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# The Impact of Digital Leadership on SMEs' Innovation Performance: A Mediation-Moderated Model of Digital Capability and Innovation Culture

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**ABSTRACT**

Small and medium enterprises (SMEs) endeavor to achieve sustainability in the digital transformation age while leaders strive to develop their digital capabilities in response to the changes in the management landscape. The primary aim of this study is to investigate the effect of digital leadership (DL) on Kuwait's SME innovation performance. Further, examine the intermediate role of digital capability (DC) and innovation culture (IC) in the relationship between digital leadership and innovation performance. This study adopted a quantitative method. It administered a questionnaire survey to collect the data and managed to gather 274 valid data from out of 400 Kuwaiti SME owners and CEOs. The results revealed that digital leadership profoundly influenced the innovation performance of Kuwaiti SMEs. Digital capability was critical in mediating the relationship between SMEs' digital leadership and innovation performance, and innovation culture was pivotal in moderating the same relationship.

**Keywords:** Digital Leadership, Digital Capability, Innovation Culture, Innovation Performance
**JEL Classifications:** M21, M5, M100

## 1. INTRODUCTION

Industry 4.0 brings fundamental challenges to small and medium enterprises (SMEs), particularly in developing countries, that affect their business performance and sustainability (Dimoso and Utonga, 2024). Therefore, businesses must have new expertise to facilitate novel innovation, especially for their business models. Digital technology provides new organizations greater flexibility in creating new products and services while discovering different markets and disrupting existing businesses (Sasmoko et al., 2019). An organization's ability to recognize, comprehend, and manage technological and knowledge developments will determine the efficiency of its organizational management. Organizations that lack creative and contemporary ideas will degenerate when dealing with changes (Prakasa, 2022; Dimoso and Utonga, 2024). The primary issue for business owners and managers in the digital age is not the ability to adopt innovative solutions and technological tendencies and deal with changing consumer behavior but their ability to create an open innovation mindset, entrepreneurial culture, and competencies through virtual work (Prakasa, 2022). Consequently, SMEs need digital leaders capable of communicating their beliefs, values, and attitudes toward digital transformation.

Digital leaders must keep abreast with digital expertise and support the processes to explore, choose, and construct innovation capabilities. They should focus on nurturing creativity that contributes to creating value for customers by using advanced technologies to swiftly design digitally enabled services and build an organizational capability that delivers services that fulfill and often exceed the expectations of prospective customers (Al Issa and Omar, 2024). Digital leadership is a combination of leadership phenomenon and leveraging technology. It also combines the digital competency and innovative culture needed to spearhead

changes and capitalize on digital knowledge, which enhances customer satisfaction, maximizes organizational profits, and ensures the sustainability of SMEs (Shin et al., 2023). Digital leaders play a fundamental role in organizations because of their capability to effectively define digital business strategies that produce high innovation performance (De araujo et al., 2021).

Digital leadership requires effective digital capability to ensure the leveraged digital technologies achieve their goals. Digital capability is the process of transforming and integrating technological resources and optimally utilizing them in organizations (Xu et al., 2022). Within this context, digital leadership and digital capability are interdependent concepts that enable a smooth digital transformation in organizations and ensure the sustainability of organizations in the digital era. Therefore, organizations that wish to implement digital transformation must have a digital leadership responsible for formulating the vision and strategy that fosters a culture conducive to change and innovation (Al Issa and Omar, 2024; Xu et al., 2022). This leadership style is decisive in building and improving organizations' digital capability. A robust digital capability provides the fundamentals and resources leaders need to implement their digital strategies efficiently. Without digital capability, even the most visionary digital leaders would struggle to accomplish their objectives (Shin et al., 2023).

Digital leaders must be able to integrate digital capability with innovation culture to encourage employees to develop their digital abilities and skills to facilitate the transformation from a traditional to a modern business model (Al Issa and Omar, 2024). Innovative culture (IC) drives the receptiveness to creative ideas and fosters the competencies necessary to adopt the technologies fundamental for product or service development. Innovation culture motivates the acceptance of technological changes, reduces stress and resistance toward change, and encourages employee engagement (Shin et al., 2023). The framework for digital leadership proposes an association between leadership and organizational factors such as digital capability; it guides innovation culture as an enabler facilitating the adoption of digital capability and skills among employees, thus enhancing the organization's innovation performance (Al Issa and Omar, 2024).

