

# The Influence of Digital Culture and Digital Leadership on Innovative Work Behavior

Bülent Çetinkaya<sup>1</sup>, Lütfi Sürücü<sup>2</sup>

<sup>1</sup>Faculty of Business, European Leadership University, Gazimagusa, Mersin 10, Turkey

<sup>2</sup>Department of Business Administration, World Peace University, Lefkosa, Mersin 10, Turkey

Correspondence: Bülent Çetinkaya, Faculty of Business, European Leadership University, Gazimagusa, Mersin 10, Turkey.

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## Abstract

Organizations are focusing on becoming more sustainable, particularly in this era of digital transformation. Leadership and managerial abilities significantly impact organizational success. Organizational strategies and procedures are evolving due to recent advancements in digital technology and the spread of digital transformation. A digital leader is a person who recognizes the potential of digital tools and trends, uses them to drive innovation and efficiency, and promotes a culture of ongoing learning and adaptation. The hypotheses investigated in this research are that: H1: Digital leadership has a positive effect on innovative work behavior. H2: Digital organizational culture plays a mediating role in the relationship between digital leadership and innovative work behavior. The sample of the research consisted of employees of companies operating in the fields of IT and technology in Istanbul. The research data collection process was completed with data from 404 questionnaires. The research data were analysed using AMOS 22 and SPSS 27 programs. Descriptive statistical analyses were performed to determine the demographic structure of the participants. The validity and reliability of the scales were firstly tested, the findings of which confirmed that the scales have convergent validity. The findings of this study shed light on the intricate relationship between digital culture, digital leadership, and innovative work behavior, offering valuable insights for both scholars and practitioners in the field of organizational behavior and management. Another significant finding is the positive impact of digital leadership and digital culture on innovative work behavior within organizations.

**Keywords:** digital culture, digital leadership, digital organizational culture, innovative work behavior

## 1. Introduction

Several key elements could be included in a model that analyses the connections between digital culture, digital leadership and innovative work behavior. Organizations are focusing on increasing their sustainability, particularly in the current era of digital transformation. Leadership and managerial abilities significantly impact organizational success. Organizational strategies and procedures are evolving due to recent advancements in digital technology and the spread of digital transformation. In this context, leadership is specifically evolving towards digital leadership. Research has shown that a causal relationship exists between digital culture and digital leadership, which both influence innovative work behavior. Shin, Mollah and Choi (2023) found that as a result of these shifts, organizations are being driven to modernize their resources in order to gain a competitive edge. A new wave of the economic and industrial revolution is emerging driven by the advent of new digital technologies, particularly artificial intelligence, blockchain technology, cloud computing, Big data, edge computing, and 5G. This revolution is also fundamentally changing organizational management. The digital transformation promotion includes efforts to harmonize organizational culture, people, structure, and tasks and goes beyond merely installing more and better technology in a rapidly evolving digital environment. For example, it was predicted that by 2022, 47% of organizations would be technologically advanced, 20% would use digital leadership, and 53% would transition from traditional systems to public cloud-based ones. However, significant progress must still be made before many organizations completely embrace digital transformation.

Leaders play an important role in any organization because they are responsible for choosing, providing for, and influencing one or more followers. Additionally, followers who respect and feel a connection with their leaders are more motivated and prepared to work enthusiastically compared with leaders who force compliance (Erhan et al., 2022).

Different leadership styles, starting with the traditional one that is centered on controlling, competitive, and aggressive concepts, are brought out by the always-changing period. Digital culture and digital leadership can have a significant impact on prompting and shaping innovative work behavior within organizations. Erhan et al. (2022) consider the digital culture to be the common ideas, values, conventions, behaviors and practices that influence how people engage with digital platforms and technology. It includes how people and organizations use digital technologies, interact online, and adjust to the rapid changes brought about by technology. A positive digital culture promotes teamwork, candid communication, adaptability, and a willingness to engage with new technology. Additionally, it places a focus on using data to inform decisions, awareness of cybersecurity risks, and the responsible use of digital resources. However, a robust digital culture is often linked to strong organizational performance, which in turn develops digital literacy, embraces technology, and fosters open dialogue, accountability and adaptation. A digital culture entails frequently being open to experimenting with novel techniques and methods as well as an understanding of the ethical considerations surrounding digital interactions. Additionally, Adie et al. (2022) emphasized that by fostering an atmosphere that values experimentation, stimulates open collaboration, supports continuous learning, and gives employees the freedom to think creatively, both digital culture and digital leadership could greatly impact innovative work behavior. Therefore, organizations are more likely to witness a favorable influence on their capacity to innovate and adapt in a constantly shifting digital environment when these components are successfully integrated.

