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DRIVING SUSTAINABLE BUSINESS PERFORMANCE THROUGH DIGITAL LEADERSHIP: THE MEDIATING ROLE OF DIGITAL WORKFORCE CAPABILITIES IN PAKISTANI SMES

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Abstract

The study investigates digital leadership i.e., capabilities, experiences, predictability and vision as the drivers of sustainable business performance in SMEs of Pakistan through digital workforce capabilities. Based on the concept of dynamic capabilities, digital leaders are defined as managerial actors who detect technologic opportunities, trigger reactions, and restructure employee skill sets and routines in order to generate economic, social and environmental value. A cross sectional design was used. A questionnaire was used to obtain data using a physically administered approach from 523 SMEs managers using convenience sampling. Partial least squares structural equation modeling (PLS-SEM) was used to test the measurement and structural models. There was a positive relationship between each of the digital leadership dimensions (i.e., capabilities, experiences, predictability and vision) and sustainable business performance, and there was a positive relationship between the digital workforce capabilities and sustainable business performance. The influence of sustainable performance was also mediated by digital workforce capabilities, for all four dimensions of leadership. The study adds by combining the four aspects of leadership capabilities, experience, predictability and vision in one SME model with the digital capability and the outcomes of sustainable workforce level. In essence, it demonstrates to Pakistani SME owners and managers that investing in technology yields better sustainability results when leadership is translated to skills, confidence, work together, and digitally enabled routines among employees. The results put workforce capability at the center of the operational connection between digital leadership and long-term performance.

1. INTRODUCTION

Digitalization is changing the value creation, coordination and reaction of companies to sustainability. Instead of just buying software, for SMEs, transformation now means reconceptualizing strategy, routines, and business models on data and connected technologies. Recent reviews relate SME digitalization to productivity, innovation, resilience and sustainability in the presence of organizational capabilities (Melo et al., 2023). Complementary managerial and operational resources are more beneficial when the firms develop them (Kallmuenzer et al., 2025). Digital orientation also benefits SMEs in aligning investments, learning, and competitiveness over the long term with a clear digital orientation (Barragan & Becker, 2025).

In Pakistan, SMEs are grappling with limited capital, unequal infrastructure, a lack of skills, and economic uncertainty, all of which pose significant challenges. A large number of companies utilize digital payment systems, social media, cloud applications and also enterprise platforms, but have problem connecting them with coherent processes. The findings from Pakistan reveal that the adoption of digital technologies can stimulate economic and social value creation when organizations are ready for it (Soomro et al., 2024). Digital strategy also impacts environmental performance by the level of digitalization of Pakistani SMEs (Haq et al., 2023). Therefore, managers have to strive for efficiency, growth and better welfare of the employees, responsiveness to the stakeholders and environmental responsibility.

Focused study required due to the fact that research often focuses solely on digital transformation, leadership, employee skills or sustainable performance. There is a need for interconnected awareness, strategy, adoption, and continuous improvement to work together for successful SME transformation (Kahveci, 2025). The review also reveals that the outcomes of digitalization are influenced by the quality of leadership, readiness for the workforce, and dynamic capabilities (Sagala & Ori, 2024). However, little is known about the extent to which different digital leadership dimensions can develop the capability of the workforce and in turn sustainable performance within emerging-market small and medium-sized enterprises. This gap is important because technologies cannot enhance sustainability without the ability of employees to access data, engage in digital interactions, address problems and modify procedures successfully (Wang et al., 2024b).

The model consists of four independent variables, one mediator and one outcome. Digital leadership capabilities refer to the mobilization of resources, experience to learning from previous digital projects, predictability to consistency in decision making and vision to a credible digitally enabled future (Senadjki et al., 2024). Digital workforce capabilities are the integrated capacity of employees to leverage digital knowledge, tools and working patterns. Sustainable business performance is an integration of economy (resilience), social value (value), and environmental responsibility (environment). Previously, digital leadership has been linked to SME transformation (Imran et al., 2025), digital workplace conditions to performance (Chatterjee et al., 2023a) and digital capability with sustainable competitiveness (Al-Omush et al., 2023).

The proposed configuration has not been tested as an integrated configuration in a real setting. Researchers usually view digital leadership as a unified construct, focus on financial and innovation outcomes, or include digital transformation as a mediator. There has been a limited simultaneous focus on the four dimensions of capabilities, experience, predictability and vision in relation to a workforce-capability mechanism. In particular, multidimensional digital leadership research has been suggested to look into the digital workforce capabilities as a transmission channel (Senadjki et al., 2024). Leadership-enabled business model research also focuses on managerial decisions without evaluating this path of full sustainability (Faiz et al., 2024). Therefore, the direct and mediated relationships represent new relationships within one framework in the context of Pakistani SMEs.

This is a valid model as leaders create sustainable outcomes through the influence on employees' capabilities in their daily work. Skilled and competent leaders select appropriate technologies, allocate resources, facilitate learning and eliminate barriers to adoption. While stability establishes expectations, vision links digital change to values for the long term. These inputs are transformed into process improvement, customer responsiveness and resource efficiency when employees turn them into outputs. The results of dynamic-capability evidence indicate that digitalization can enable sustainable performance where sensing, seizing and transforming activities are part of the practice. (Vo Thai et al., 2024). In addition, employee dynamic capabilities enhance

innovative behavior and performance (Al Wali et al., 2023).

The study encompasses managers in Pakistani SMEs involved in digital technologies to assist in operations, marketing, coordination, services and/or decision making. It employs a physical questionnaire of a cross section type and 523 respondents are obtained, which are taken by convenience sampling. The unit of analysis is the respondent's SME and the constructs are perceived leadership, collective workforce capability and sustainable performance. The study is not technology- or government program-specific. The findings from the international sources reveal that the readiness and environmental factors influence SME digital outcomes (Wang and Esperança, 2023), while the findings from the Pakistan sources indicate that organizational constraints affect digital value creation (Soomro et al., 2024).

The model is based on the dynamic capabilities theory. It describes how firms regenerate resources by detecting opportunities, capturing them with commitments, and adapting their routines to respond to changes in their environments (Teece, 2007). The managerial microfoundations for sensing and seizing are digital leadership capabilities, experience, predictability and vision. Digital workforce capabilities are related to reconfiguration of operations, and sustainable business performance is related to longer-term capability outcomes. In recent studies, SMEs have adopted this rationale to argue about the creation of sustainable performance through the use of digitalization and business model innovation (Valdez-Juárez et al., 2024). Digital strategy and culture also helps to develop digital competence towards sustainable competition (Al-Omush et al., 2023).

This research correlates leader-level digital qualities and workforce execution and triple-bottom-line performance in an under-studied context. It theoretically breaks apart digital leadership and considers the digital workforce capabilities as the conversion process. PLS-SEM is used to test three direct and ten indirect relationships, with data from 523 managers. In practice, it can aid SMEs in determining if poor performance is due to poor leadership skills, lack of experience, poor direction, poor vision, or a lack of readiness in their workforce. Leadership, transformation and culture are all foundational to sustainability (Asif et al., 2024), and strategic flexibility helps SMEs perform better when it comes to sustainability (Hossain et al., 2024). Digital leadership also contributes to sustainable organizational performance via technology-enabled innovation (Mahmood et al., 2024).

2. Literature Review

2.1 Theoretical Understanding

Dynamic capabilities theory is a theoretical framework that describes the ability of firms to keep up with changes in the technology and the environment. The theory does not focus on the creation of value from resources, but on managerial processes that are able to sense opportunities and threats, seize opportunities by investing and coordinating, and then transforming routines, structures, and competencies over time (Teece, 2007). This is a particularly apt view for SMEs, as their adoption of digital technologies is characterized by speed, and they are less likely to have slack resources and to make capability building choices. The recent study reveals that these three senses (sensing, seizing and transforming) affect the digitalization, business model innovation and sustainable performance of SMEs (Thai et al., 2024). In the current model, digital leadership capability, experience, predictability, and vision serve as managerial microfoundations to inform digital decisions. Digital workforce capabilities are its operational ability to take up those decisions and translate them into digitally-enabled action. Successful renewal of resources in the economic, social and environmental dimensions leads to sustainable business performance. This logic also helps shed light on mediation: direction and resources can be provided by leadership, but their impact is enriched when employees have the ability, confidence, data literacy, and collaborative practices needed to implement digital strategies (Wang et al., 2024b).