Even though most SMEs aim to develop new digital business strategies, they do not always appreciate the role of digital leadership in the development process (Karollah and Juned, 2023). Therefore, this study suggests that SMEs can improve innovation performance and achieve sustainability by adopting an appropriate digital leadership style and focusing on modern digital capability through an effective innovation culture. Significantly, few studies focused on the contribution of digital leadership in enhancing the innovation performance of organizations (Shin et al., 2023; Sri & Wahyuningsih., 2024; Fang, 2023; Schuster et al., 2023; Sarfraz et al., 2022). Several studies investigated the impact of various leadership styles, such as participative leadership (Fatima et al., 2017), transformational leadership (Li et al., 2019), and ethical leadership (Iqbal et al., 2020), on innovation; however, few examined the effects of digital leadership on innovation performance (Erhan et al., 2022; Khaw et al., 2022). Additionally, from the capability-based perspective, digital capabilities are critical resources ensuring organizational success. Therefore, more studies are required to uncover the mechanisms of this process in developing innovation performance (Xu et al., 2022; Dimoso and Utonga, 2024).

According to, the emphasized gaps in current literature, the purpose of this study is twofold. Based on the identified literature gap, the twofold objective of this study is as follows. The first objective is to contribute to current knowledge by examining how digital leadership directly affects the innovation performance of SMEs in Kuwait. The second is to gain better insight into the association of digital leadership with innovation performance by exploring the role of intermediate mechanisms represented in digital capability and innovation culture. Consequently, the following research questions serve as the study guide.

RQ1. What is the impact of SMEs' digital leadership on innovation performance?

RQ2. What is the impact of SMEs' digital leadership on digital capability?

RQ3. What is the impact of SMEs' digital capability on innovation performance?

RQ4. How does digital capability serve as a mediator that consolidates the relationship between SMEs' digital leadership and innovation performance?

RQ5. How does innovation culture moderate the consolidation of the relationship between SMEs' digital leadership and innovation performance?

## 2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

### 2.1. The Relationship between Digital Leadership and Innovation Performance

The term digital leadership in the literature emphasizes a leader's ability to adapt to new technology, different data types, and digital tools in leading their teams and organizations to succeed in a digital world (Shin et al., 2023; Sri & Wahyuningsih., 2024; Fang, 2023; Schuster et al., 2023). Digital leadership is the leaders' ability and knowledge to effectively manage organizations in the digital age through efficient business skills, practical decision-making ability, practical knowledge, and the skill to use and impart knowledge which related with digital platforms. Therefore, digital leaders must understand how technology influences business operations to manage innovation effectively (Sagbas et al., 2023). Senadjki et al. (2023) indicated that digital leadership means integrating culture and digital capability to exploit digital technology as a part of leadership that imparts value to the organization. Critically, digital leaders must know how to identify favourable moments and evaluate digitalization-related risks, a skill interconnected to a digital outlook understood as an iterative learning process (Hensellek, 2020).

A leader's competence and leadership style will determine the favourable outcome of a digitalization process. The literature has demonstrated a significant relationship between the leader's abilities and the successful implementation of a digitization process reflecting the development of innovation performance

(Chen and Hao, 2022; Senadjki et al., 2023). Ladkin and Patrick (2022) found that employee skill development and overall performance depend heavily on the leader's capability. Similarly, Shin et al. (2023) demonstrated that digital leadership had direct and indirect positive impacts on organizational performance. The literature review revealed that numerous studies are concerned with leadership and performance. Despite the significant role of leadership style in ensuring performance, few studies examined how digital leadership influenced innovation performance (Benitez, 2022; Khaw et al., 2022; Shin et al., 2023). In this respect, Benitez (2022) pointed out the dearth of in-depth research on the effect of digital leadership on innovation performance. Even though most previous studies suggested that leaders are the vital factor determining organizational achievement, they did provide empirical evidence for how digital leaders promote innovation performance. Concerning the SMEs in Kuwait, there is a need for more comprehensive research examining this relationship, and therefore, this study proposes the following hypothesis.

$H_1$: Digital leadership has a positive effect on SMEs' innovation performance.

## 2.2. The Relationship between Digital Leadership and Digital Capability

Proksch et al. (2021) and Xu et al. (2022) discussed the positive effects of digital capability on innovation models and entrepreneurial initiatives. Other researchers reported that organizational success relies on having digital capabilities, which require understanding digital technologies and aligning them with the new environment of the digital world (Proksch et al. 2021). Wang and Li (2023) defined digital capabilities as an organization's ability to recognize digital technology and swiftly create new processes and products to respond to the continuously evolving technological environments. In this vein, Liang et al. (2024) conceptualized digital capability as an organization's capability to integrate digital technologies into the existing business functions and use digital resources to develop enterprise management models.

Digital leadership can influence different elements of individuals and teams, such as the behaviour and skills in virtual work settings. These elements are the intermediaries in the relationship between inputs, outputs, and organizational outcomes of a digital economy (Phakamach et al., 2023). The significant disruption of the business landscape necessitates a swift adoption of digital applications and all stages of digital transformation (Wang and Li., 2023: Phakamach et al., 2023). Therefore, it is essential to integrate digital leadership capabilities like virtual team effectiveness with the current system to encourage the adoption of new digital capabilities and develop service processes, increase market share, and formulate innovative strategies to gain competitive advantages (Hasan et al., 2024; Mollah et al., 2023). In this context, Azzam et al. (2023) considered digital leadership as a pivotal catalyst guiding organizations to dynamically interact with the business environment through its role in facilitating the adoption of digital capabilities to give the organization more agility in responding to the fluctuations in contemporary business.