In our review of the literature, we attempt to identify previous studies that support our two hypotheses, which are: H1: Digital leadership has a positive effect on innovative work behavior. H2: Digital organizational culture plays a mediating role in the relationship between digital leadership and innovative work behavior.

## 2. Literature Review

### *The concept of Innovative Work Behavior*

According to Siregar et al. (2019), innovative work behavior refers to the proactive creation, development, and use of unique ideas, processes, products, or solutions within a work setting. It entails the use of original thought processes, seeking out new opportunities, and taking calculated risks to enhance work procedures or results. For organizations to remain competitive and adjust to changing market conditions, innovative work behavior is crucial. It frequently thrives in a setting that embraces diversity, values experimentation, and offers staff members the tools and support they need to develop and implement their innovative ideas. AlEissa and Durugbo (2022) asserted that innovative work behaviour constitutes the ability and willingness of employees to engage in original thought, idea production, and problem-solving in order to promote innovation within their organization. In today's rapidly evolving business environment, organizations must continuously adapt and innovate to remain competitive. These ideas are related because effective digital leadership is critical to forming and fostering both a team or organization's digital culture and its innovative capabilities. A strong digital culture can foster an environment that promotes and supports innovative work behavior.

In the context of digital culture and leadership, fostering experimentation with digital tools, rewarding creative thinking, and supporting the implementation of digital solutions that enhance efficiency, customer experiences, and overall business performance can greatly facilitate innovative work behavior. As they set the tone for accepting technological changes and fostering creativity throughout an organization, digital leaders play a key role in promoting and modeling such behavior (Al-Omari et al., 2019).

### *How Digital Leadership Shapes Innovative Work Behavior*

An environment that fosters experimentation with digital tools, rewards creative thinking, and supports the implementation of digital solutions that improve efficiency, customer experiences, and overall organizational performance can greatly facilitate innovative work behavior in the context of digital culture and leadership. As they set the tone for adopting technology and stimulating creativity throughout the organization, digital leaders play a critical role in promoting and modeling such behavior (Wokurka et al., 2017). According to Erhan et al. (2022), digital leadership entails directing and motivating teams or organizations amidst the rapidly evolving landscape of digital technologies. As such, a leader plays a crucial role in an organization because they are responsible for choosing, preparing, training, and influencing one or more followers.

Furthermore, a leader in the digital age is someone who appreciates the potential of digital tools and trends, successfully exploits them to promote innovation and efficiency, and cultivates a culture of ongoing learning and adaptation. In order to effectively navigate the digital world and guide their teams through digital transformations, digital leaders need to be more than simply technological specialists; they also need to have strong interpersonal and strategic abilities (Schröder, 2021). In the context of rapidly evolving digital technologies, digital leadership entails directing and motivating teams or organizations. Therefore, a digital leader is a person who recognizes the potential of digital tools and trends, uses them to drive innovation and efficiency, and promotes a culture of ongoing learning and adaptation. In addition to being technological specialists, digital leaders require strong strategic and interpersonal abilities to understand the digital

world and guide their teams through digital changes. As Quaquebeke and Gerpott (2023) observed, it is crucial to investigate how digital leadership and culture are related. However, the need to manage teams remotely presents new challenges for managers. For instance, in such circumstances, it can be relatively difficult to collaborate physically with workers. This research specifically examines how digital culture influences creative work behavior. From the perspective of digital leadership, it emphasizes and demonstrates the importance of digital culture, while also examining the degree to which organizational digital maturity and digitalization affect leadership. The leadership style of leaders and managers at various levels of an organization's hierarchy can have an impact on digital maturity, which is clearly measurable and recognized within that organization. Managers and leaders at different hierarchical levels can thrive in digital working environments courtesy of digital leadership. A shared knowledge of values will be necessary in order to create an organizational culture that is founded on values (Aydin et al., 2022).

In this context, it is necessary to understand how digitalization affects organizational leadership practices and staff behaviors. Recent studies have examined how digital leadership shapes innovative behavior, generating interesting findings that advance the knowledge of digitalization, the digitalization of labor, and digital leadership. For instance, the studies by Rahman and Aydin (2020) emphasized the importance of leadership in human resources management processes by highlighting the impact of the Covid-19 pandemic on employee well-being. Additionally, the literature demonstrates how digital platforms are used in e-recruitment procedures as well as how management studies are shifting from traditional to digital leadership (Erhan et al., 2022). Therefore, digital leadership is essential for advancing an organization's successful transformation.

