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DIGITAL LEADERSHIP AND ENTREPRENEURIAL INNOVATION: EVIDENCE FROM SMALL AND MEDIUM ENTERPRISES

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Abstract: The accelerating pace of digital transformation has repositioned leadership as a critical determinant of entrepreneurial innovation, particularly within resource-constrained small and medium enterprises (SMEs). This study examines how digital leadership shapes entrepreneurial innovation by integrating strategic vision, digital capability, and innovation-oriented organizational culture. Employing a mixed-methods design, this research combines semi-structured interviews with SME leaders and a survey of 300 SMEs across retail, manufacturing, and service sectors. The findings reveal that digital leadership exerts a strong and positive influence on entrepreneurial innovation by enhancing organizational agility, knowledge sharing, customer-centric innovation, and resilience under environmental uncertainty. Empirically, SMEs characterized by high digital leadership demonstrate significantly higher innovation outputs, faster time-to-market, and superior adaptive performance compared to traditionally led firms. The qualitative evidence further uncovers how digitally oriented leaders orchestrate digital tools, collaborative cultures, and learning mechanisms to overcome structural constraints typical of SMEs. This study advances the literature by moving beyond a unidimensional view of digital leadership and empirically demonstrating its integrative role as a strategic capability that links digital transformation, innovation processes, and entrepreneurial outcomes. Practically, the findings offer actionable insights for SME owners, policymakers, and support institutions to embed digital leadership development within entrepreneurship and digitalization frameworks, thereby strengthening SME competitiveness and sustainability in the digital economy.
Keywords: Digital leadership; Entrepreneurial innovation; Small and medium enterprises (SMEs); Digital transformation; Organizational agility; Innovation performance

Abstrak: Percepatan transformasi digital telah menempatkan kepemimpinan digital sebagai faktor strategis dalam mendorong inovasi kewirausahaan, khususnya pada usaha kecil dan menengah (UKM) yang beroperasi di bawah keterbatasan sumber daya. Penelitian ini menganalisis bagaimana kepemimpinan digital memengaruhi inovasi kewirausahaan melalui integrasi visi strategis, kapabilitas digital, dan budaya organisasi yang berorientasi pada inovasi. Dengan menggunakan desain mixed-methods, studi ini mengombinasikan wawancara semi-terstruktur dengan pimpinan UKM dan survei terhadap 300 UKM di sektor ritel, manufaktur, dan jasa. Hasil penelitian menunjukkan bahwa kepemimpinan digital berpengaruh positif dan signifikan terhadap inovasi kewirausahaan melalui peningkatan kelincahan organisasi, berbagi pengetahuan, inovasi yang berorientasi pada pelanggan, serta ketahanan organisasi dalam menghadapi ketidakpastian lingkungan. Secara empiris, UKM dengan tingkat kepemimpinan digital yang tinggi menunjukkan output inovasi yang lebih besar, waktu peluncuran produk yang lebih cepat, dan kemampuan adaptasi yang lebih unggul dibandingkan

UKM dengan pola kepemimpinan tradisional. Temuan kualitatif lebih lanjut mengungkap bahwa pemimpin berorientasi digital mampu mengorkestrasi pemanfaatan teknologi digital, budaya kolaboratif, dan mekanisme pembelajaran untuk mengatasi keterbatasan struktural UKM. Kontribusi utama penelitian ini terletak pada perluasan literatur dengan melampaui pandangan unidimensional terhadap kepemimpinan digital, serta menegaskan perannya sebagai kapabilitas strategis integratif yang menghubungkan transformasi digital, proses inovasi, dan kinerja kewirausahaan. Secara praktis, hasil penelitian ini memberikan implikasi kebijakan dan manajerial bagi pelaku UKM dan pemangku kepentingan dalam merancang pengembangan kepemimpinan digital guna memperkuat daya saing dan keberlanjutan UKM di era ekonomi digital.
Kata Kunci: Kepemimpinan digital; Inovasi kewirausahaan; Usaha kecil dan menengah (UKM); Transformasi digital; Kelincahan organisasi; Kinerja inovasi

Introduction

The rapid advancement of digital technologies has fundamentally transformed the contemporary business landscape, compelling organizations to rethink traditional leadership paradigms. In this context, digital leadership has emerged as a critical capability, particularly for small and medium enterprises (SMEs) that operate under resource constraints yet face intense competitive pressures. Digital leadership refers to a leader's ability to leverage digital technologies strategically, guide organizational change, and foster innovation in digitally driven environments (Belitski & Liversage, 2019)[1]. As digital transformation becomes increasingly pervasive—evidenced by the fact that approximately 70% of organizations globally are engaged in digital transformation initiatives (Chris Angevine, 2021)[2]—the role of leaders in navigating technological disruption has become more consequential than ever.