2.2 Sustainable Business Performance

Sustainability in business performance is the capacity of a business to create long-term economic benefits with social benefits and minimize environmental damage. It takes the standard metrics of sales, profit and market share, and adds in measures of employee well-being, stakeholder value, responsible resource use, emissions reduction, prevention of waste and long-term resilience. This triple-bottom-line approach is gaining traction in SME research due to the potential for digital transformation to generate efficiency gains and to have wider sustainability impacts (Melo et al., 2023). The companies that have embraced Digitization have reported a link between that and performance improvements in environmental, social and governance aspects, provided that technology is associated with innovation capabilities and value creation through service (Chen & Wang, 2024). Research also indicates that digital strategy and digital capability can enhance sustainable competitive performance by facilitating responsiveness and resource deployment (Al-Omush et al., 2023). But, sustainment is not guaranteed. Poorly managed digitalization can lead to higher energy consumption, more intensive work or higher inequality, which is why the leadership and skills of the workforce must be able to channelize the technology toward a balance of stakeholder goals. For SMEs survival, local employment, community legitimacy and efficient use of scarce resources are closely related, and sustainable business performance is particularly important. It consequently offers a comprehensive dependent variable that can be used to assess the outcome of digital leadership, in terms of resilient and responsible organizational value.

2.3 Digital Workforce Capabilities

Digital workforce capabilities are the knowledge, skills, confidence, adaptability and collaborative practices that allow workers to use digital technologies effectively. These include data literacy, platform proficiency, virtual coordination, digital problem solving, cybersecurity awareness, and proficiencies to learn new tools. Workforce capability differs from technology – and the ability to use the technology in everyday tasks and to constantly enhance processes. Research on digital workplaces confirms that technological infrastructure needs to be supported by leadership buy-in and employee preparedness to maximize performance (Chatterjee et al., 2023a). Employee dynamic capabilities also foster innovative work behavior and performance by allowing employees to notice changes, learn, and adapt their behavior (Al Wali et al., 2023). From a sustainability point of view, it's possible to digitally capable personnel to reduce material waste, improve energy monitoring, enhance the accessibility of services, facilitate transparent reporting and coordinate the response of stakeholders. Digital workforce capabilities are thus anticipated to convert leadership intent into economic, social and environmental outcomes.

2.4 Digital Leadership Capabilities

Digital leadership competencies are the skills of a leader to identify, mobilize and coordinate technological, human and organizational resources for digital transformation. These include technological awareness, strategic decision making, orchestration of resources, facilitation of change and facilitation of experimentation. Effective digital leaders aren't just those who approve the acquisition of technology, they are also able to connect digital projects to business priorities and eliminate structural obstacles to implementation. The ability to lead in digital is correlated to better digital workplace performance (Chatterjee et al., 2023a) and highlighted as a key element to ensure that technological investments bear fruit. Studies on new businesses also indicate that the application of digital leadership skills positively affects business model innovation by enhancing managerial decision processes (Faiz et al., 2024). In SMEs, these skills can be particularly beneficial as the leaders may hold more control over resources and employee training. Digital leadership capabilities should boost workforce readiness and sustainable business performance

through technology coordination and alignment to sustainability goals.

2.5 Digital Leadership Experience

Digital leadership experience is the actual learning that has taken place about digital projects, how to manage it using technology, making decisions based on data, and what challenges that's created. Over time, leaders begin to see trends, assess for potential risks, choose practical solutions and learn from previous failures. It also acts as a conduit for the implicit knowledge of employee and customer reactions to digital transformation. Research on digitalization of SMEs suggests that learning and organization accumulated experience affect the adoption quality and performance outcomes (Kallmuenzer et al., 2025). The tenure of leaders and their experience of transformation have also been found to influence the digital leadership and sustainability of SMEs (Imran et al., 2025). In companies that are struggling with resources, experienced leaders can focus on high value initiatives, the sequence of change, and offer convincing coaching during times of uncertainty. The experience may then help them to strengthen digital workforce skills, such as speeding up learning and establishing confidence. It should also enable sustainable business performance by focusing scarce resources on technologies and routines that demonstrate economic, social and environmental worth.

2.6 Digital Leadership Predictability

Digital leadership predictability is the constant, predictable and transparent nature of the digital decision making and actions of digital leaders. Clear leaders articulate clear priorities, establish clear rules and stick to the agreed-upon commitments for technology, data, training and process change. This quality is not stolid or inflexible, but rather it eliminates needless uncertainty, and still retains the ability to bend or flex. Digital organizations, with their inconsistent messages and changing priorities, can have a negative impact on trust, adoption and help employees cling on to familiar processes. Studies on digital transformation highlight the necessity of having consistent roadmaps, governance, and continuous improvement for the success of SMEs (Kahveci, 2025). Organizational culture and leadership alignment also play a role in determining the sustainability of the digital transformation outcome (Asif et al. 2024). Predictability can then enhance workforce capacity by fostering a mindset to learn and a predictable setting to put skills into practice. It could also enhance sustainable business performance by minimizing implementation waste, lack of coordination and making decisions that are short-term and do not align with sustainable long-term objectives.

2.7 Digital Leadership Vision

Digital leadership vision is a clear and credible picture of what digital technology will look like in the firm's future, strategy, value proposition, work system and the relationships between the firm and its stakeholders. A great vision links the use of technology to meaningful organizational goals, and also assists workers understand how important change is. The role of vision is of great significance in SMEs, for formal planning systems can be very limited and the direction of the owner manager can make a big difference in regards to resource commitments. Digital awareness, strategy, adoption, and continuous improvement, are aspects that are identified as mutually reinforcing in successful SME transformation (Kahveci, 2025). Digital orientation can also enable smaller companies to align investments and build a culture of commitment to transformation (Barragan & Becker, 2025). By integrating sustainability principles into the digital vision, employees can connect new tools efficiently, inclusively, transparently and sustainably. A digital vision should, therefore, inspire capability development, act as a thread that ties together disparate projects, and help to support sustainable business performance by focusing transformation on the longer-term economic, social, and environmental value.

2.8 Hypothesis Development

There is a general empirical basis for the proposed relationships in recent evidence. Artificial intelligence research indicates that technology-based capabilities generate value by complementing other organizational resources and enhanced service configurations (Abou-Foul et al., 2023; Shleha et al., 2023). There is a link between responsible management and multidimensional performance and the participation in circular economy and the financial strategy sensitivity on ESG (Baah et al., 2023; Ramírez-Orellana et al., 2023). The connection between enterprise digitization and digital transformation and better ESG results has been observed in organizational environments (Fang et al., 2023; Lu et al., 2024). The sustainability value generated by digital transformation (DT) can be impacted by environmental regulations and earnings-management conditions (Li et al., 2024; Wang & Hou, 2024). The importance of digital abilities for responsible performance has also been found in international studies and research in the field of green finance, such as a recent study by Khurram et al. (2024) and Rashid et al. (2025) on digital challenges and opportunities in Pakistan's SMEs. Additionally, open innovation and digital finance also play a positive role in enterprise value and ESG performance (Luan & Wang, 2023; Mu et al., 2023). There are several drivers of transformation revealed by machine learning, and resource mismatching can be mitigated by digitalization (Chen et al., 2024; Wu et al., 2024). Organizations that have the right factors playing their part in digital transformation also see benefits in productivity (Ding et al., 2024; Zhao et al., 2024). The impact of digitalization on family-firm internationalization and systematic evidence suggest that leadership and capabilities are key enablers of digital entrepreneurship (Chatterjee et al., 2023b; Berman et al., 2023). The PLS-SEM assessment is conducted according to the standards of reporting and discriminant-validity (Henseler et al., 2015; Hair et al., 2019).