*Hypothesis 1: Digital leadership has a positive effect on innovative work behavior.*

#### ***Mediating Factors Between Digital Culture, Digital Leadership and Innovative Work Behavior***

In the digital age, digital leadership entails directing and motivating teams. An individual who successfully negotiates the complexity of technology and leverages it to promote innovation, growth, and organizational transformation is referred to as a "digital leader." Digital leaders are flexible, open to change, and adept at using digital tools to improve customer or client experiences, streamline operations, and promote a culture of lifelong learning. They frequently place a strong emphasis on teamwork, data-driven insights, and the advancement of digital competencies within their teams (Alheet et al., 2021).

In the rapidly evolving digital landscape, the role of digital leadership has become paramount for organizations seeking to thrive. Digital leadership is not merely about adopting new technologies; it encompasses directing and motivating teams to harness these technologies effectively. Digital leaders are defined as individuals capable of navigating the complexities of technology to foster innovation, growth, and significant organizational change (Alheet et al., 2021). They are characterized by their adaptability, openness to change, and proficiency in utilizing digital tools to enhance customer experiences, streamline operations, and cultivate a culture of continuous learning.

An organization's ability to convert innovative ideas into practical results is measured by its innovative work behavior. For example, it is likely that an organization with a high innovation performance has created a culture that values experimentation, creativity, and the adoption of fresh ideas. This may result in improved services, greater operational effectiveness, and a more powerful position in the market. In the context of contemporary organizations, the three concepts of digital culture, digital leadership and innovative work behavior are connected. Employees who have a high level of creative self-efficacy are more likely to provide unique ideas since they have an increased likelihood of believing in their own creative talents. Digital leadership is essential for promoting an innovative culture, utilizing digital tools and technology, and promoting the adoption of novel ideas. The interaction between creative self-efficacy, digital leadership, and innovation performance could ultimately result in businesses being more prepared to succeed in the fast-paced, technologically advanced modern business environment. Organizations may benefit from understanding the connections between digital culture, digital leadership, and innovative work behavior. This could inform training initiatives, leadership development programs, and strategies for promoting an innovative culture in the digital era (Muchiri et al., 2020).

Considering that the research model could be more intricate and subtle than this simplified overview, investigating the relationships and interactions between these three concepts would pave the way for understanding the influence of digital culture in today's business environment. To demonstrate the interplay of leadership styles, innovative work behavior and organizational culture, Khan et al. (2020) noted that the following assumptions describe how the model functions:

1. A digital culture positively promotes digital leadership. Leaders who have confidence in their creative abilities are more likely to use digital leadership techniques to encourage creativity and innovation among their employees.

2. The effective use of digital technologies and methods by leaders can help foster an environment that is conducive to innovation, which in turn improves the performance of innovation within an organization.
3. Digital culture and digital leadership both have a favorable impact on innovative work behavior: Individuals who have greater levels of creative innovation are more likely to contribute original ideas and advance innovative work behavior within organizations.
4. Digital leadership plays a crucial role in mediating the relationship between digital culture and innovative work behavior. Digital leadership may serve as a link between a person's creative self-efficacy and an organization's innovation performance.

Moreover, Akram et al., (2020) proposed that the relationships in the model could further be influenced by these mediating factors. The influence of digital culture on both digital leadership behaviors and innovative work behavior, for instance, may be moderated by aspects of organizational culture, technology infrastructure, and team dynamics. Accordingly, researchers can gather information through surveys, interviews, and potentially organizational observations to test the efficiency of this model. The strength and importance of the correlations suggested in the model could be measured statistically using approaches like regression analysis or structural equation modeling.

The integration of these concepts emphasizes the complex interrelationships between digital leadership, digital culture, and innovative work behavior. Employers who foster a digital culture among their staff are more likely to have a workforce that is receptive to utilizing new technologies and methods of operation. Digital leaders who foster a culture of trust and welcome experimentation can increase workers' confidence in their own creative abilities. Consequently, employees who are confident in their creative abilities are more likely to contribute novel ideas and participate in innovative projects, which in turn can have a positive effect on innovative work behavior. In today's digitally driven environment, it is crucial that a holistic approach is adopted that takes into account organizational dynamics, leadership styles, and individual self-efficacy in order to develop an innovative culture and achieve exceptional innovation performance (Khan et al., 2020).

Digital leadership is a critical component of organizational success in the digital age. By understanding and leveraging the mediating factors that influence the relationship between digital culture, digital leadership, and innovative work behavior, organizations can cultivate a robust environment that promotes creativity and growth. As the digital landscape continues to evolve, nurturing these elements will be essential for a sustained competitive advantage. Organizations that prioritize these mediating factors are likely to see enhanced performance, stronger employee engagement, and a culture that embraces innovation as a core value.