For SMEs, digital leadership is not merely a technological concern but a strategic imperative. Digitally competent leaders enable SMEs to exploit digital tools to improve operational efficiency, enhance customer engagement, and develop innovative business models. Prior empirical evidence suggests that SMEs led by digitally adept leaders demonstrate stronger innovation capabilities and more sustainable performance outcomes (Borah et al., 2022)[3]. This highlights that digital leadership functions as an enabler of organizational learning and innovation, allowing SMEs to respond more effectively to environmental uncertainty and rapid market changes.

Entrepreneurial innovation, defined as the implementation of novel ideas, products, services, or processes that create value and sustain competitive advantage, is widely recognized as a cornerstone of SME growth and survival (Yadav et al., 2024)[4]. In highly dynamic and saturated markets, innovation allows SMEs to differentiate themselves from competitors and achieve superior financial and market performance (Thongyai & Potipiroon, 2022)[5]. However, innovation in SMEs is often constrained by limited financial resources, managerial capabilities,

1 Belitski, M., & Liversage, B. (2019). E-leadership in small and medium-sized enterprises in the developing world. Technology Innovation Management Review, 9(1), 64–74.

2 Angevine, C., Keomany, J., Thomsen, J., & Zemmel, R. (2021). Implementing a digital transformation at industrial companies. McKinsey & Company.

3 Borah, P. S., Iqbal, S., & Akhtar, S. (2022). Linking social media usage and SMEs' sustainable performance: The role of digital leadership and innovation capabilities. Technology in Society, 68, 101900

4 Yadav, U. S., Vyas, S., Kanchan, Ghosal, I., & yadav, A. K. (2024). Impact of entrepreneurial leadership, Social media, digital technology, Entrepreneurial orientation and innovation on business performance in the handicraft sector: Talent management as mediating construct. Journal of Innovation and Entrepreneurship, 13(1), 72.

5 Thongyai, K., & Potipiroon, W. (2022). How entrepreneurial leadership enhances the financial performance of small and medium enterprises: the importance of intellectual capital and innovation capabilities. ABAC Journal, 42(2), 172.

and technological infrastructure, making leadership an especially critical determinant of innovation outcomes.

The intersection between digital leadership and entrepreneurial innovation has therefore attracted growing scholarly attention. Digital leaders are uniquely positioned to cultivate an organizational climate that encourages experimentation, agility, and calculated risk-taking—key ingredients for innovation (Akbari et al., 2021)[6]. By promoting the adoption of digital platforms, data-driven decision-making, and agile work practices, digital leaders can significantly accelerate the innovation process within SMEs. Empirical evidence supports this argument; for example, (Chaniago & Chaniago, 2023)[7] demonstrates that SMEs adopting agile and digitally driven leadership practices experienced substantial reductions in time-to-market, underscoring the tangible performance benefits of digitally enabled innovation.

SMEs play a pivotal role in global economic development, accounting for nearly 90% of all businesses and more than 50% of employment worldwide (World Bank, 2021)[8]. In developing economies, SMEs are particularly vital as engines of entrepreneurship, job creation, and inclusive growth. Despite their economic significance, SMEs face persistent challenges, including limited access to finance, technological gaps, and vulnerability to external shocks. Digital transformation has increasingly been viewed as a strategic pathway to overcoming these constraints. The International Finance Corporation (IFC), (2022)[9] reports that SMEs adopting digital technologies can improve productivity by up to 30%, reinforcing the strategic importance of digital leadership in driving innovation and competitiveness.

The COVID-19 pandemic further intensified the urgency of digital transformation among SMEs, forcing many firms to rapidly adopt digital channels, remote working arrangements, and online business models. This unprecedented disruption revealed stark differences between SMEs with strong digital leadership and those without, particularly in terms of resilience and adaptive capacity. As SMEs continue to navigate the post-pandemic business environment, digital leadership is expected to play a central role in shaping entrepreneurial innovation and long-term sustainability.