Digital leadership competencies help the leaders of small and medium-sized enterprises (SMEs) define technologies that are helpful, map investments to strategy, and strategically direct limited resources in a responsible way to create value. Research on digital workplace indicates that enhancing leadership capability leads to better performance values gained from digital work arrangements (Chatterjee et al., 2023a). Moreover, the manufacturing organizations provide evidence that sustainable organizations can be created by combining leadership with digital transformation (Asif et al., 2024). When SME leaders actively engage in mobilizing people and resources, digital leadership also contributes to SMEs' innovation and transformation outcomes (Imran et al., 2025). Dynamic-capability research indicates that digitalization, if done in a coordinated way, can enhance the sustainable economic, social and environmental performance (Vo Thai et al., 2024). The process of forming digital capability is also shown to be a mechanism whereby strategic digital action generates long-term effects in the research on sustainable competitive performance (Al-Omush et al., 2023). Thus, the proposal is made that H1 be the hypothesis.

H1: Digital leadership capabilities positively influence sustainable business performance.

Experienced leaders will be able to identify fad technology from technology that's relevant to the strategic mission and will be able to invest in the right sequence that will preserve the valuable limited resources of an SME. Research on digitalization of SMEs indicates that lessons learned from previous digitalization and organizational experience positively affect the performance of the SMEs (Kallmuenzer et al., 2025). Digital transformation effectiveness of leadership tenure also varies and this impacts SME sustainability (Imran et al., 2025). Through experience, leaders know when to invest, change, and cancel digital programs and projects (Bhandari et al., 2023), which helps with orchestrating resources. When leaders integrate technological knowledge and capability development, it also promotes service innovation and ESG performance (Chen & Wang, 2024). Digital transformation research indicates that the accumulation of organizational knowledge leads to

any organization's responsiveness and value creation in the long term (Sagala & Ori, 2024). So, H2 is suggested.

H2: Digital leadership experience positively influence sustainable business performance.

A predictable digital leadership fosters certainty about priorities, investments, how the data is to be used, employee roles and responsibilities, and implementation timelines. A good SME transformation framework highlights the importance of roadmaps and constant governance for ongoing digital advancements (Kahveci, 2025). Digital orientation studies also indicate that clear strategic orientation helps SMEs coordinate transformation processes and enhance their performance (Barragan & Becker, 2025). Consistency can also help minimize implementation waste and resistance, helping to achieve efficiency along with environmental and social goals. Research on the relationship between corporate culture, transformation and leadership suggests that when managers act in alignment, their actions are found to be impacting on the sustainability outcomes (Asif et al., 2024). Under conditions of uncertainty, firms can better reconfigure resources by making predictable strategic decisions (Wang et al., 2024a). Moreover, the findings of the paradoxical leadership indicate that the balance between stability and change has a positive effect on sustainable performance of SMEs (Hossain et al., 2024). Thus, H3 is proposed.

H3: Digital leadership predictability positively influence sustainable business performance.

A vision of digital leadership provides a shared understanding of the role of technology in the firm's future to employees and stakeholders. Digital leadership research suggests that visionary direction enhances the quality of digital transformation by connecting technology to the business strategy (Senadjki et al., 2024). Research on SME growth also indicates that strategic leaders who view digital transformation positively have a positive impact on sustainability (Imran et al., 2025). Digital orientation research shows that a clear future orientation is needed for SMEs to coordinate and build long-term commitment (Barragan & Becker, 2025). Combining strategic digitalization with increased sustainable competitive performance has been associated with how it influences firmwide capability development (Al-Omush et al., 2023). In addition, business model research confirms that digitally aware leadership facilitates innovation and sustainability (Faiz et al., 2024). A sustainable digital vision should consequently focus on sustainable and balanced results. Therefore it is suggested that the model H4 is proposed.

H4: Digital leadership vision positively influence sustainable business performance.

Leaders who put in place tools, training, experimentation, feedback and cross-functional learning opportunities will foster digital capability in the workforce. Studies of digital workplaces reveal that leadership capability supports the connection between digital work systems and organizational performance by facilitating employees' adaptation (Chatterjee et al., 2023a). The digital leadership capability also enables the coordination of technical and human resources for the digitization and innovation of platforms (Benitez et al., 2022). Research on high-involvement human resource practices suggests that employee dynamic competencies develop when managers promote proactivity, learning and participation (Wang et al., 2024b). The research results of the business model innovation also indicate that the improvement of decision processes or mobilizing resources is a benefit from digital leaders (Faiz et al., 2024). In SMEs, where the formal support functions are limited, the leaders directly affect whether the employees have the opportunities to develop digital skills (Leso et al., 2023). Therefore, it is suggested that H5 is recommended.

H5: Digital leadership capabilities positively influence digital workforce capabilities.

Tacit knowledge of experienced digital leaders helps them to navigate the learning curve of the technologies they introduce, identify potential areas of resistance and understand how to create confidence for the staff. The analysis of the evidence on digital transformation in SMEs reveals that the more learning that is accumulated,

the more the organization will be able to integrate technologies and build complementary capacities (Kallmuenzer et al., 2025). The tenure of leadership and digital transformation experience also affects the effectiveness of embedding digital agenda into SMEs (Imran et al., 2025). The research of dynamic capability of employees shows that there is a positive relationship between learning opportunities and adaptive behavior or innovative behavior and managerial support (Al Wali et al., 2023). Digital workplace research also highlights that the capability of employees is not just about technology, it's about leadership, too (Chatterjee et al., 2023a). The studies of organizational culture and SME transformation reveal that previous changes experience facilitates leaders to establish supportive learning environment (Leso et al., 2023). Therefore, it is suggested that H6 be considered.

H6: Digital leadership experience positively influence digital workforce capabilities.

When leaders' expectations, priorities, and support are consistent and reliable, employees are more likely to put in the effort to engage in digital learning. Predictable digital leadership helps to make clear what skills are important, how things should be used, and if things will be rewarded or punished when experimenting. The transformation research of SMEs emphasizes on the need for coherent roadmap and governance for ongoing capability development (Kahveci, 2025). Digital orientation also helps to strengthen common commitment to transformation priorities, as they become understandable and consistent (Barragan & Becker, 2025). Research on organizational culture reveals that leadership behavior that aligns with the technology is positively related to technology related learning and sustainable change (Asif et al., 2024). The study of employee capability shows that good management practices reinforce adaptive behavior and performance (Wang et al., 2024b). Lastly, contrary to conventional leadership studies, a balance between stability and flexibility is crucial because it enables SMEs to become ambidextrous and adaptable (Hossain et al., 2024). Hence, it is suggested that the proposed name is H7.

H7: Digital leadership predictability positively influence digital workforce capabilities.

If technology is correlated with improvements in the value of products and services for future customers, more efficient operations, improved jobs and environmental responsibility, employees can view digital development as something meaningful, not burdensome. In research on the dimensions of digital leadership, vision is one of the elements which is considered as a component of strategic transformation and performance (Senadjki et al., 2024). The digital orientation studies conducted among SMEs indicate that a common future focus helps to coordinate the adoption and organizational learning (Barragan & Becker, 2025). Analogously, digital transformation frameworks focus on awareness and strategy prior to the actual transformation process (Kahveci, 2025). Research on digital leadership and SME growth has indicated that direction helps to enhance the transformation process and sustainability outcomes (Imran et al., 2025). Digital workplace studies also show that leadership alignment is a key factor in enabling employees to leverage technology into effective skills (Chatterjee et al., 2023a). Therefore, it is suggested that H8 be established.

H8: Digital leadership vision positively influence digital workforce capabilities.