*Hypothesis 2: Digital organizational culture plays a mediating role in the relationship between digital leadership and innovative work behavior*

### ***Influence of Digital Organizational Culture on Digital Leadership and Innovative Work Behavior***

In today's rapidly evolving digital landscape, the interplay between organizational culture and leadership has become increasingly significant. The digital organizational culture embodies the values, beliefs, and practices that shape how digital technologies are integrated into the workplace. This culture not only influences leadership styles but also impacts employees' innovative behaviors. Understanding these relationships is crucial for fostering an environment that promotes creativity and adaptability. The digital organizational culture in an organization refers to the extent to which it embraces digital technology, agility, and innovation. Key characteristics of a strong digital organizational culture include: Openness to Change: An organization that encourages flexibility and the adoption of new technologies; Collaboration: Emphasis on teamwork and communication across digital platforms; Continuous Learning: Promotion of ongoing education and skill development to keep pace with technological advancements.

Employee Empowerment: Granting employees the autonomy to explore and implement innovative solutions.

Digital leadership encompasses the guiding principles and practices of leaders in a digital context. Effective digital leaders inspire their teams to leverage technology and drive innovation, exhibiting the following traits: Visionary Thinking: Ability to foresee digital trends and align organizational goals accordingly; Adaptability: Skilled in adjusting leadership approaches in response to technological changes and market demands; Emotional Intelligence: Understanding and managing emotions to foster a positive work environment and motivate employees. Innovative work behavior refers to the proactive efforts employees make to develop and implement new ideas, processes, or products. This behavior is influenced by several factors, including a supportive environment, leadership support, recognition and reward, interconnections between digital organizational culture, digital leadership, and innovative work behavior.

The relationship between digital organizational culture, digital leadership, and innovative work behavior is cyclical and multifaceted: culture shapes leadership, leadership transforms culture, innovation accelerated.

The interplay between digital organizational culture, digital leadership, and innovative work behavior is crucial for organizations aiming to thrive in the digital age. By fostering a supportive culture and adopting effective leadership styles, organizations can empower their employees to innovate and adapt, ultimately driving success in an increasingly competitive environment. Therefore, future research should explore empirical models that quantify these relationships and identify best practices for organizations seeking to enhance their digital capabilities.

The research model created in line with the literature presented above is presented in Figure 1.

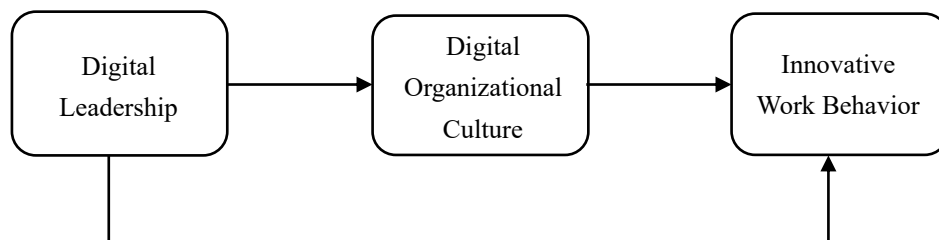


Figure 1. The research model

### 3. Method

#### *Procedure and Sampling*

The sample of the research consisted of employees of companies operating in the fields of IT. Firstly, the managers of the relevant companies were interviewed and informed about the purpose of the research. After receiving this information, permission was requested to administer the questionnaire to the employees. Employees of the companies from which permission had been obtained were then asked to complete the questionnaire. As part of the questionnaire administration process, short information was given to the participants and written consent was obtained. In order to reduce the anxiety of the employees, they were given assurances that data confidentiality would be protected in the research and the questionnaires were delivered in sealed envelopes.

A total of 600 questionnaires were prepared for the research, 540 of which were distributed to the participants. Of the distributed questionnaires, 437 were returned (return rate: 81%). The obtained questionnaires were analysed by the researchers and 33 questionnaires with excessive missing data or that had been incorrectly completed were excluded. The research data collection process was therefore completed with data from 404 questionnaires. In terms of gender, 162 of the participants were female and 242 were male. While 189 of these participants were married, 215 participants were single. 144 participants were 26 years old or younger, 136 participants were between 27-35 years old, 89 were between 36-45 years old, and 35 were 46 years old or older. With regard to education level, 29 participants had an associate's degree, 221 had a bachelor's degree and 154 had a postgraduate degree. 201 participants had 5 years of work experience or less, 129 had 6-10 years of work experience and 74 had 15 years or more of work experience.

#### *Data Collection Tool*

The research data were obtained through closed-ended questionnaires. The scales used in the questionnaires are scales that have been used in previous researches and their validity/reliability has been proven. Detailed information about the scales is presented below.

*Digital Leadership:* The scale developed by Zeike et al. (2019) was used to determine the participants' perceptions of digital leadership towards their managers. Consisting of 6 items, the statements in the scale are graded from 1 to 5. Sample items of the scale are "My manager has a clear idea of the structures and processes that are needed for the digital transformation" and "My manager can make others enthusiastic about the digital transformation".

