evidence of a

connection between open innovation and empowered leadership (Naqshbandi and Tabche 2021) did not employ the organisational learning culture. The link between digital strategy and innovation has been proven to require a strong digital culture (Rudito and Sinaga 2017). Digital leaders must encourage the integration of digital skills into the advancement of organisational cultures and capacities. It may be more challenging for digital literacy (DL) and creative work practices to connect in a digital culture, according to our argument, which is backed by the findings of prior studies. For digitalization to succeed and for communication between internal and external settings, digital culture is essential. Consequently, this study hypothesizes the following:

H4: *Digital culture positively mediates the relationship between the digital leadership and the innovative work behaviors*.

The Mediating Role of Employees' Digital Capabilities

A worker's digital competence, knowledge, and talents are what show them to be capable of employing digital technology (Bassellier 2022). For instance, staff members need to be knowledgeable about the tools necessary to apply big data analytics, which enables them to store, analyze, and simulate a large amount of data (Proksch and Rosin 2021). For example, the findings of this study could be applied to improve or create new digital products, services, or practices, and eventually, creative work practices.

An employee's digital skills include, for example, the ability to actively exchange data and documents across digital platforms like cloud services and the utilization of digital channels, including social media and mobile platforms, to incorporate digital communication protocols (Fischer and Reuber 2015). Digital initiatives and the digitalization of business processes are found to partially mediate employees' IT abilities, according to research at a startup company. The influence of digital leadership on digital processes, materials, and services may be increased through increasing employee digital capabilities. Staff members who are adept with technology can track workflows in real time and make them more evident.

As a result, it is now possible to pinpoint procedures that could benefit from using digital technology to adapt or improve them (Iivari and Ahokangas 2017). Therefore, this study predicts that employee digital skills will affect organisational creativity and digital leadership in the age of digitization. Therefore, in our view, employees' level of digital proficiency can act as a mediator in the relationship between digital leadership and innovative workplace behavior. As a result, this study speculates the following:

H5: *Employees' digital capabilities positively mediate the relationship between digital leadership and innovative work behaviors.*

Methodology

Employees, managers with a digital competence, and a digital culture all support innovative practices in the age of digital technology. For the goal of conducting research, studies need both quantitative (in numbers) and qualitative (in words) data, primarily for improved comprehending and reliable findings. Since data collection is a crucial step in the process, primary data—or first-hand information—is the main focus of research on this topic. Primary data must be gathered for this study. The results of this study may not be reliable if secondary data from any source was used. My study's variables are subjective, so manipulating them requires the use of the appropriate scales. Information can be gathered without the need for experiments or observations. In research,

both quantitative and qualitative methods are usually used to gather data. The quantitative method has been the primary focus of this study in order to produce trustworthy and broadly applicable results. After operationalizing the concepts and scales, this study must create sufficient questioners with pertinent questions that satisfy our requests for further analysis. The results indicate that the majority of respondents are male (53.9%) and females are (46.1). Respondents are working within organization are under 1 year (3.1%), 1 to 2 years (32.5%), 2 years to 3 years (29.8%), 3 years to 4 years (31.9%) and 4 years to 5 years (2.7%).

Sampling Procedure

For the purposes of data collection and analysis in statistics and other fields of mathematics, a population is an identifiable group of people, living things, or objects that can be identified from one another. Using an online survey on Google Forms hosted in Wzirabad and Gujranwala, This study gathered this data from workers in many industries, including sales/marketing, human resource, accounting and finance, manufacturing, service and supply chain. The study sample frame included workforce in above mentioned organizations. Mainly management personals, supervisor and their subordinates. Two types of sampling designs are probability and non-probability. Convenience sampling was the primary non-probability sample strategy used for this investigation. This particular method was chosen because it is among the quickest, most cost-effective, and most practical. Targets are chosen from among members who are easily accessible. Cohen (1969) and Krejcie and Morgan (1970) significantly streamlined the size determination process by providing a table that guarantees a sound decision model. The broad scientific recommendation for choosing a sample size was provided by the table. The study sample size is approximately 340–350 because the population size in the table is 3500–4500.