Digital workforce capabilities enable the workers to leverage data, platforms, automation, and communication technologies to increase productivity and added value to stakeholders. The dynamic capabilities of employees strengthen innovative behavior and job performance, according to research (Al Wali et al., 2023). Digital and creative skills also enhance company's performance and enable specific corporate social responsibility strategies (Bui & Le, 2023). Research on digitalization of SMEs indicates that complementary organizational capabilities are required for technology to lead to lasting improvements in performance (Kallmuenzer et al., 2025). Digital capability is also seen as a mediating variable between two variables of digital strategy and culture to sustainable competitive performance (Al-Omush et al., 2023). A study

conducted in Pakistan by Soomro et al. (2024) reveals that economic and social value can emerge with the effective use of digital technologies by organizational users. Thus, the hypothesis that H9 was proposed.

H9: Digital workforce capabilities positively influence sustainable business performance.

2.8.1 Digital Workforce Capabilities

Digital leadership capacities create the strategic and organizational framework for transformation, but the conditions need to be sustainable, which requires that employees can put them into action. Dynamic capabilities theory proposes that when the manager senses and seizes the opportunity, that action should be followed by the reconfiguration of the operations to create lasting results (Teece, 2007). Digital workplace research reveals that leaders who have developed capabilities help their employees to leverage digital systems to boost performance (Chatterjee et al., 2023a). The findings from the employee dynamic-capability evidence suggests that adaptability in the workforce is important for innovation and performance (Wang et al., 2024b). Research on digital capability reveals that it is a mechanism for the diffusion of the effects of digital strategy to sustainable competitiveness (Al-Omush et al., 2023). There is also research that explores the link between digital transformation and ESG performance, which also highlights capability-based implementation (Chen & Wang 2024). As a result, the impact of the capabilities of digital workforce should be part and parcel of the impact of the capabilities of leadership for sustainable business performance; thus, H10 should be supported by digital workforce capabilities.

H10: Digital workforce capabilities mediate relationship between digital leadership capabilities and sustainable business performance

The experience, however, should be shared and become part of the routine of employees if it is to become an organizational asset. SME research on digitalization indicates that the accumulated learning facilitates the performance when it is transformed into repeatable capabilities (Kallmuenzer et al., 2025). Leadership tenure has a significant impact on the outcome of transformation because the more experienced the leader is, the more effective he or she can be in leading organizational learning (Imran et al., 2025). Workers can then leverage their managerial knowledge into dynamic tasks and markets through employee dynamic capabilities (Al Wali et al., 2023). Resource-orchestration evidence shows the value of managerial experience is in the way the resources are deployed and recombined and not just in having them (Bhandari et al, 2023). Additionally, research on digital workplace also correlates leadership guidance to effective use of technology (Chatterjee et al., 2023a). Thus, digital workforce capabilities are expected to mediate the experience–performance relationship, supporting H11.

H11: Digital workforce capabilities mediate relationship between digital leadership experience and sustainable business performance

Predictable digital leadership resolves the uncertainty but if that predictability isn't equated with competent action from employees, it won't boost sustainable performance. SME transformation frameworks highlight the need to achieve continuous improvement and capability accumulation, which is facilitated by consistent governance (Kahveci, 2025). Digital orientation research also demonstrates that if there is common strategic direction, then the quality of adoption will be better (Barragan & Becker, 2025). Organizational culture and leadership alignment enables sustainability through the normalization of transformation priorities (Asif et al., 2024). Adaptive routines and employee initiative have been proven to convert management systems into performance through workforce dynamic-capability studies (Wang et al., 2024b). Additionally, paradoxical leadership research indicates that the combination of stable structures and strategic flexibilities are complementary and they contribute to sustainable SME outcomes (Hossain et al., 2024). Digital workforce capabilities must then be able to predictably lead to reliable, efficient, and responsible execution. Therefore, H12 is suggested.

H12: Digital workforce capabilities are significant in bridging the gap between digital leadership predictability and sustainable business performance.

Digital leadership vision is a vision of a desired future, but without the ability of the employees to make that vision a reality, then it has no impact on sustainability. Studies revealing digital leadership suggest that vision plays a crucial role in strategic changes and company performance (Senadjki et al., 2024). Based on SME digital orientation studies, there is a greater support for coordinated capability development, when there is a shared future direction. Workforce and organizational competencies to drive firms into sustainable outcomes of their competitive success are supported by digital capability research (Al-Omush et al., 2023). The findings from the dynamic-capabilities evidence of the Vietnamese SMEs reveal that digitalization strategies affect the sustainable performance through dynamic-capabilities (Vo Thai et al., 2024). Studies on sustainable digital transformation also emphasize the need to integrate technology into organizational resources and processes (Melo et al., 2023). Hence, the vision–performance relationship is hypothesized to be mediated by digital workforce capabilities that boost H13.

H13: Digital workforce capabilities partially bridge the link between digital leadership vision and sustainable business performance.

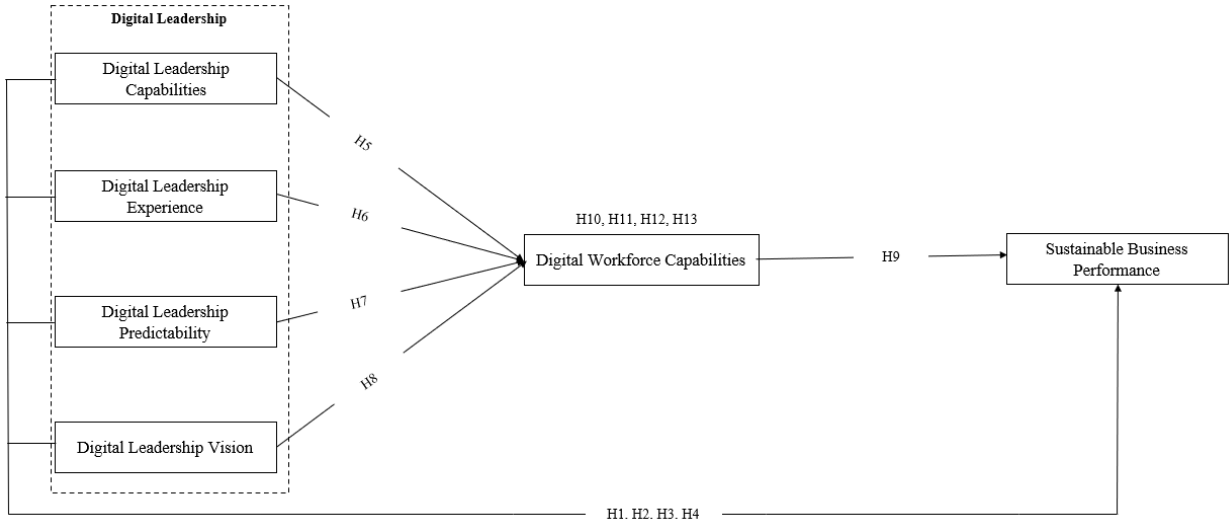


Figure 1: Theoretical Framework

3. Research Methodology

This study used a quantitative, explanatory and cross-sectional research design to test the proposed relationships between the dimensions of digital leadership, digital workforce capabilities and sustainable business performance. Managers of Pakistani SMEs were chosen as the target population as they have pertinent information regarding leadership practices, preparedness of employees and organizational outcomes. The data were collected using a structured questionnaire, which was administered physically. Given that a complete sampling frame of SME managers was not available and direct access to eligible respondents was inconsistent across the firms and locations, convenience sampling was chosen. All participants were asked to answer questions, and they were assured that their responses would be treated as confidential and used for academic purposes to minimize evaluation apprehension. Questionnaires which were returned were screened for completeness and quality of return, and a total of 523 good questionnaires were retained for analyses. The PLS-SEM was chosen because the model was comprised of multiple latent constructs, direct and indirect relationships

simultaneously, and the prediction-oriented objective. There were two stages to the analysis. The first line of evaluation was the measurement model which was assessed by indicator reliability, internal consistency, convergent validity, discriminant validity, and collinearity diagnostics. Second, the structural model was evaluated using bootstrapped path estimates, significance testing, explained variance, effect sizes, predictive relevance and specific indirect effects. The reporting of PLS-SEM was in accordance with the guidelines for reporting complex management models (Hair et al., 2022).