*Digital Organizational Culture:* The scale used in the research of Zhen et al. (2021) was used to measure digital organizational culture. The statements in the scale consist of 4 items that are graded from 1 to 5. Sample items of the scale are "There is a clear orientation to digital technology changes in the organization's culture" and "The teams collaborate functionally in initiatives targeted at innovation and digital transformation".

*Innovative Work Behaviour:* The scale developed by Janssen (2000) was used to measure the innovative work behaviour of the participants. Consisting of 9 items, the statements in the scale are graded from 1 to 5. Sample items of the scale are "Creating new ideas for difficult issues", and "Seeking out new working methods, techniques, or instruments".

*Control Variables:* Recent studies indicate that innovative work behaviour can also be affected by demographic variables such as gender, working position and tenure, so these demographic variables should be controlled in the analyses (Sürücü et al., 2023; Mustafa et al., 2022). In line with this suggestion, gender, working position and tenure were taken under control in the study.

### Common Method Bias

In order to minimize common method bias in the research, the questionnaire was prepared in accordance with the recommendations of Podsakoff et al. (2003). Accordingly, the introduction page of the questionnaire included information indicating that participation was voluntary, the confidentiality of the information would be protected (participants were asked not to write their names on the questionnaire), and that there were no right or wrong answers to the items in the questionnaire. In addition, the questionnaires were delivered in sealed envelopes and the participants also returned them in sealed envelopes to ensure that they were comfortable when writing answers. Despite all these efforts of the researchers, the collected data were subjected to Harman's (1960) single-factor test to test whether there was any common method bias problem in the research. In the factor analysis conducted by reducing all constructs to a single factor, the first factor explained 38.4% of the data. This value is well below the acceptable lower threshold value of 50%, thus showing that there is no dominant factor. The findings obtained show that there is no common method bias problem in this study (Kline, 2016).

### Data Analysis

The research data were analysed using AMOS 22 and SPSS 27 programs. Descriptive statistical analyses were performed to determine the demographic structure of the participants. SPSS is used for data analysis and preprocessing, while AMOS helps in conducting SEM analyses and visually creating the model. SEM is used for testing complex theoretical models, examining latent variables, and understanding multivariable relationships. It is widely used in research to provide a deeper understanding of complex data structures. Subsequently, the validity and reliability of the scales used in the research were determined and then correlation analysis was performed to determine the relationship between the variables. Finally, analyses were conducted with Process Macro developed by Hayes (2018) to test the research hypotheses.

## 4. Results

### Validity and Reliability

In the model testing stage, the validity and reliability of the scales were firstly analysed. For this purpose, internal consistency reliability, discriminant validity and convergent validity were analysed.

Internal consistency reliability, composite reliability and McDonald's Omega coefficient values were taken into consideration to test the reliability. The findings obtained as a result of the analysis are presented in Table 1.

Table 1. Validity and Reliability

Variables	Factor Load	$\alpha$	Cr	$\omega$	AVE
<b>Digital Leadership</b>		0.870	0.871	0.875	0.532
DL1	0.588				
DL2	0.777				
DL3	0.751				
DL4	0.745				
DL5	0.768				
DL6	0.733				
<b>Digital Organisational Culture</b>		0.879	0.891	0.881	0.673
DOC1	0.876				
DOC2	0.891				
DOC3	0.758				
DOC4	0.746				
<b>Innovative Work Behaviour</b>		0.883	0.899	0.887	0.502
IWB1	0.681				
IWB2	0.593				
IWB3	0.692				
IWB4	0.745				
IWB5	0.714				
IWB6	0.658				
IWB7	0.789				
IWB8	0.788				
IWB9	0.692				

$\alpha$ : Cronbach's Alpha, Cr: Composite Reliability;  $\omega$ : McDonald's Omega Coefficient,

AVE: Mean Variance Extracted.

When Table 1 is analysed, it can be seen that the factor loadings are above 0.5 and the items have the ability to represent the relevant factor well. In addition, the AVE values are also 0.5 and above. Factor loadings and AVE values higher than

0.50 indicate that the scales have convergent validity (Fornell and Larcker, 1981). Hair et al. (2009) emphasised that for convergent validity, the composite reliability value (CR) should be greater than the AVE value, the CR value should be greater than 0.7 and the AVE value should be greater than 0.5. The findings in Table 1 show that these conditions are fulfilled, thus confirming that the scales have convergent validity.