Several previous studies have confirmed the significant impact of digital leadership on digital capability. (Ramadhan et al., 2024: Lu et al., 2024). In this vein, Mollah (2023) demonstrated the significant impact of digital leadership on digital capability and organizational learning which resulted in sustained organizational performance. Further, Lu et al., (2024) digital leadership is vital for creating organizational sustainability, as it improves performance both directly and indirectly through leadership capabilities. Although the outcomes of various studies supported the association between digital leadership and digital capability, it is imperative to conduct more studies to gain insight into how digital leadership affects the digital capabilities of SMEs in developing countries. Therefore, this study proposes the following hypothesis.

$H_2$: Digital leadership has a positive effect on SMEs' digital capability.

## 2.3. The Relationship between Digital Leadership, Digital Capability, and Innovation Performance

More recently, researchers focused on the relationship between digital leadership and innovation performance. Previous studies reported digital leadership as a significant antecedent for innovation performance (Chen and Hao, 2022; Karim et al., 2021; Senadjki et al., 2023; Ladkin and Patrick, 2022). Previous research found that digital leaders have the ability to lead individuals, teams, or whole organisations by entirely leveraging digital thinking through connecting digital insight, decision-making, implementation, and guidance to ensure their objectives are accomplished. Digital leadership is critical in enhancing innovative performance because they know how to use digital resources at work efficiently to motivate the organization and its operations (Aldoghan et al., 2022; Zia et al., 2024; Fang, 2023; Senadjki et al., 2023). Other studies obtained inconsistent and contradictory results on the relationship between digital leadership and innovation performance. For example, Muniroh et al. (2022) did not observe any impact of digital leadership on employee performance, including their innovation capability. Moschko and Blazevic (2022) determined that digital leadership had an indirect effect on innovation, and it often depended on other internal and external variables that were not conclusively established.

The contradicting findings in previous literature indicate the need to integrate the link between digital leadership and innovation performance with other intermediate variables to enhance the effects of digital leadership on innovation performance and conduct further analysis of this nexus. A better comprehension of digital capability is crucial since it has been determined to be a prerequisite for digital leadership (Zia et al., 2024). Organizational success in the present-day business environment relies heavily on adopting and integrating digital tools since they consolidate digital leadership's role in fostering an innovation culture that facilitates a smooth transition from the traditional to digital processes, thus assuring the accomplishment of organizational goals (Zia et al., 2024; Chen and Hao, 2022).

Researchers deem digital capability a pivotal tool that drives innovation and thus enhances an organization's innovation performance (Kastelli et al., 2022; Salleh et al., 2020). Jiang et al. (2022) referred to digital capabilities as the operational and technological capacities that allow SMEs to leverage digital platforms effectively. Therefore, it is a critical factor influencing

innovation performance. Wang et al. (2022) defined digital capability as an organization's high-level capability to shape intelligence, connect products and services, and perform data analytics to facilitate the provision of service delivery.

Digital capability helps organizations to adopt digital technology and create customer value and thus enhance organizational efficiency to achieve success in a customized service environment (Wang et al., 2022). Several studies investigating the impact of digital capability on innovation performance, including Zahid et al. (2023), found that digital capability positively impacts an organization's innovation performance and proposed that organizations should leverage digital capability to improve their innovative ability and respond to market changes effectively. In addition, a study implemented by Kastelli et al. (2022) showed that digital capacity was a critical determiner of innovation performance. Consequently, organizations with higher digital capacity often have superior innovation outcomes.

Even though many studies affirmed the significance of digital leadership and digital capability in enhancing innovation performance, it is still essential to investigate the impacts of integrating these variables in the context of SMEs in developing countries. This study investigated the mediation role of digital capability on the link between digital leadership and innovation performance and proposed the following hypothesis.

$H_3$: Digital capability has a positive effect on SMEs' innovation performance.

$H_4$: Digital capability mediates the relationship between SMEs' digital leadership and innovation performance.