3.1 Measures

All constructs were assessed with multi-item reflective scales with 5-point Likert response format from 1 (strongly disagree) to 5 (strongly agree). The items were modified to suit the Pakistani context of SMEs and translated to the organizational level. Digital leadership competencies reflected the leader's understanding of digital technologies, the ability to mobilize resources, to coordinate change and to solve technology-based business challenges. Digital leadership experience measured total exposure to digital projects, implementation learning and confidence from previous transformation initiatives. Digital leadership predictability was defined by the consistency, reliability, transparency and follow-through of digital decisions. Digital leadership vision measured the clarity, credibility, future focus and alignment to sustainability of the firm's digital direction. These four dimensions were drawn from recent multidimensional digital-leadership research done by Senadjki et al. (2024). Digital workforce capabilities assessed the combined digital literacy, data literacy, digital platform usage, digital collaboration, problem solving, adaptability and technology learning capacity of employees. It contains items based on the research on employees' dynamic capabilities (Chatterjee et al., 2023a; Wang et al., 2024b) in the digital workplace. Operationalization of sustainable business performance occurred through the perceived economic, social and environmental outcomes, such as efficiency, growth resilience, employee and stakeholder value, responsible resource use and environmental improvement.

3.2 Data Analysis

Partial least squares structural equation modeling (PLS-SEM) was used to assess the model. Analysis should be done in two steps: First, measurement model is evaluated using outer loadings, Cronbach's alpha, composite reliability, average variance extracted, and Fornell-Larcker criterion. Second, the structural model is assessed by the collinearity of the variables, the path coefficients, the significance of the path coefficients (bootstrap t-values and path confidence intervals), the explanatory power of the model, the magnitude of the path coefficients (effect sizes), the indirect effects, and the interaction terms (Hair et al., 2019, 2022; Nitzl et al., 2016). To minimize common-method concerns, item blocks are recommended to be separated into their own procedure and clear wording is recommended; full-collinearity checks can be used as a diagnostic (Kock, 2015; Podsakoff et al., 2003).

4. Results

4.1 Measurement Model

The reliability and validity results are displayed in Table 2. For every observed variable, the outside loadings are measured. According to the results, all of observed variables have outer loadings greater than 0.70 (Hair et al., 2019). Both composite reliability and Cronbach's alpha assess how effectively latent components are measured by observable variables (Hair et al., 2019). The reliability is confirmed by all values being greater than 0.70. When AVE is examined for convergent validity, all constructs meet the threshold, or are over 0.50, indicating no validity problems.

Table 2: Measurement Model Results

Latent Variables	Code	Outer Loading	Cronbach's Alpha	Composite Reliability	Average Variance Extracted
Threshold		*> 0.70*	*> 0.70*	*> 0.70*	*> 0.50*
Digital Leadership Capabilities	DLC1	0.786	0.834	0.836	0.601
	DLC2	0.754			
	DLC3	0.776			
	DLC4	0.786			
	DLC5	0.775			
Digital Leadership Experience	DLE1	0.770	0.888	0.889	0.599
	DLE2	0.789			
	DLE3	0.722			
	DLE4	0.775			
	DLE5	0.796			
	DLE6	0.776			
	DLE7	0.790			
Digital Leadership Predictability	DLP1	0.802	0.871	0.873	0.607
	DLP2	0.772			
	DLP3	0.803			
	DLP4	0.781			
	DLP5	0.747			
	DLP6	0.769			
Digital Leadership Vision	DLV1	0.733	0.859	0.865	0.587
	DLV2	0.737			
	DLV3	0.756			
	DLV4	0.774			
	DLV5	0.785			
	DLV6	0.807			
Digital Workforce Capabilities	DWC1	0.788	0.846	0.851	0.620
	DWC2	0.777			
	DWC3	0.762			
	DWC4	0.772			
	DWC5	0.834			
Sustainable Business Performance	SUP1	0.779	0.881	0.886	0.585
	SUP2	0.801			
	SUP3	0.741			
	SUP4	0.792			
	SUP5	0.765			
	SUP6	0.700			
	SUP7	0.779			

Discriminant validity was tested to establish whether the latent constructs were empirically distinguishable from one another. Following Hair et al. (2019), the Fornell-Larcker criterion was investigated. According to the Fornell-Larcker criterion, the square root of the average variance recovered for each construct, as shown on the diagonal, exceeded the corresponding inter-

construct correlations. As presented in Table 3, all constructs satisfied this requirement, confirming discriminant validity.

Table 3: Discriminant Validity

Constructs	DLC	DLE	DLP	DLV	DWC	SUP
Digital Leadership Capabilities (DLC)	0.776					
Digital Leadership Experience (DLE)	0.141	0.774				
Digital Leadership Predictability (DLP)	0.191	0.184	0.779			
Digital Leadership Vision (DLV)	0.241	0.115	0.175	0.766		
Digital Workforce Capabilities (DWC)	0.382	0.380	0.376	0.323	0.787	
Sustainable Business Performance (SUP)	0.334	0.336	0.362	0.378	0.528	0.765

3.2 Structural Model

To evaluate possible multicollinearity amongst the predictor constructs, the variance inflation factor (VIF) was investigated. Multicollinearity was not an issue in the structural model since all VIF scores were below the suggested cutoff of 3.3 (Hair et al., 2019). Decisions for hypothesis testing were made using the appropriate t-statistics and p-values shown in Table 4. A link was deemed statistically significant for a two-tailed test at 5% significance level if the absolute t-value was greater than 1.96 and the p-value was less than 0.05 (Haenlein & Kaplan, 2004). Accordingly, hypotheses meeting these criteria were considered supported, whereas those failing to meet them were considered unsupported. H1 proposed that digital leadership capabilities positively influence sustainable business performance, which is accepted as β= 0.118, t value= 2.972, with p < 0.002. H2 discussed that digital leadership experience positively influence sustainable business performance, which is accepted as β= 0.153, t value= 4.224, with p < 0.000. H3 depicted that digital leadership predictability positively influence sustainable business performance, which is accepted as β= 0.164, t value= 4.583, p < 0.000. H4 is showing that digital leadership vision positively influence sustainable business performance, which is accepted as β= 0.207, t value= 5.055, with p < 0.000. H5 proposed that digital leadership capabilities positively influence digital workforce capabilities, which is accepted as β= 0.251, t value= 6.545, with p < 0.000. H6 discussed that digital leadership experience positively influence digital workforce capabilities, which is accepted as β= 0.278, t value= 7.200, with p < 0.000. H7 depicted that digital leadership predictability positively influence digital workforce capabilities, which is accepted as β= 0.244, t value= 6.249, p < 0.000. H8 is showing that digital leadership vision positively influence digital workforce capabilities, which is accepted as β= 0.188, t value= 5.301, with p < 0.000. H9 is showing that digital workforce capabilities positively influence sustainable business performance, which is accepted as β= 0.296, t value= 6.820, with p < 0.000. Figure 2 also depicts the results of structural hypotheses.