Against this backdrop, this study aims to examine the relationship between digital leadership and entrepreneurial innovation in SMEs. Specifically, it seeks to analyze how digital leadership influences SMEs' innovation capabilities, identify key characteristics of effective digital leaders, and explore strategies that SMEs can adopt to strengthen digital leadership and foster a culture of innovation. By addressing these objectives, this research contributes to the growing literature on digital leadership and SME innovation while offering practical insights for entrepreneurs, managers, and policymakers. Ultimately, the study aspires to develop a conceptual and empirical foundation that supports SMEs in leveraging digital leadership as a strategic resource for sustainable growth in the digital economy.

Literature Review

Digital transformation has fundamentally reshaped how small and medium enterprises (SMEs) compete, innovate, and sustain performance, placing leadership at the center of this transformation. In this context, digital leadership has emerged as a critical capability that enables organizations to leverage digital technologies strategically while fostering entrepreneurial innovation. This literature review synthesizes key theoretical perspectives and

6 Akbari, M., Bagheri, A., Imani, S., & Asadnezhad, M. (2021). Does entrepreneurial leadership encourage innovation work behavior? The mediating role of creative self-efficacy and support for innovation. European Journal of Innovation Management, 24(1), 1-22.

7 Chaniago, H. (2023). Investigation of entrepreneurial leadership and digital transformation: Achieving business success in uncertain economic conditions. Journal of technology management & innovation, 18(2), 18-27.

8 World Bank. (2021). Small and medium enterprises (SMEs) finance. World Bank.

9 International Finance Corporation. (2022). The role of SMEs in economic development. IFC.

empirical findings on digital leadership, entrepreneurial innovation, and their interrelationship within SMEs, while identifying unresolved gaps in existing research.

Digital leadership is commonly defined as the ability of leaders to strategically leverage digital technologies to enhance organizational performance and innovation while guiding individuals and teams through digital change (Belitski & Liversage, 2019)[10]. Unlike traditional leadership, digital leadership integrates technological competence with adaptability, forward-looking orientation, and strong communication skills, enabling leaders to operate effectively in dynamic and uncertain environments (Borah et al., 2022)[11]. Digital leaders are not only users of technology but also architects of digitally enabled organizational cultures that emphasize agility, collaboration, and continuous learning.

For SMEs, digital leadership holds particular importance due to structural constraints such as limited resources, smaller organizational size, and higher vulnerability to market volatility. Leaders with digital orientation are more likely to adopt agile decision-making processes, utilize data analytics, and anticipate technological trends, thereby enhancing organizational responsiveness to changing customer demands (Yadav et al., 2024)[12]. Moreover, digital leadership emphasizes collaboration and knowledge sharing, empowering employees to experiment with new ideas and technologies—an essential condition for sustained entrepreneurial innovation (Akbari et al., 2021)[13].

Empirical studies consistently show that digital leadership significantly contributes to SME competitiveness and sustainability. SMEs led by digitally competent leaders demonstrate higher levels of technology adoption, operational efficiency, and customer engagement (Nguyen et al., 2021). Digital leadership also plays a pivotal role in shaping an innovation-oriented organizational culture, where experimentation, calculated risk-taking, and creative problem-solving are encouraged. Such environments not only enhance innovation outcomes but also improve employee commitment and retention (Sahibzada et al., 2025)[14]. Evidence from Indonesian women-led SMEs further confirms that supportive digital leadership positively influences entrepreneurial innovation by fostering skills development and openness to digital transformation (Soetikno et al., 2025)[15].

Entrepreneurial innovation itself represents a multidimensional process through which SMEs identify opportunities, mobilize resources, and implement novel products, processes, or business models to create value (Yadav et al., 2024)[16]. Opportunity recognition remains the

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12 Yadav, U. S., Vyas, S., Kanchan, Ghosal, I., & yadav, A. K. (2024). Impact of entrepreneurial leadership, Social media, digital technology, Entrepreneurial orientation and innovation on business performance in the handicraft sector: Talent management as mediating construct. Journal of Innovation and Entrepreneurship, 13(1), 72.