Internal consistency reliability, composite reliability and McDonald's Omega coefficient values were taken into consideration in testing the reliability. According to the literature, scales can be considered reliable if the Cronbach's alpha, CR and McDonald's Omega coefficient values are 0.7 and above (Sürücü and Maslakçı, 2020; Sürücü et al., 2023). The findings in Table 2 show that the Cronbach's alpha values are 0.870, 0.879 and 0.883, respectively, indicating that the scales are internally consistent. The CR values are 0.871, 0.891 and 0.899, respectively, and the McDonald's Omega coefficients are 0.875, 0.881 and 0.887, respectively. These findings indicate that the scales are reliable.

Hair et al. (2009) recommended that discriminant validity should also be checked after ensuring the reliability and convergent validity of the scales. Taking this recommendation into consideration, the discriminant validity of the scales was checked. The Fornell-Larcker criterion was considered when checking the discriminant validity. The results obtained are shown in Table 2.

Table 2. Correlation Analysis

Variables	Mean	Sd.	1.	2.	3.
Digital Leadership	3.17	0.845	0.729 <sup>a</sup>		
Digital Organisation Culture	3.56	0.749	0.452**	0.820 <sup>a</sup>	
Innovative Work Behaviour	3.55	0.682	0.348**	0.321**	0.709 <sup>a</sup>
Kurtosis			0.958	-1.008	-0.627
Skewness			0.347	0.421	0.586

a: These are the square root values of AVE.

Fornell and Larcker (1981) stated that the  $\sqrt{AVE}$  value should be greater than the square of the correlation between variables for discriminant validity. Analysis of the results in Table reveals that this condition is also met, so the scales have discriminant validity (Wong, 2013). Finally, the structural validity of the research model was tested by checking the fit indices. For this purpose, the goodness of fit indices of the measurement model were checked in the confirmatory factor analysis. The literature states that the model has good fit indices if the  $\chi^2/df$  value is 3, the RMSEA value is 0.05 and the CFI, GFI and TLI values are above 0.9 (Byrne, 2010; Kline, 2015). The results of the confirmatory factor analysis show that the model has good fit indices ( $\chi^2/df= 2.897$ , CFI=0.954, GFI=0.948, TLI= 0.961, RMSEA=0.047) and is structurally valid.

Table 2 also shows the results of the correlation analyses conducted to determine the direction and strength of the relationship between the variables. In order to determine which coefficient should be considered in the correlation analysis, the distribution of the data was first checked. Kurtosis and Skewness values were taken into consideration in determining the data distribution. The literature states that if these values are between -1.5 and +1.5, the data are normally distributed (Tabachnick et al., 2007). The findings in Table 2 show that these values are between those recommended in the literature, so the data are normally distributed. Due to the normal distribution of the data, Pearson coefficients were taken into consideration in the correlation analysis.

The findings in Table 2 show that digital leadership has a positive and significant relationship with digital organisational culture ( $r=0.452$ ,  $p<0.05$ ) and innovative work behaviour  $r=0.348$ ,  $p<0.05$ ). In addition, the relationship between digital organisational culture and innovative work behaviour is also significant and positive ( $r=0.321$ ,  $p<0.05$ ).

### Hypothesis Tests

Process Macro is a widely used tool for conducting mediation, moderation, and conditional process analysis in statistical research. It was developed by Andrew F. Hayes, and the 2018 version introduced several improvements and updates to enhance its capabilities. The research investigated the influence of digital culture and digital leadership on innovative work behavior within organizations. The reason why Hayes' Process Macro was used in the current study is that it allows mediation models to be tested, which helps determine if the relationship between an independent variable (digital culture) and a dependent variable (digital leadership) is explained by an intervening variable (innovative work behaviour). It is beneficial when it is hypothesized that the effect of one variable on another occurs through a third variable.

The tool also supports moderation analysis, which examines whether the relationship between digital culture and digital leadership changes depending on the level of a moderator variable (innovative work behaviour). For example, if it is hypothesized that the impact of an independent variable on a dependent variable might vary based on different levels of a third variable, Process Macro would be used to test this.

The most advanced feature of Process Macro is its ability to conduct conditional process analysis, which allows both mediation and moderation effects to be tested in the model.

Hayes' Process Macro (2018) is a versatile and widely used tool that was employed in this research for testing hypotheses related to mediation, moderation, and more intricate relationships between variables. It is particularly beneficial when the relationships being tested involve multiple variables or when the aim is to develop a deeper understanding of how certain variables influence others in complex ways.

The findings of the analyses with 5000 resampling and 95% confidence interval are presented in Table 3.