Table 4: Structural Model Results

No.	Hypotheses	β	T value	P values	VIF	Effect size (f^2)	Confidence interval		Decision
							2.5%	97.5%	
H1	DLC → SUP	0.118	2.972	0.002	1.195	0.019	0.056	0.187	Accept
H2	DLE → SUP	0.153	4.224	0.000	1.172	0.032	0.093	0.215	Accept
H3	DLP → SUP	0.164	4.583	0.000	1.174	0.037	0.105	0.224	Accept
H4	DLV → SUP	0.207	5.055	0.000	1.141	0.061	0.146	0.277	Accept
H5	DLC → DWC	0.251	6.454	0.000	1.098	0.089	0.186	0.318	Accept
H6	DLE → DWC	0.278	7.200	0.000	1.052	0.114	0.214	0.339	Accept
H7	DLP → DWC	0.244	6.249	0.000	1.082	0.086	0.180	0.309	Accept
H8	DLV → DWC	0.188	5.301	0.000	1.086	0.050	0.126	0.245	Accept
H9	DWC → SUP	0.296	6.820	0.000	1.548	0.092	0.228	0.371	Accept
Mediation Analysis									
H10	DLC→DWC→SUP	0.074	4.527	0.000	-	-	0.050	0.102	Accept
H11	DLE→DWC→SUP	0.082	4.772	0.000	-	-	0.054	0.109	Accept
H12	DLP→DWC→SUP	0.072	4.497	0.000	-	-	0.050	0.103	Accept
H13	DLV→DWC→SUP	0.056	4.399	0.000	-	-	0.036	0.077	Accept

Where; DLC- Digital Leadership Capabilities, DLE- Digital Leadership Experience, DLP- Digital Leadership Predictability, DLV- Digital Leadership Vision, DWC- Digital Workforce Capabilities, SUP- Sustainable Business Performance.

Mediation analysis is performed to examine the mediating role of digital workforce capabilities. H10 is depicted that digital workforce capabilities mediate relationship between digital leadership capabilities and sustainable business performance, which is accepted and showing partial mediation as β= 0.074, t value= 4.527, p < 0.000, lower confidence interval (LCI) = 0.050 and upper confidence interval (UCI) = 0.102. H11 showed that digital workforce capabilities mediate relationship between digital leadership experience and sustainable business performance, which is accepted and showing partial mediation as β= 0.082, t value= 4.772, p < 0.000, LCI = 0.054 and UCI = 0.109. H12 proposed that digital workforce capabilities mediate relationship between digital leadership predictability and sustainable business performance, which is accepted and showing partial mediation as β= 0.072, t value= 4.497, p < 0.000, LCI = 0.050 and UCI = 0.103. H13 discussed that digital workforce capabilities mediate relationship between digital leadership vision and sustainable business performance, which is accepted and showing partial mediation as β= 0.056, t value= 4.399, p < 0.000, LCI = 0.036 and UCI = 0.077. Table 4 showing the mediation analysis results.

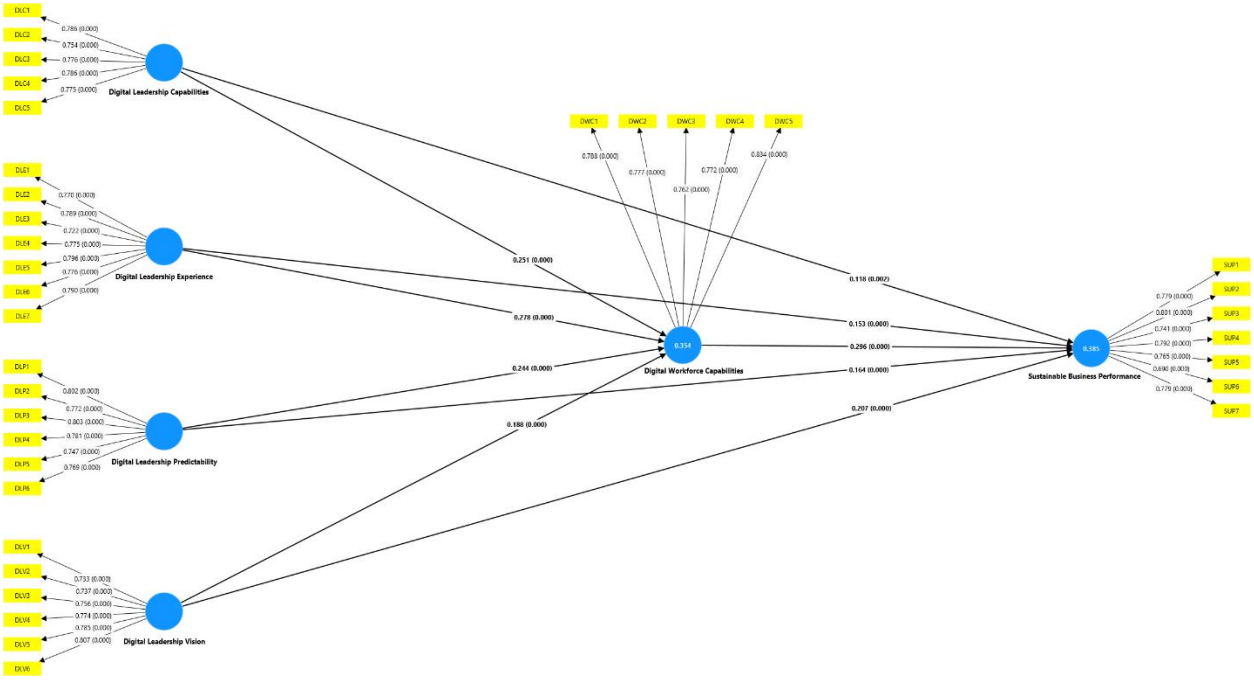


Figure 2: Hypothesis Testing

5. Discussion

All four digital leadership dimensions positively contributed to sustainable business performance, providing support for H1–H4. Capabilities serve to garner resources, experience helps with judgment, predictability helps with implementation, and vision helps with long-term value. The findings are a continuation of the multidimensional evidence of digital leadership in the economic, social and environmental consequences of SMEs in Pakistan (Senadjki et al., 2024). It is in line with studies which found that digital leadership enhances transformation and sustainability of SMEs (Imran et al., 2025). Leadership, digital transformation, and culture also work hand-in-hand to enhance the sustainability of the companies (Asif et al., 2024). Sustainable performance of SMEs in technological change can also be contributed by leadership that is aware of paradox and strategic flexibility (Hossain et al., 2024).

Every leadership dimension contributes to digital workforce capabilities, which is demonstrated by the acceptance of H5–H8. By providing resources, coaching and consistency, learning, and a clear future direction, SME leaders are able to impact workplace readiness. This corroborates the evidences that digital workplace performance is a function of digital leadership capability (Chatterjee et al., 2023a). In addition, high-involvement management practices can also improve the dynamic capabilities of employees and their digital performance (Wang et al., 2024b). The transformation is a key success within SMEs that is rooted in organizational culture and leadership arrangements (Leso et al., 2023). Sustained capability development is also supported by coherent roadmaps, adoption and continuous improvement phases (Kahveci, 2025). As H9 was accepted, which indicates that digital workforce capabilities enhances sustainable business performance. Employees are digitally capable and work with data and platforms, and collaborate to boost efficiency, responsiveness, transparency and resource conservation. The latter is correlated with the employees' dynamic capabilities, which in turn are linked to their innovative behaviour and performance (Al-Wali et al., 2023). The relevance of digital and creative capacities in terms of corporate social

responsibility strategies, which are differentiated, is also relevant to firm performance (Bui & Le, 2023). The benefits of SME digitalization are more pronounced when technology is complemented by other skills and processes (Kallmuenzer et al., 2025). Studies from Pakistan also indicate that digital adoption can generate economic and social value if companies are ready to use technologies in a productive manner (Soomro et al., 2024).

H10–H13 were accepted, thereby connecting all the leadership dimensions to sustainable performance through digital workforce capabilities. This discovery is consistent with the theory of dynamic capabilities, which argues that managerial sensing and seizing needs to involve the reconfiguration of operations for enduring outcomes (Teece, 2007). Digital capability has also been demonstrated to transfer digital strategy and culture to sustainable competitiveness (Al-Omush et al., 2023). The findings from Vietnamese SME evidence suggest that digitalization and dynamic capabilities are not only positively associated with each other but also contribute to a better innovation and sustainable performance (Vo Thai et al., 2024). The presence of innovation capability and mechanism also contributes to enhancing ESG outcomes during the process of digital transformation (Chen & Wang, 2024). The mediation outcomes provide an insight into why there can be varying sustainability results from similar technology investments for SMEs.