### 2.4. The Relationship between Digital Leadership, Innovation Culture, and Innovation Performance

The pursuit of innovation performance concerns developing the required technology to enhance value creation by shifting to digital solutions (Shin et al., 2023; Chen and Hao, 2022; Ladkin and Patrick, 2022). It involves integrating digital leadership with new structures, culture, practices, and actors that are threats to the current rules of the business environment (Wang and Sheng, 2022; Al Issa and Omar, 2024). The literature review showed that digital leadership depends on an organization's resources to enhance its innovation performance (Shin et al., 2023), and one of the essential resources in achieving the desired level of innovation performance is innovation culture (Ismail, 2024). Even though innovation processes, technology, strategy, and market share are critical factors for enterprises, a distinctive innovation culture is also pivotal in ensuring they are distinct from their rivals (Yılmaz et al., 2024). Innovation culture represents organizational norms, shared values, and employees's beliefs about building and creating innovative solutions (Wang and Sheng, 2024; Ismail, 2024). Accordingly, organizations are encouraged to adopt innovative culture and embrace novel ideas to cultivate the necessary capabilities to effectively integrate complex technologies essential for the creation of new products and services (Yılmaz et al., 2024; Al Issa and Omar, 2024).

The digital leadership framework puts forth there is a link between leadership and organizational elements and depends on innovation culture as the enabler facilitating digital leadership strategies (Wang and Sheng, 2024). Previous studies identified a significant link between innovation culture and innovation performance. Widtayakornbundit and Luangpituksa (2023) determined that innovation culture has a fundamental impact on innovation performance, which guides members of an organization in the pursuit of innovation, sustainable organizational performance, and the ability to adapt to future changes. Ghasemzadeh (2019) has also demonstrated the strong influence of innovation culture on innovation performance.

Several studies investigating how digital leadership affects innovation performance discovered a complex relationship between digital leadership can have a complex relationship with innovation performance, which has negative consequences if not properly managed. Although digital leadership seeks to foster innovation, certain factors can limit its effectiveness (Zhong et al., 2023; Moschko and Blazevic, 2022; Muniroh, 2022). For example, Zhong et al. (2023) found that while digital leadership significantly affects an organization's innovation performance, employee followership might have negatively moderated the relationship. Similarly, Moschko and Blazevic (2022) suggested that digital leadership did not always ensure better innovation outcomes. (Muniroh, 2022) demonstrated that the cultural and learning barriers within organizations could diminish the effectiveness of digital leadership. In some situations, digital leadership may not affect performance or innovation directly, suggesting that other variables like organizational culture and learning play an intermediary role in this relationship.

Even though many previous studies have attempted to determine how digital leadership affects innovation performance, the findings were contradictory and inconclusive. Few studies focused on measuring the effects of innovation culture as a moderator variable in the relationship between digital leadership and innovation performance. One of the primary contributions of this study is bridging a critical literature gap by investigating this link. Therefore, it proposes the following hypothesis.

$H_5$: Innovation culture moderates the relationship between SMEs' digital leadership and innovation performance.

## 3. CONCEPTUAL FRAMEWORK

The basis for the conceptual framework in this study is the findings of previous research on the current variables and the Resource-Based View (RBV) theory. RBV states that internal resources and capabilities are the critical determiners of organizational performance. This perspective suggests organizations can attain a competitive advantage by effectively leveraging their internal resources. The proposed model describes the relationship between four variables and their impact on Kuwaiti SMEs. The variables comprise four categories: (1) independent variable: Digital leadership), (2) dependent variable: innovation performance, (3) mediating variable: Digital capability, and (4) moderating variable: Innovation culture, as shown in Figure 1. Notably, this study is among the few that explore the role of SMEs' digital capability as a mediating variable and innovation culture as a moderating factor in the link between digital leadership and innovation performance to gain insight into the dynamics.

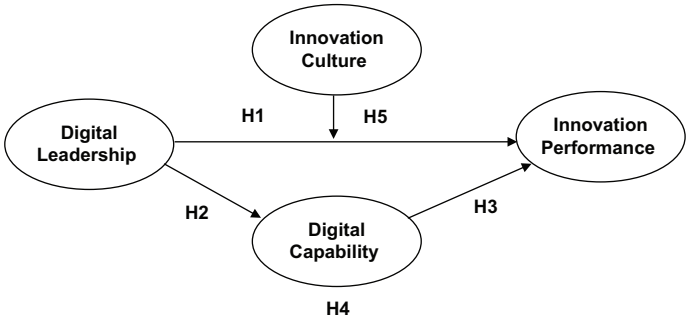
## 4. METHODOLOGY

This study proposes a new conceptual model integrating three critical constructs (digital leadership, digital capability, and innovation culture) for SMEs' innovation performance. It adopts a quantitative approach and tests the structural model using a variance-based structural equation modelling. The verification of the conceptual model used the data for Kuwait SMEs gathered by administering a well-organized survey questionnaire. The questionnaire was in Arabic and English and used a five-point Likert scale ranging from "strongly disagree" to "strongly agree." The questionnaire used simple and comprehensible terms to help the respondents understand the questions and provide answers from their perspectives. The survey items were adapted from previous studies with minor modifications when necessary to ensure content validity. The measurement scale for digital leadership was adapted from Shin et al. (2023), Xu et al. (2022) for digital capability, Leso et al. (2023) for innovation culture, and Bwaliez (2021) for innovation performance. The government agencies responsible for promoting socio-economic development and entrepreneurial growth in Kuwait (The Ministry of Commerce and Industry and The Kuwait National Fund for Small and Medium Enterprise Development) assisted in selecting the SMEs. The targeted population is the owners and CEOs of Kuwait SMEs. The sample selection employed a simple random sampling method, and the data collection was through a (face-to-face/online) survey. The questionnaire was distributed to 400 owners and CEOs of SMEs, and 289 SMEs returned the questionnaires. Eight questionnaires were eliminated after data cleaning, giving 274 usable questionnaires.