Table 3. Hypothesis Tests

Regression Paths	Coeff.	Se	T	LLCI	ULCI
Digital Leadership → Digital Organisational Culture	0.452	0.054	7.851	0.247	0.401
Digital Leadership → IWB	0.281	0.041	6.125	0.201	0.345
Digital Organisational Culture → IWB	0.213	0.067	5.641	0.199	0.237
Mediation Effect					
<i>Indirect Effect</i> (Digital Leadership → Digital Organisational Culture → IWB)	0.144	0.025	-	0.088	0.216

*IWB: Innovative Work Behaviour*

The results in Table 3 confirm that digital leadership has a significant effect on digital organisational culture ( $\beta=0.452$ , CI [0.247, 0.401],  $p<0.05$ ) and innovative work behaviour ( $\beta=0.281$ , CI [0.201, 0.345],  $p<0.05$ ). In addition, digital organisational culture has a significant effect on innovative work behaviour ( $\beta=0.213$ , CI [0.199, 0.237],  $p<0.05$ ). These findings show that Hypothesis 1 is supported.

Another hypothesis of the study is that digital organisational culture plays a mediating role in the effect of digital leadership on innovative work behaviour. In order to test this hypothesis, the indirect effect of digital leadership on innovative work behaviour was examined. The results show that the indirect effect was significant ( $\beta=0.144$ , CI [0.088, 0.216],  $p<0.05$ ), indicating that digital organisational culture mediates the effect of digital leadership on intrapreneurship. This finding shows that Hypothesis 2 is supported.

## 5. Discussion

The findings of this study shed light on the intricate relationship between digital culture, digital leadership, and innovative work behavior, offering valuable insights for both scholars and practitioners in the field of organizational behavior and management. One key observation from this study is the symbiotic relationship between digital leadership and digital organizational culture. Digital leaders play a pivotal role in shaping organizational culture by championing technological innovation, fostering collaboration, and empowering employees to embrace digital tools and methodologies. Conversely, a strong digital culture can bolster the effectiveness of digital leadership initiatives, providing a fertile ground for innovation to flourish. This reciprocal influence underscores the importance of a holistic approach to digital transformation, where leadership practices and cultural norms are aligned to drive organizational success.

Another significant finding is the positive impact of digital leadership and digital culture on innovative work behavior within organizations. Employees who perceive their leaders as digitally competent and supportive are more likely to engage in creative problem-solving, experimentation, and knowledge sharing. Similarly, a culture that values agility, adaptability, and continuous learning fosters a mindset conducive to innovation. By providing the necessary resources, encouragement, and psychological safety, organizations can empower their employees to take calculated risks and explore novel ideas, ultimately enhancing their capacity for innovation.

These findings have several practical implications for organizational leaders and managers. Firstly, organizations should invest in developing digital leadership capabilities at all levels of the hierarchy, equipping leaders with the skills and knowledge needed to navigate the complexities of the digital landscape. Leadership development programs should not only focus on technical proficiency but also on fostering emotional intelligence, strategic thinking, and change management skills. Additionally, organizations must prioritize the cultivation of a digital culture that values experimentation, collaboration, and transparency. By fostering an environment where innovation is celebrated and failure is viewed as a learning opportunity, organizations can unleash the creative potential of their workforce and drive sustainable growth.

While this study provides valuable insights into the relationship between digital leadership, digital culture, and innovative work behavior, there are several avenues for future research that warrant exploration. Firstly, longitudinal studies could provide deeper insights into the long-term effects of digital leadership initiatives and cultural interventions on organizational performance. Additionally, cross-cultural research could help identify cultural differences in the

adoption of digital leadership practices and their impact on innovation outcomes. Moreover, qualitative research methods, such as in-depth interviews and case studies, could offer a richer understanding of the underlying mechanisms driving the observed relationships.

### ***Practical Implications***

One of the practical implications of the study is that organizations can draw on the findings of this study to design and implement leadership development programs that emphasize digital competencies, strategic thinking, and change management skills. By equipping leaders at all levels with the skills necessary to navigate the digital landscape, organizations can foster a culture of innovation and drive sustainable growth.

Understanding the interplay between digital leadership and organizational culture can inform cultural transformation initiatives aimed at fostering a digital-native mindset. Organizations can promote collaboration, experimentation, and continuous learning by aligning leadership practices with cultural norms that embrace technological innovation. By recognizing the importance of digital leadership and culture in promoting innovative work behavior, organizations can allocate resources strategically to support initiatives that drive digital transformation. Investments in technology infrastructure, training programs, and organizational processes can facilitate the adoption of digital tools and methodologies, empowering employees to innovate and adapt to changing market dynamics.

Moreover, organizations can integrate measures of digital leadership effectiveness and cultural alignment into their performance management systems. By linking leadership behaviors and cultural values to innovation outcomes, organizations can incentivize and reward behaviors that contribute to the organization's long-term success in the digital age.

### ***Theoretical implications***

It is particularly imperative to note that this study contributes to the advancement of leadership theory by highlighting the importance of digital leadership in driving organizational innovation. By integrating insights from the digital transformation literature with established leadership theories, scholars can develop more nuanced models of leadership that account for the unique challenges and opportunities posed by the digital age.