These findings are given greater significance in the Pakistani context due to the severe resource constraints and the critical role of leadership decisions and learning capacities of the workforce. The findings align with the findings of Haq et al. (2023) which found that digital strategy influences environmental performance via digitalization of the organization in Pakistani SMEs. They are also consistent with the research on digital transformation and market and ESG performance (Wang & Esperança, 2023), ESG improvement and corporate performance (Zhao & Cai, 2023), and sustainable transformation based on service (Luo & Liu, 2024). Resource-orchestration research has warned of the need to understand how technologies and capabilities are structured to understand the benefits that can be gained (Bhandari et al., 2023).

6. Theoretical Implications

The study broadens the scope of dynamic capabilities theory by articulating a cascading process at the workplace from the digital micro foundations of leaders to the operational capability of the workforce and sustainable business outcomes. Digital leadership is not a single entity; it shows that there are four components to digital leadership that are all interrelated: capabilities, experience, predictability, and vision that support sensing, seizing and transforming activities. To mediate leadership within routines, the accepted mediation relationships recognize digital workplace skills as the reconfiguration pathway that creates economic, social and environmental value. This contribution responds to the call for a shift away from technology adoption and towards understanding the complementary capabilities that account for the different outcomes of SMEs (Sagala & Ori, 2024). It also builds on the previous models which mediated between digital transformation or innovation that indicated that the employee level digital readiness is a separate explanatory mechanism. Last, the Pakistan context expands the applicability of dynamic capabilities research by showing that capability formation by leadership is as relevant in contexts of limited resources, infrastructure differences, and institutional uncertainty.

7. Practical Implications

The general managerial confidence is not the right measure for assessing digital leadership for the SMEs of Pakistan. General managerial confidence is not the right measure for assessing digital leadership for SMEs of Pakistan as it involves four lenses of digital leadership. Technical and change management capabilities, implementation experience, digital governance and a vision that aligns technology and sustainability – these are all characteristics that leaders require. Companies need to convert these leadership traits into capability within the workforce, via tailored

training, peer learning, cross-functional digital projects, protected experimentation time, and data use transparency. Digital problem solving, learning agility and collaborative platform use should be recognized in the recruitment and promotion process. As workforce capability is a mechanism for all four leadership effects, it is important to invest in the development of employees, in addition to technology investments in hardware or software, in technology budgets. SME associations and public agencies can contribute to this agenda by providing low-cost, digital-leadership training, access to joint training facilities, and sector specific toolkits and mentoring networks. In addition, managers should track economic, social and environmental indicators in tandem, and determine the productivity, value to employees and customers, efficiency in using resources and future sustainability of digital initiatives.

8. Limitations and Future Research Recommendations

There are some limitations to this study. As a cross-sectional study, it only provides a snapshot view of relationships, and is unlikely to provide definitive evidence on temporal causality; longitudinal studies are needed to explore how leadership and workforce skills evolve over time. Convenience sampling provided better access to SME managers, however, may bring some limitations on representativeness; future research should be based on stratified or probability sampling by province, sector and firm size. Common method and social-desirability bias exists with self-reported measures, and future studies may include both manager and employee surveys, digital-use data, sustainability reporting, or audited performance data. The model views sustainable business performance as a holistic result and future investigations might study the economic, social and environmental aspects individually. Comparative research might compare the relationships for family and non-family SMEs, between manufacturing and service companies, between women-led and other SMEs, or between companies of varying digital maturity. Other moderators or mediators might also be digital culture, environmental dynamism, government support, cybersecurity capability or artificial intelligence readiness in future models.

9. Conclusion

This study examined the relationships between the digital workforce capabilities and sustainable business performance in SMEs of Pakistan, and how the digital leadership capabilities, digital leadership experience, digital leadership predictability, and digital leadership vision influence these relationships. Data from questionnaires, with a total of 523 managers, and the analysis of PLS-SEM accepted all thirteen hypotheses. All four leadership dimensions increased sustainable business performance and the digital workforce capabilities, and the latter directly contributed to the sustainable business performance. The mediation outcomes also demonstrated that workforce capability is a key mediating mechanism between digital direction and economic, social and environmental outcomes for leaders. The results are consistent with the dynamic capabilities perspective, which argues that both strategic sensing and strategic seizing is accompanied by operational reconfiguration. Finally, digital transformation is not just about the technology that SMEs have to buy. It is a structured organizational process in which leaders are competent, provide learning, are consistent, and are visionary and employees become competent in using digital tools in a productive and responsible manner. The study presents a new integrated model appropriate to an emerging-economy SME environment and provides a sound managerial message: sustainable digital performance demands to invest in multi-dimensional digital leadership and skill simultaneously. Those Pakistani SMEs that match these two capability levels are more likely to achieve the three cardinal points of resilience, stakeholder value, and responsible long-term growth.

REFERENCES

Abou-Foul, M., Ruiz-Alba, J. L., & López-Tenorio, P. J. (2023). The impact of artificial intelligence capabilities on servitization: The moderating role of absorptive capacity—A dynamic capabilities perspective. *Journal of Business Research, 157*, 113609.

Al-Omush, A., Momany, M. T., Hannoon, A., & Anwar, M. (2023). Digitalization and sustainable competitive performance in small–medium enterprises: A moderation mediation model. *Sustainability, 15*(21), 15668.

Al Wali, J., Muthuveloo, R., Teoh, A. P., & Al Wali, W. (2023). Disentangling the relationship between employees' dynamic capabilities, innovative work behavior and job performance in public hospitals. *International Journal of Innovation Science, 15*(2), 368–384.

Asif, M., Yang, L., & Hashim, M. (2024). The role of digital transformation, corporate culture, and leadership in enhancing corporate sustainable performance in the manufacturing sector of China. *Sustainability, 16*(7), 2651.

Baah, C., Agyabeng-Mensah, Y., Afum, E., & Kumi, C. A. (2023). Do circular economy practices accelerate CSR participation of SMEs in a stakeholder-pressured era? A network theory perspective. *Journal of Cleaner Production, 394*, 136348.

Barragan, K. E., & Becker, F. S. R. (2025). Keeping pace with the digital transformation—Exploring the digital orientation of SMEs. *Small Business Economics, 64*, 1361–1385.

Benitez, J., Arenas, A., Castillo, A., & Esteves, J. (2022). Impact of digital leadership capability on innovation performance: The role of platform digitization capability. *Information & Management, 59*(2), 103590.

Berman, T., Stuckler, D., Schallmo, D., & Kraus, S. (2023). Drivers and success factors of digital entrepreneurship: A systematic literature review and future research agenda. *Journal of Small Business Management, 61*, 1–29.

Bhandari, K. R., Zámborský, P., Ranta, M., & Salo, J. (2023). Digitalization, internationalization, and firm performance: A resource-orchestration perspective on new OLI advantages. *International Business Review, 32*(4), 102135.

Bui, M.-T., & Le, H.-L. (2023). Digital capability and creative capability to boost firm performance and formulate differentiated CSR-based strategy. *Heliyon, 9*(3), e14241.

Chatterjee, S., Chaudhuri, R., Vrontis, D., & Giovando, G. (2023a). Digital workplace and organization performance: Moderating role of digital leadership capability. *Journal of Innovation & Knowledge, 8*(1), 100334.

Chatterjee, S., Chaudhuri, R., Vrontis, D., & Maalaoui, A. (2023b). Internationalization of family business and its performance: Examining the moderating role of digitalization and international networking capability. *Review of Managerial Science, 17*, 2443–2470.

Chen, D., & Wang, S. (2024). Digital transformation, innovation capabilities, and servitization as drivers of ESG performance in manufacturing SMEs. *Scientific Reports, 14*, 24516.