## 5. DATA ANALYSIS

The data was initially analyzed using SPSS in order to conduct descriptive analysis. Meanwhile, SmartPLS 4 was then used to carry out the primary analysis. Assessment of the measurement model takes into consideration the values for reliability and validity while the hypotheses were tested using bootstrapping methods to determine the significance of the proposed relationships. Hair et al. (2019) pointed out that there are many reasons to use SmartPLS are: "When the structural model is complex and includes many constructs, indicators and/or model relationships; when the research objective is to better understand increasing complexity by exploring theoretical extensions of established theories (exploratory research for theory development); when the path model includes one or more formatively measured constructs; when the research consists of financial ratios or similar types of data artifacts".

**Figure 1:** Conceptual framework




The descriptive analysis including minimums, maximums, means, standard deviations, and variances of all constructs are shown in Table 1. Digital leadership achieved a value of 3.82 for mean, 1.02 for standard deviation, and 1.01 for variance. Digital capability achieved a value of 4.13 for mean, 0.78 for standard deviation, and 0.54 for variance. Innovation culture achieved a value of 3.99 for mean, 1.14 for standard deviation, and 0.88 for variance. Innovation performance achieved a value of 3.84 for mean, 1.23 for standard deviation, and 0.96 for variance. As a result, all constructs of this study are above the acceptance level of implementation (Bougie and Sekaran, 2019).

The assessment of the measurement model included factor loadings, Cronbach's alpha, composite reliability, average variance extracted (AVE), and HTMT correlations. Table 2 shows an analysis of convergent validity for four key constructs in the study: Digital Leadership (DL), Digital Capability (DC), Innovation Culture (IC), and Innovation Performance (IP). Convergent validity assesses whether items that are intended to measure the same concept are strongly correlated, ensuring they truly reflect the underlying construct. In this case, each construct consists of several items, and their relationships are measured through factor loadings, Cronbach's Alpha, composite reliability (CR), and average variance extracted (AVE). The table's data indicates strong internal consistency and validity across all constructs, confirming the soundness of the measurement model.

Factor loadings are used to determine the strength of the relationship between each item and its corresponding construct. The general rule of thumb is that a factor loading above 0.7 indicates a strong relationship, and nearly all the items in this table surpass this threshold. For instance, the items within Digital Leadership (DL3 = 0.903, DL5 = 0.894, and DL6 = 0.929) have particularly high loadings, indicating that these items are strongly correlated with the underlying concept of digital leadership. Similarly, items in Digital Capability, Innovation Culture, and Innovation Performance also show high loadings, which means that they adequately measure their intended constructs. This strong alignment between the items and their constructs demonstrates good convergent validity.

**Table 1: Descriptive analysis**

| Construct | Minimum | Maximum | Mean | Standard deviation | Variance |
|---|---|---|---|---|---|
| Digital leadership | 1 | 5 | 3.82 | 1.02 | 1.01 |
| Digital capability | 1 | 5 | 4.13 | 0.78 | 0.54 |
| Innovation culture | 1 | 5 | 3.99 | 1.14 | 0.88 |
| Innovation performance | 1 | 5 | 3.84 | 1.23 | 0.96 |

**Table 2: Convergent validity**

| Construct | Items | Factor Loadings | Cronbach's Alpha | Composite reliability | AVE |
|---|---|---|---|---|---|
| Digital leadership | DL1 | 0.743 | 0.841 | 0.826 | 0.630 |
| | DL2 | 0.809 | | | |
| | DL3 | 0.903 | | | |
| | DL4 | 0.701 | | | |
| | DL5 | 0.894 | | | |
| | DL6 | 0.929 | | | |
| | DL7 | 0.743 | | | |
| Digital capability | DC1 | 0.732 | 0.810 | 0.797 | 0.593 |
| | DC2 | 0.865 | | | |
| | DC3 | 0.854 | | | |
| | DC4 | 0.917 | | | |
| | DC5 | 0.894 | | | |
| Innovation culture | IC1 | 0.896 | 0.903 | 0.901 | 0.712 |
| | IC2 | 0.913 | | | |
| | IC3 | 0.905 | | | |
| | IC4 | 0.933 | | | |
| | IC5 | 0.779 | | | |
| Innovation performance | IP1 | 0.896 | 0.889 | 0.860 | 0.657 |
| | IP2 | 0.913 | | | |
| | IP3 | 0.881 | | | |
| | IP4 | 0.705 | | | |
| | IP5 | 0.905 | | | |
| | IP6 | 0.857 | | | |