Measurement of Variables

Digital Leadership: Six questions were used to gauge how employees felt about digital leadership in the sector (Uzunbacak 2021). One item, however—" A digital leader educates the institution's staff about the technical resources that may be utilised to boost engagement with the corporate strategy"—was eliminated from the research owing to extremely low loading. Therefore, six items were employed in this study to measure digital leadership. With reference to digital leadership, this study utilized the following example statement: "A digital leader raises awareness among the organization's employees of the risks associated with information technologies." *Digital Culture:* Five questions from the work, a prior research by Lukas et al., and a digital culture study were used to measure digital culture (Dorian Prokscha 2021). Regarding digital culture, this study utilized the following sample item: "We candidly talk about failures with every one of the team members." Each item was evaluated using a five-point Likert scale (1 = never, 5 = always). *Employees' Digital Capabilities:* Five items from the work, which was initially focused on employee understanding as well as technological competence and used to quantify digital innovation, were used to gauge employees' digital capabilities (Rosin and Pärt 2021). Regarding employee digital capabilities, this study utilized the following sample statement: "We provide various forms of training (courses, literary works, mentoring) to enhance the digital expertise of our staff members." *Innovative Work Behaviors:* The study (Kang and Lee's. 2017) used four items to quantify the IWB. I originate or develop novel ideas, I support others' ideas, I look into and get the resources needed to carry out novel ideas, and I support suitable plans and timelines for the implementation of new ideas. Each item was evaluated using a five-point Likert scale (1 = strongly disagree, 5 = strongly agree).

In this study, the suggested model was examined using SPSS version 23. Confirmatory factor analysis (CFA), data reliability, validity measurement models, convergent validity, and discriminating validity were all taken into account during the analysis. This study employed both exploratory and confirmatory factor analyses to ascertain the validity. After the completion of the questionnaires, the data is processed and analyzed using software. Descriptive statistics, correlation, regression, and mediation analysis are all performed. Data must be coded and modified once they have been collected through surveys. The data must first be categorized before being entered. Actual numbers shown in the questioners can be used to code a specific respondent's response. Data loaded into SPSS database following coding of replies. Data that has been entered must be modified. Information detection and correction are the focus of data editing. The next technique I employed was to substitute a different value for the original numerical representation of the quantitative value. Only after several questions have been utilized to assess a single topic is it completed. In this technique, concepts are measured using 5 items, and scores are determined for each item individually. It entails summing the scores and dividing them by the quantity of factors. Using SPSS, one can determine frequencies, measures of the central tendency, and relationships between variables.

Analysis and Interpretations

Sample characteristics

Gender: There are 295 valid questionnaires included in this study for analysis. Because behaviors and attitudes differ across genders, gender is a demographic factor that cannot be ignored in any study of organisational behavior. The findings show that men (53.9%) and women (46.1%) make up the majority of responders. **Age:** Aid in reducing employee reluctance because women are typically reluctant to share their age in public. Additionally, the data reveals that respondents were divided into five age groups: under 30 (27.1), 24 to 26 (33.6%), 27 to 29 (28.8%), 30 to 32 (5.1%), and above 33 (5.4%).The majority of responders (33.6%) claimed to be between the ages of 24 and 26. **Tenure**: It has been stated in previous research that when an employee first joins an organization, he or she initially has trouble aligning with the organisational value system but eventually learns how their values differ from the organisational value system. Respondents are working within organization are under 1 year (*3.1%*), 1 to 3 years (*32.5%*), 3 years to 5 years (*29.8%*), 5 years to 7 years (*31.9%*) and 7 years to 9 years (*2.7%*). So the majority of respondents (*32.5%*) are attached with organizations for 1 year to 3 years.

Reliability Analysis for scales used

Reliability is the ability of a test item to consistently yield the same result when used repeatedly to determine a scale. Alpha values greater than 0.7 are considered normal and trustworthy. Conversely, it is believed that a value below 0.7 is less accurate in measuring the selected set of constructs. For every scale used in the data, the Cranach alpha values are shown in the designated table 1.

Table 1: Reliability Analysis

Sr.	Variables	Cranach alpha	Items
1	Digital Leadership	0.857	6
2	Digital Culture	0.890	5
3	Employees Digital Capabilities	0.842	5
4	Innovative Work Behavior	0.880	4

Above table show that all variables have higher Cranach alpha values that is suitable and acceptable for analysis in this study.