Chen, Q. A., Zhao, X., Zhang, X., Jiang, Z., & Wang, Y. (2024). Driving forces of digital transformation in Chinese enterprises based on machine learning. *Scientific Reports, 14*, 6177.

Ding, X., Sheng, Z., Appolloni, A., Shahzad, M., & Han, S. (2024). Digital transformation, ESG practice, and total factor productivity. *Business Strategy and the Environment, 33*, 1–18.

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Faiz, M., Sarwar, N., Tariq, A., & Memon, M. A. (2024). Mastering digital leadership capabilities for business model innovation: The role of managerial decision-making and grants. *Journal of Small Business and Enterprise Development, 31*(3), 574–597.

Fang, M., Nie, H., & Shen, X. (2023). Can enterprise digitization improve ESG performance? *Economic Modelling, 118*, 106101.

Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2022). *A primer on partial least squares structural equation modeling (PLS-SEM) (3rd ed.)*. Sage.

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review, 31*(1), 2–24.

Haq, I. U., Huo, C., Zhang, X., Chu, A. M. Y., & Gligor, D. M. (2023). Digital strategy and environmental performance: The mediating role of digitalization in SMEs. *Digital Economy and Sustainable Development, 1*, 10.

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science, 43*, 115–135.

Hossain, M. I., Kumar, J., Islam, M. T., & Valeri, M. (2024). The interplay among paradoxical leadership, Industry 4.0 technologies, organisational ambidexterity, strategic flexibility and corporate sustainable performance in manufacturing SMEs of Malaysia. *European Business Review, 36*(5), 639–669.

Imran, M., Abdul Hamid, R., & ul Haque, A. (2025). Driving SME growth through digital leadership: Exploring tenure and transformation dynamics. *Administrative Sciences, 15*(3), 104.

Kahveci, E. (2025). Digital transformation in SMEs: Enablers, interconnections, and a framework for sustainable competitive advantage. *Administrative Sciences, 15*(3), 107.

Kallmuenzer, A., Mikhaylov, A., Chelaru, M., & Czakon, W. (2025). Adoption and performance outcome of digitalization in small and medium-sized enterprises. *Review of Managerial Science, 19*, 2011–2038.

Khurram, M. U., Abbassi, W., Chen, Y., & Chen, L. (2024). Outward foreign investment performance, digital transformation, and ESG performance: Evidence from China. *Global Finance Journal, 60*, 100963.

Leso, B. H., Cortimiglia, M. N., & Ghezzi, A. (2023). The contribution of organizational culture, structure, and leadership factors in the digital transformation of SMEs: A mixed-methods approach. *Cognition, Technology & Work, 25*(1), 151–179.

Li, J., Wu, T., Liu, B., & Zhou, M. (2024). Can digital transformation enhance corporate ESG performance? The moderating role of dual environmental regulations. *Finance Research Letters, 62*, 105241.

Lu, Y., Xu, C., Zhu, B., & Sun, Y. (2024). Digitalization transformation and ESG performance: Evidence from China. *Business Strategy and the Environment, 33*(2), 352–368.

Luan, X., & Wang, X. (2023). Open innovation, enterprise value and the mediating effect of ESG. *Business Process Management Journal, 29*(2), 489–504.

Luo, S., & Liu, J. (2024). Enterprise service-oriented transformation and sustainable development driven by digital technology. *Scientific Reports, 14*, 10047.

Mahmood, G., Khakwani, M. S., Zafar, A., & Abbas, Z. (2024). Impact of digital transformation and AI through fostering digital leadership excellence: A focus on sustainable organizational performance. *Journal of Accounting and Finance in Emerging Economies, 10*(1), 33–48.

Melo, I. C., Queiroz, G. A., Alves Junior, P. N., Sousa, T. B., Yushimito, W. F., & Pereira, J. (2023). Sustainable digital transformation in small and medium enterprises (SMEs): A review on performance. *Heliyon, 9*(3), e13908.

Mu, W., Liu, K., Tao, Y., & Ye, Y. (2023). Digital finance and corporate ESG. *Finance Research Letters, 51*, 103426.

Ramírez-Orellana, A., Martínez-Victoria, M., García-Amate, A., & Rojo-Ramírez, A. A. (2023). Is the corporate financial strategy in the oil and gas sector affected by ESG dimensions? *Resources Policy, 81*, 103303.

Rashid, S., Ejaz, S., Alwadi, B. M., Kumar, A., Ejaz, F., & Hossain, M. B. (2025). Linking financial technology, innovation, and green finance to drive sustainable performance of SMEs of Pakistan. *International Journal of Business Innovation and Research, 38*(6), 30–54.

Sagala, G. H., & Ori, D. (2024). Toward SMEs digital transformation success: A systematic literature review. *Information Systems and e-Business Management, 22*, 667–719.

Senadjki, A., Au Yong, H. N., Ganapathy, T., & Ogbeibu, S. (2024). Unlocking the potential: The impact of digital leadership on firms' performance through digital transformation. *Journal of Business and Socio-economic Development, 4*(2), 161–177.

Shleha, W., Vaillant, Y., & Vendrell-Herrero, F. (2023). Entry mode diversity and closing commercial deals with international customers: The moderating role of advanced servitization. *International Business Review, 32*(1), 102053.

Soomro, R. B., Memon, S. G., Dahri, N. A., Al-Rahmi, W. M., Aldriwish, K., Salameh, A. A., Al-Adwan, A. S., & Saleem, A. (2024). The adoption of digital technologies by small and medium-sized enterprises for sustainability and value creation in Pakistan: The application of a two-staged hybrid SEM-ANN approach. *Sustainability, 16*(17), 7351.

Teece, D. J. (2007). Explicating dynamic capabilities: The nature and microfoundations of sustainable enterprise performance. *Strategic Management Journal, 28*(13), 1319–1350.

Valdez-Juárez, L. E., Ramos-Escobar, E. A., Hernández-Ponce, O. E., & Ruiz-Zamora, J. A. (2024). Digital transformation and innovation, dynamic capabilities to strengthen the financial performance of Mexican SMEs: A sustainable approach. *Cogent Business & Management, 11*(1), 2318635.

Vo Thai, H.-C., Hong-Hue, T.-H., & Tran, M.-L. (2024). Dynamic capabilities and digitalization as antecedents of innovation and sustainable performance: Empirical evidence from Vietnamese SMEs. *Journal of Asia Business Studies, 18*(2), 385–411.

Wang, B., Ma, M., Zhang, Z., & Li, C. (2024a). How do the key capabilities of the industrial internet platform support its growth? A longitudinal case study based on the resource orchestration perspective. *Technological Forecasting and Social Change, 200*, 123186.

Wang, G., Mansor, Z. D., & Leong, Y. C. (2024b). Unlocking digital performance: Exploring the mediating role of employee competitive attitudes, behaviors, and dynamic capabilities in Chinese SMEs under high-involvement human resource management practice. *Journal of Innovation and Entrepreneurship, 13*, 37.

Wang, L., & Hou, S. (2024). The impact of digital transformation and earnings management on ESG performance: Evidence from Chinese listed enterprises. *Scientific Reports, 14*, 783.

Wang, S., & Esperança, J. P. (2023). Can digital transformation improve market and ESG performance? Evidence from Chinese SMEs. *Journal of Cleaner Production, 419*, 137980.

Wu, K., Liu, S., Zhu, M., & Qu, Y. (2024). The impact of digital transformation on resource mismatch of Chinese listed companies. *Scientific Reports, 14*, 9011.

Zhao, X., & Cai, L. (2023). Digital transformation and corporate ESG: Evidence from China. *Finance Research Letters, 58*, 104310.

Zhao, X., Chen, Q. A., Zhang, H., Chen, P., & Chen, S. (2024). A study on the influencing factors of corporate digital transformation: Empirical evidence from Chinese listed companies. *Scientific Reports, 14*, 6243.

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