Cronbach's Alpha is a key indicator of internal consistency or reliability, with values above 0.7 considered acceptable. In this table, all constructs show strong reliability. For instance, Digital Leadership has a Cronbach's Alpha of 0.841, indicating that the items within this construct consistently measure digital leadership across different respondents. Similarly, Digital Capability (0.810), Innovation Culture (0.903), and Innovation Performance (0.889) exhibit high Cronbach's Alpha values, meaning that the items within these constructs are reliable indicators of the underlying concepts. High Cronbach's Alpha values are crucial for ensuring that the measurements can be replicated and are not subject to random errors or inconsistencies.

In addition to Cronbach's Alpha, composite reliability (CR) is another measure of internal consistency, often seen as a more accurate reflection of reliability, especially in confirmatory factor analysis. CR values above 0.7 are desired, and all constructs in this table meet this criterion. For example, Digital Leadership has a CR of 0.826, while Innovation Culture achieves a CR of 0.901. These values suggest that the items within these constructs consistently represent the construct in question, reinforcing the notion that these constructs are reliable. The strong CR values across all constructs further confirm the model's reliability and its appropriateness for further analysis.

AVE is used to assess how much variance in the items is explained by the construct, as compared to variance due to measurement error. An AVE above 0.5 is considered adequate, meaning the construct captures a substantial amount of variance from its items. In this table, all constructs exceed the 0.5 threshold, with Innovation Culture having an AVE of 0.712 and Innovation Performance at 0.657. These AVE values indicate that the constructs are not only reliable but also valid, as they explain more variance in the items than is attributable to error. The high AVE scores support the overall convergent validity of the measurement model. In conclusion, the table confirms that the constructs of Digital Leadership, Digital Capability, Innovation Culture, and Innovation Performance have strong convergent validity. The factor loadings, Cronbach's Alpha, composite reliability, and AVE all point to the high internal consistency and reliability of the constructs. This suggests that the measurement model is well-suited for further analysis and that the constructs are accurately and reliably represented by their corresponding items.

Table 3 presents the HTMT (Heterotrait-Monotrait) correlations, which are used to assess the discriminant validity of the constructs in the study. Discriminant validity ensures that constructs that are theoretically distinct are empirically different in the model, meaning they measure different aspects and do not overlap in their conceptual definitions. In this table, the HTMT values between four constructs—Digital Leadership, Digital Capability, Innovation Culture, and Innovation Performance. The value between Digital Leadership and Digital Capability is 0.584, indicating a moderate relationship between these two constructs, but it is well below the threshold of 0.85, meaning they are distinct. Similarly, the HTMT correlation between Digital Leadership and Innovation Culture is 0.236, which is quite low, demonstrating that these constructs are highly distinct. The correlation between Digital Leadership and Innovation Performance is 0.478, which is below the threshold but shows a stronger relationship compared to innovation culture.

The relationship between Digital Capability and Innovation Culture is shown by the HTMT value of 0.632, indicating a moderate correlation. While both constructs involve organizational processes and capacities, Digital Capability is more technical and resource-based, whereas Innovation Culture is about fostering an environment conducive to innovation. The distinct nature of these constructs is validated by the fact that the HTMT value remains below 0.85, confirming that they are not conceptually redundant. Lastly, the HTMT value between Digital Capability and

Innovation Performance is 0.589, showing a moderate relationship but sufficient distinctiveness. In summary, all HTMT values in the table are below the recommended threshold of 0.85 (Aburumman et al., 2022), confirming that Digital Leadership, Digital Capability, Innovation Culture, and Innovation Performance are distinct constructs with good discriminant validity.

The structural model was examined in order to hypotheses test (direct and indirect effects). Table 4 presents the results of hypothesis testing for the direct effects between the constructs. The first hypothesis, H1, tests the relationship between Digital Leadership (DL) and Innovation Performance (IP). The results show a path coefficient of 0.221, indicating a positive direct effect of digital leadership on innovation performance. The T = 2.291, and the P = 0.011, which is statistically significant at the 0.05 level. The 95% confidence interval (0.057-0.376) does not cross zero, further supporting the finding that digital leadership has a significant and positive impact on innovation performance. The second hypothesis, H2, explores the effect of Digital Leadership (DL) on Digital Capability (DC). The path coefficient is 0.246, indicating a moderately strong and positive effect of digital leadership on the organization's digital capabilities. With a T = 2.272 and a P = 0.012, this relationship is also statistically significant at the 0.05 level. The confidence interval (0.055-0.416) confirms that the effect is both positive and significant.