Correlation Analysis

By employing correlation analysis, we can discover the kind of variation that exists between two variables. By looking at the variation between two variables, one can determine whether or not they fluctuate simultaneously. Pearson correction analysis, which is commonly used to investigate the relationship between two values, is used to compute the correlation coefficient. On the other hand, strong/high correlation values can be as high as 1.0 to 0.5 or -1.0 to -0.5. Moderate correlation is defined as falling between -0.5 and -0.3 or between 0.3 and 0.5. And a weak or poor correlation is indicated by a figure that is between 0.1 and 0.3 or between -0.3 and -0.1. When the association value is zero, there is no correlation between the variables.

Table 1: Correlation Analysis

	D.L	**D.C**	**E.D.C**	**I.W.B**
D.L Pearson Correlation	1			
D.C Pearson Correlation	.778**	1		
E.D.C Pearson Correlation	.584**	.632**	1	
I.W.B Pearson Correlation	.620**	.676**	.726**	1

**. Correlation is significant at the 0.01 level (2-tailed).

The correlation values show the strength and kind of the relationship between the variables. This study learned from output table 3 that there is a strong and favorable correlation (r= 0.778 and p 0.01) between digital leadership and culture. The correlation between digital leadership and employees' digital abilities is significant at r = 0.784 and p 0.01 and is both strong and positive. Additionally, there is a significant and positive association between digital leadership and innovative work behaviors where r = 0.620 and p 0.01 are observed. Innovative work behaviors are highly and significantly linked with digital culture (r=0.676, p 0.01), and employees' digital capabilities are strongly and substantially related to it (r=0.632, p 0.01). Employees' digital aptitudes are significantly and favorably correlated with innovative work practices (r=0.726, p 0.01). The results demonstrate a positive link between the dependent variable (innovative work behaviors), mediator (digital culture and workers' digital abilities), and independent variable (digital leadership).

Regression Analysis

Information regarding the causal relationships between the variables is obtained through regression analysis. Regression analysis was used to determine the cause and effect relationship's result. It shows how much of the variance of the dependent variable can be accounted for by the independent variable and how much of the change in the dependent variable results from a one-unit change in the independent variable. The relationship between innovative behaviors, employee digital skills, and digital leadership was investigated using a mediation regression analysis.

Digital leadership and innovative work behavior

R-square in our study explains that the independent variable is the cause of all variance in the dependent variable.

Table 3: R Square

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.620[a]	.384	.382	.74212

As indicated in table 3 result can see that R-square value is 0.384 which means that digital leadership causes 38.4% change in innovative work behaviors.

Digital leadership, the Digital culture and the Employees Digital Capabilities

Table 4:

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.778[a]	.606	.604	.59387
2	.787[b]	.620	.617	.58411

a. Predictors, (Constant), D.C
b. Predictors, (Constant), D.C, E.D.C

Above table- 4 indicated that for model 1 can see that R-square value is 0.606 which means that our independent variable (digital culture) causes 60.6% change in dependent variable (digital leadership). In model 2 can see that R-square value is 0.620 which means employees digital capabilities causes 62% change in digital leadership. Above table show that in model 1 and 2 indicated that Beta values are positive which indicate the positive relationships between digital leadership – digital culture and digital leadership – employee's digital capabilities as purposed in hypothesis 2 and 3.

Mediation Analysis

Hypothesis: 4

To assess hypothesis 4, this study must perform the mediation analysis. Digital culture favorably mediates innovative behaviors and digital leadership. The findings indicate that there are differences in digital culture as a result of digital leadership, with an R-square of 60.57%. According to research, there is a 61.16% variation in innovative work behaviors as a result of digital leadership. The significance of these relationships is demonstrated by the P-value being less than 0.05.

Table 5: Total effect of X on Y

Effect	se	t	p	LLCI	ULCI
.7164	.0530	13.5243	.0000	.6121	.8206

The overall impact illustrates how innovative work practices are impacted by digital leadership. Table 5 shows that the overall impact of digital leadership on innovative behaviors is 0.7164, with a significant p value of 0.000. According to the study, 71% of employees' creative work practices change as a result of digital leadership. With 95% confidence, zero is absent in the interim, and the bootstrap's lower and upper bounds are 0.6121 and 0.8206, respectively.