In the context of digital culture and leadership, fostering experimentation with digital tools, rewarding creative thinking, and supporting the implementation of digital solutions that enhance efficiency, customer experiences, and overall business performance can facilitate innovative work behavior. As they set the tone for accepting technological changes and fostering creativity throughout an organization, digital leaders are vital in promoting and modeling such behaviors (Al-Omari et al., 2019).

The study underscores the complexity of organizational culture and its role in shaping innovation outcomes. By exploring the dynamic interplay between digital leadership, cultural norms, and innovation behaviors, scholars can deepen their understanding of the mechanisms driving cultural change within organizations and develop theoretical frameworks that capture this complexity. By examining the influence of digital culture on employee behavior and organizational performance, this study contributes to the integration of technology and human behavior research. By elucidating the ways in which digital tools and methodologies shape employee attitudes and behaviors, scholars can develop more holistic theories of technology adoption and organizational change.

Finally, this study highlights the importance of considering cross-cultural differences in the adoption of digital leadership practices and their impact on innovation outcomes. By conducting comparative studies across different cultural contexts, scholars can identify cultural factors that facilitate or hinder the adoption of digital leadership practices and develop culturally sensitive strategies for promoting innovation in organizations worldwide.

The practical and theoretical implications of this study provide valuable insights for both practitioners and scholars seeking to navigate the complexities of digital transformation and foster a culture of innovation within organizations. By leveraging digital leadership and culture as drivers of organizational change, organizations can position themselves for success in an increasingly digitalized world.

## **6. Conclusion**

This research specifically examines how digital culture influences creative work behavior. From the perspective of digital leadership, it emphasizes and demonstrates the importance of digital culture, while also examining the degree to which organizational digital maturity and digitalization affect leadership. The leadership style of leaders and managers at various levels of an organization's hierarchy can have an impact on digital maturity, which is clearly measurable and recognized in that organization. Managers and leaders at different hierarchical levels can thrive digital working environments courtesy of digital leadership.

The influence of digital culture and digital leadership on innovative work behavior is a pivotal aspect of organizational success in the digital age. As organizations strive to embrace sustainability and efficiency, the role of digital leaders in shaping a culture of experimentation, providing tools for innovation, and removing implementation impediments cannot be overstated. By understanding and harnessing the interconnected relationship between digital culture, digital leadership, and innovative work behavior, organizations can position themselves as frontrunners in the ever-evolving landscape of digital transformation. The research investigated the influence of digital culture and digital leadership on innovative work behavior within organizations. Through a comprehensive analysis, the study revealed significant relationships between these factors and provided insights into their interplay.

Firstly, the findings underscored the pivotal role of digital leadership in shaping both digital organizational culture and innovative work behavior. Digital leaders who possess a clear vision of digital transformation and exhibit enthusiasm for technological advancements can effectively foster a culture that values experimentation, collaboration, and continuous learning. Consequently, employees are more likely to engage in innovative behaviors, contributing to the organization's overall adaptability and competitiveness.

Secondly, the study highlighted the mediating role of digital organizational culture in the relationship between digital leadership and innovative work behavior. A strong digital culture serves as a catalyst, amplifying the impact of digital leadership initiatives on fostering creativity and innovation among employees. By promoting an environment that embraces technological change and encourages risk-taking, digital organizational culture facilitates the translation of innovative ideas into tangible outcomes.

These findings have significant implications for organizational practice and future research. Organizations striving to thrive in the digital age must prioritize the development of digital leadership capabilities and cultivate a supportive digital culture. Investing in leadership training programs that emphasize digital competencies and promoting collaborative initiatives that nurture creativity can enhance innovation performance and drive sustainable growth. Moreover, future research endeavors should delve deeper into the nuanced dynamics between digital leadership, digital culture, and innovative work behavior. Exploring contextual factors that moderate these relationships, such as organizational structure, team dynamics, and technology infrastructure, can provide valuable insights for refining theoretical models and informing evidence-based interventions.

The study underscores the significant need for organizations to embrace digital transformation holistically, recognizing the interconnectedness of leadership practices, organizational culture, and innovation outcomes. By fostering a culture of innovation guided by digitally savvy leaders, organizations can adapt to evolving market demands, seize emerging opportunities, and thrive in the digital era.

## **7. Limitation and Future Research**

It is important to acknowledge the limitations of this study. Firstly, the research was conducted within a specific geographical context, which may limit the generalizability of the findings to other cultural and organizational settings. Secondly, the study relied on self-reported data, which may be subject to social desirability bias and common method variance. Future research could address these limitations by employing multi-method approaches and conducting cross-cultural comparisons.

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### Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

### Data sharing statement

No additional data are available.

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