The third hypothesis, H3, examines the impact of Digital Capability (DC) on Innovation Performance (IP). This relationship shows a strong positive path coefficient of 0.462, suggesting that digital capability significantly boosts innovation performance. The T = 3.802 is quite high, and the P = 0.000 indicates that this relationship is statistically significant at the 0.001 level. The confidence interval (0.265-0.678) further confirms the robustness of this effect. Finally, all three hypotheses—H1, H2, and H3—are supported by the data, indicating that Digital Leadership positively influences both Digital Capability and Innovation Performance, while Digital Capability significantly enhances Innovation Performance. These findings highlight the critical role that digital leadership and capability play in fostering innovation and ensuring organizational success in the digital era.

Using the bootstrapping technique (Preacher and Hayes, 2008), we examined mediating and moderating effects with 5000 resamples. Table 5 provides the results of testing for mediating and moderating effects in the relationships between Digital Leadership (DL), Digital Capability (DC), Innovation Culture (IC), and Innovation Performance (IP). These results assess whether Digital Capability and Innovation Culture play intermediary or moderating roles in the effect of Digital Leadership on Innovation Performance. The table includes the indirect effects, T-values, P-values, and the confidence intervals (95% lower limit and upper limit). If the P-value is below 0.05, the indirect effect is considered statistically significant.

The fourth hypothesis, H4, tests for the mediating effect of Digital Capability (DC) on the relationship between Digital Leadership (DL) and Innovation Performance (IP). The indirect effect is 0.111, indicating a positive mediating effect. The T = 1.813 and P = 0.035 show that this mediating relationship is statistically significant at the 0.05 level. The confidence interval ranges from 0.025 to 0.226, further confirming the positive mediating effect. The fifth hypothesis, H5, explores the moderating effect of Innovation Culture (IC) on the relationship between Digital Leadership (DL) and Innovation Performance (IP). The indirect effect here is 0.104, with a T = 1.695 and a P = 0.048, indicating statistical significance at the 0.05 level. The confidence interval ranges from 0.031 to 0.244, supporting the presence of a positive moderating effect.

Finally, both hypotheses H4 and H5 are supported, showing that Digital Capability serves as a mediator and Innovation Culture as a moderator in the relationship between Digital Leadership and Innovation Performance. These findings emphasize the importance

**Table 3: HTMT correlations**

| Construct | Digital leadership | Digital capability | Innovation culture | Innovation performance |
|---|---|---|---|---|
| Digital leadership | | | | |
| Digital capability | 0.584 | | | |
| Innovation culture | 0.236 | 0.632 | | |
| Innovation performance | 0.478 | 0.589 | 0.369 | |

**Table 4: Hypothesises test results (direct effect)**

| No. | Hypotheses | β | T-Value | P-value | Confidence interval | | Decision |
|---|---|---|---|---|---|---|---|
| | | | | | 95% LL | 95% UL | |
| H1 | DL→IP | 0.221 | 2.291 | 0.011* | 0.057 | 0.376 | Supported |
| H2 | DL→DC | 0.246 | 2.272 | 0.012* | 0.055 | 0.416 | Supported |
| H3 | DC→IP | 0.462 | 3.802 | 0.000*** | 0.265 | 0.678 | Supported |

*P<0.05; **P<0.01; ***P<0.001

**Table 5: Mediating and moderating test results (indirect effect)**

| No. | Hypothesis | Indirect effect | T-value | P-value | Confidence interval | | Decision |
|---|---|---|---|---|---|---|---|
| | | | | | 95% LL | 95% UL | |
| H4 | DL→DC→IP | 0.111 | 1.813 | 0.035* | 0.025 | 0.226 | Supported |
| H5 | DL→IC→IP | 0.104 | 1.695 | 0.048* | 0.031 | 0.244 | Supported |

*P<0.05

of enhancing an organization's digital capabilities and fostering a culture of innovation to maximize the positive effects of digital leadership on innovation performance.

## 6. DISCUSSION OF THE FINDINGS

The five hypotheses proposed in this study were validated using a statistical process. The empirical results revealed that digital leadership positively influenced innovation performance, concurring with the result of previous studies (Shin et al., 2023; Leena et al., 2024; Sri & Wahyuningsih, 2024; Schuster et al., 2023). Sri & Wahyuningsih (2024) found that digital leadership significantly affected innovation performance, indicating that leaders who efficiently utilize digital strategies and tools boosted their ability to innovate and perform better in a competitive market. Similarly, Fang (2023) discovered a profound effect of digital leadership on innovation performance, which resulted in better innovation capabilities, particularly in areas such as process innovation, product enhancement, and business model innovation. Schuster et al. (2023) employed a multi-method exploratory research design to investigate the antecedents of innovative work behavior and service innovation performance. They found that digital innovation is one of the crucial factors impacting innovation performance. Based on the outcomes of these studies, it is possible to conclude that digital leadership is critical in fostering an organization's innovative culture and performance. Therefore, organizations can strategically leverage digital leadership to increase innovation outcomes.