Table 6: Direct effect of X on Y

Effect	SE	t	p	LLCI	ULCI
.2745	.0777	3.5331	.0005	.1216	.4274

The direct effect results for the influence of digital leadership on creative work practices are displayed in Table 6, along with the role of digital culture as a mediating factor. Consequently, this investigation found that the mediation result was 27% with a significant p-value (p = 0.000). Lastly, this study compiles the data and reveals that there is a 38% variation in innovative work behavior when digital culture is present.

Table 7: Indirect effect(s) of X on Y:

	Effect	BootSE	BootLLCI	BootULCI
D.C	.4419	.0659	.3059	.5670

Table 7's indirect impact demonstrates that there is mediation, meaning that digital culture acts as a mediator in the relationship between innovative behaviors and digital leadership. The bootstrap values can predict statistically significant results because the lower and upper limits are 0.3059 and 0.5670, respectively. Consequently, this hypothesis is accepted since the data supports the H4.

Hypothesis: 5

To assess hypothesis 5, this study must perform the mediation analysis. The skills of digital workers play a positive mediating role in the relationship between innovative behaviors and digital leadership. According to the results, there are differences in digital culture due to digital leadership, as indicated by the R-square value of 34.14%. Research indicates that 58.51% of the variation in innovation behaviors can be attributed to digital leadership. The significance of these correlations is demonstrated by the P-value being less than 0.05.

Table 8: Total effect of X on Y

Effect	se	t	p	LLCI	ULCI
.7164	.0530	13.5243	.0000	.6121	.8206

Table 8 shows the overall impact of digital leadership on creative work practices. The overall impact of digital leadership on innovative behaviors is 0.7164, with a significant p value of 0.000. According to the study, 71% of employees' creative work practices change as a result of digital leadership. With 95% confidence, zero is absent in the interim, and the bootstrap's lower and upper bounds are 0.6121 and 0.8206, respectively.

Table 9: Direct effect of X on Y

Effect	se	t	p	LLCI	ULCI
.3436	.0537	6.4020	.0000	.2380	.4492

The impact of digital leadership on creative work practices and the part that employees' digital skills play in reducing this effect are both shown in Table 9's direct effect result. As a

consequence, we found that the mediation result was 0.3436 with a significant p-value of 0.000. Lastly, we compile the information and reveal that 34.36% of employees' creative work practices changed when they had access to digital tools.

Table 10: Indirect effect(s) of X on Y:

	Effect	BootSE	BootLLCI	BootULCI
E.D.C	.3728	.0435	.2895	.4603

The indirect effect demonstrates the existence of mediation; in this instance, employees' digital capabilities act as a mediator between innovative behaviors and digital leadership. The bootstrap values can predict the significant results because the lower and upper limits are 0.2895 and 0.4603, respectively. Since the data supports the H5, this hypothesis is thus accepted.

Discussion and Conclusion

The primary goal of the current study is to examine the relationship between digital leadership and good employee attitudes, as innovative behaviors, by putting a special emphasis on digital culture and employee digital capabilities. Given that performed this research in the context of Pakistan, the findings raise a number of unresolved issues. The study's findings point to some unique literary contributions. To achieve the objectives of our study, this study carried out the aforementioned analysis. Leadership influences employee behavior, as is well recognised. Therefore, this study examined the direct influence of digital leadership on innovative work practices. The result showed that the beta value was 0.620, meaning that a change in I.V. of one unit would result in a change in D.V. of 0.620 units. Additionally, the Beta value is positive, indicating the hypothesis 1's intended association between digital leadership and innovative work behavior. As it can see in the model, the R-square value is 0.606, indicating that the dependent variable (digital leadership), which is affected by our independent variable (digital culture), has changed by 60.6%. The R-square value for model 2 is 0.620, which indicates that employee digital capabilities are responsible for 62% of the change in digital leadership. Given that the p-value for model 1 is 0.000, which is less than 0.05, this study may infer that there is a substantial relationship between digital leadership and digital culture.

In model 2, the P-value is less than 0.000, indicating an important relationship between employee's digital capabilities and digital leadership. The table above demonstrates that, as planned in hypotheses 2 and 3, Beta values in models 1 and 2 imply positive correlations between digital leadership, digital culture, & employee's digital capabilities. Digital leadership and innovative behaviors are favourably mediated by digital culture. Results show that R-square is 60.57%, which tells us that there are differences in digital culture because of digital leadership. Due to digital leadership, research has discovered that there is a 61.16% variance in innovative work behaviors. P-value is less than 0.05, demonstrating the significance of these correlations. The link between digital leadership and innovative behaviors is mediated by digital culture, as shown by the indirect impact, which also shows the presence of mediation. Due to the fact that the lower and higher limits are each.3059 and.5670, the bootstrap values are able to forecast results that are statistically significant. As a consequence, the H4 is supported by the data, and this hypothesis is accepted. Employees' digital capabilities serve as a constructive mediator in the link between innovative behaviors and digital leadership. This study must carry out the mediation analysis in order to evaluate hypothesis 5. Digital capabilities of employees provide a helpful mediating function in the relationship between digital leadership and innovative behaviors. The R-square value of the results, which is 34.14%, suggests that there are variances in digital culture due to digital

leadership. According to research, a 58.51% difference in innovative behaviors may be attributed to digital leadership. P-value is less than 0.05, demonstrating the significance of these correlations. The indirect impact shows that mediation exists; in this case, the link between digital leadership and innovative practices is mediated by employees' digital capabilities. Given that the lower and higher limits are individually.2895 and.4603, the bootstrap values are able to anticipate the findings that are significant. Therefore, this hypothesis is accepted since the data support the H5.

Implications

Practical Implications

In the age of digital technology, adopting a new technology is a challenging job, but digital leaders may facilitate organisational survival. The results of this study may help us comprehend the connection between digital leadership and creative work practices among Pakistani employees. Since digital leaders have knowledge of organisational culture and dynamic abilities to ensure innovative behaviors, they have the capacity to influence employee's digital capabilities and culture. Employees are empowered to use innovative work behaviors in organizations with strong digital cultures, and these cultures can mediate the relationship between innovative work behaviors and digital leadership. Allocating resources to maintain company in the future requires digital leadership at its foundation (Mihardjo and Furinto 2018). Digitally skilled managers encourage their employees to use innovative methods, which increases motivation and productivity. Additionally, in order to persuade their employees to adopt modern trends, their leadership style must be flexible enough to accommodate new technologies (Erhan and Uzunbacak 2022). The study's findings shed light on the significance of digital leadership for workers' innovative work behaviors in a nation with a developed digital economy like Pakistan. Implementing digital leadership encourages workers' innovative work behaviors by supporting their digital capabilities and digital cultures.

Theoretical Implications

This research has some significant theoretical implications; (Erhan and Uzunbacak 2022) a suggestion that future empirical testing may employ digital leadership as a core variable to identify other matching factors. This work makes theoretical contributions to the theories of resource-based perspective and leadership behaviors. Digital leadership is the primary variable in this study, while innovative behaviors are the dependent variable. However, the outcome shows a considerable impact on innovative work behaviors. This research contributes to the body of empirical literature by looking at industry. Digital leadership practices encourage the development of a digital culture and digital capabilities among workers. The results of this study suggest that, in this context, the link between digital leadership and innovative behaviors is partially mediated by the digital culture and the employees' digital capabilities.

Research Limitations and future directions

This research has several limitations, same as previous studies. First of all, because this study only looked at the manufacturing, human resources, and service sectors, the results cannot be generalized. This study cannot, therefore, be generalized to other firms; instead, future research may focus on a niche market, like the information technology sector. Future research may examine our strategy in different cross-cultural settings. Second, this study examined data from 295 respondents, enabling next researchers to obtain more data. Additionally, this study looked for a connection between digital leadership and innovative behaviors using two mediating factors.

Future scholars can make advantage of several variables, including digital business structures and strategy. The last dependent variable this study looked at was innovative work behaviors. But there are numerous factors that affect digital leadership. Future studies will thus need to identify novel factors that are impacted by digital leadership.

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