The empirical result supported $H_2$ concerning the digital leadership-digital capability relationship, consistent with previous studies that suggested digital leadership is one of the critical antecedents of digital capability. Ramadhan (2024) Indicated that digital leadership have vital influence on digital capabilities and business performance which mediated by digital innovation. Mollah (2023) reported strong positive associations between digital leadership and IT capabilities and between digital leadership and organizational learning. In particular, they identified a significant correlation between digital leadership and IT capabilities. Shin et al. (2023) discovered that digital leadership positively shaped the digital capabilities that enabled sustained innovative performance.

The study results affirmed $H_3$ that digital capability has a positive effect on innovation performance, similar to previous studies, including Kastelli et al. (2022), Jiang et al. (2022), Wang et al. (2022), and Zahid et al. (2023). Even though some previous research demonstrated the relationship between digital leadership and innovation performance, others observed a negative link between SMEs' digital leadership and innovation performance (Muniroh et al., 2022; Moschko and Blazevic, 2022). This study proposed $H_4$ to determine the mediating role of digital capability in simulating the link between digital leadership and innovation performance to bridge the significant literature gap regarding digital leadership and innovation performance.

Researchers urged for more studies to include intermediate variables in their investigations of the relationship between digital leadership and innovation performance for an enhanced understanding of the relationship (Muniroh et al., 2022; Moschko and Blazevic, 2022). Previous studies recommended combining moderation mechanisms to strengthen the relationship between SMEs' digital leadership and innovation performance (Hassan et al., 2024; Arham et al., 2024). Based on these recommendations, this study examined innovation culture as a moderating variable in the association between digital leadership and innovation performance. Studies by Hassan et al. (2024) and Arham et al. (2024) indicated that innovation culture is a moderator that enhances the effects of digital leadership on innovation outcomes. A strong innovation culture encourages the collaboration and knowledge sharing necessary for successful innovations. The outcomes of this study showed that innovation culture is a vital moderator in the association between SMEs' digital leadership and innovation performance.

## 7. CONCLUSION

Through its 2035 vision, Kuwait aims to develop the national economy and diversify income sources by engaging citizens in driving economic development. Kuwait considers the SME sector a critical sector contributing to the betterment of the national economy. Kuwait SME owners in recent years have been facing continuous challenges in improving their business performance, abilities, and innovations. This study has provided empirical evidence for the significant impact of digital leadership on innovative performance and proven that digital leadership facilitates a successful SME transformation that enables them to create new business values for the customers. Digital leadership is more than an enhancement or extension of traditional leadership; it is a redefinition of leadership for the digital era. Besides technological competence, it also emphasizes strategic vision, fostering collaboration within organizations, and shaping an innovation culture in a digital landscape. Digital leadership enables SMEs to assess the market and actively engage with stakeholders, thus enhancing their ability to swiftly and efficiently respond to digital challenges and market fluctuations.

Creating digital capability in the SMEs can enhance and facilitate the development of SMEs' innovation performance and entrepreneurship orientation. Digital capability ensures sustainable SME development through its effect on creating social value. Managers who adopt a digital leadership style are more cognizant of sustainable technological opportunities and are likely to achieve digital sustainable entrepreneurship that enables them to create new products and services, acquire more resources swiftly at lower costs, create added value for their customers, and gain superior competitive advantage. Therefore, SMEs should focus on improving their digital capability and nurture the synergy of digital leadership and digital capabilities to achieve better efficiency and drive innovation performance.

This study expanded the discussion and research on the contribution of digital leadership to innovation performance; it also proposed the moderation role of innovation culture in enhancing the impact of digital leadership on improved innovation performance. The open innovation culture facilitated employee acceptance of the changes at work and the transition from traditional to technological processes, which require learning new skills and different roles

to accomplish their daily work innovatively. In conclusion, the synergy between digital leadership, digital capabilities, and innovation culture capabilities is positively correlated with innovation performance, thus highlighting that SMEs should recognize the significance and combine these competencies to continue flourishing in the era of the digital economy.

This study developed a custom model for SMEs and tested the model by analyzing the data gathered from the owners and CEOs of SMEs in Kuwait. Future researchers should compile data from respondents across the globe to generalize the study outcomes and broaden their applicability. The conceptual framework focused on digital capability and innovation culture as the effective variables playing an intermediary role between SMEs' digital leadership and innovation performance. However, other mechanisms, such as digital innovation orientation, green innovation process, and innovative work behavior, could also affect innovation performance. Future studies should investigate these variables to identify the key predictors for ensuring performance. Furthermore, a longitudinal approach might offer more robust conclusions.

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