13 Akbari, M., Bagheri, A., Imani, S., & Asadnezhad, M. (2021). Does entrepreneurial leadership encourage innovation work behavior? The mediating role of creative self-efficacy and support for innovation. European Journal of Innovation Management, 24(1), 1-22.

14 Sahibzada, U. F., Aslam, N., Muavia, M., Shujahat, M., & Rafi-ul-Shan, P. M. (2025). Navigating digital waves: unveiling entrepreneurial leadership toward digital innovation and sustainable performance in the Chinese IT industry. Journal of Enterprise Information Management, 38(2), 474-501.

15 Soetikno, H. W., Maupa, H., & Cahyadi, H. (2025). DIGITAL ENTREPRENEURSHIP DECISIONS IN INDONESIAN WOMEN-LED SMES: AN INTEGRATED SEM OF TRANSFORMATION, SKILLS, INNOVATION, AND BEHAVIORAL INTENTION. Eastern-European Journal of Enterprise Technologies, 135(13).

16 Yadav, U. S., Vyas, S., Kanchan, Ghosal, I., & yadav, A. K. (2024). Impact of entrepreneurial leadership, Social media, digital technology, Entrepreneurial orientation and innovation on business

starting point of this process, requiring entrepreneurs and leaders to detect market gaps and emerging trends. SMEs that successfully pivoted toward digital platforms during the COVID-19 pandemic exemplify how opportunity recognition, combined with digital capabilities, can lead to accelerated innovation (Akbari et al., 2021)[17].

Resource mobilization constitutes another critical component of entrepreneurial innovation, particularly for SMEs facing financial and human capital limitations. Digital tools such as cloud computing and social media platforms allow SMEs to optimize resource utilization, reduce operational costs, and scale innovation activities more efficiently (Belitski & Liversage, 2019). Equally important is organizational culture. An innovation-supportive culture—characterized by trust, autonomy, and tolerance for failure—enables SMEs to exploit their inherent flexibility and agility, facilitating faster innovation cycles (Borah et al., 2022)[18].

Within this framework, digital leadership functions as a catalyst that integrates these innovation components. Digital leaders shape innovation-conducive cultures, strategically deploy digital technologies, and facilitate knowledge sharing across organizational boundaries. By leveraging digital platforms and data-driven insights, leaders can accelerate innovation processes and align entrepreneurial initiatives with market needs (Nguyen et al., 2021). Furthermore, digital leaders actively build strategic networks and partnerships with technology providers, research institutions, and other firms, expanding SMEs' access to external knowledge and resources (Chaniago & Chaniago, 2023)[19].

The relationship between digital leadership and entrepreneurial innovation is therefore both direct and indirect. Directly, digital leadership influences innovation through technology adoption, process digitalization, and data-driven decision-making. Indirectly, it enhances innovation by strengthening organizational culture, employee capabilities, and collaborative networks (Yadav et al., 2024)[20]. Effective change management further amplifies this relationship, as digital leaders guide employees through technological transitions by providing training, clear communication, and psychological support, thereby reducing resistance and sustaining innovation momentum (Thongyai & Potipiroon, 2022)[21].

A growing body of empirical evidence supports this relationship. Nguyen et al. (2021)[22] demonstrate that SMEs led by digitally oriented leaders exhibit superior innovation performance. Borah et al., (2022)[23] show that digital leadership enhances sustainable SME

performance in the handicraft sector: Talent management as mediating construct. Journal of Innovation and Entrepreneurship, 13(1), 72.

17 Akbari, M., Bagheri, A., Imani, S., & Asadnezhad, M. (2021). Does entrepreneurial leadership encourage innovation work behavior? The mediating role of creative self-efficacy and support for innovation. European Journal of Innovation Management, 24(1), 1-22.

18 Borah, P. S., Iqbal, S., & Akhtar, S. (2022). Linking social media usage and SME's sustainable performance: The role of digital leadership and innovation capabilities. Technology in Society, 68, 101900.

19 Chaniago, H. (2023). Investigation of entrepreneurial leadership and digital transformation: Achieving business success in uncertain economic conditions. Journal of technology management & innovation, 18(2), 18-27.

20 Yadav, U. S., Vyas, S., Kanchan, Ghosal, I., & yadav, A. K. (2024). Impact of entrepreneurial leadership, Social media, digital technology, Entrepreneurial orientation and innovation on business performance in the handicraft sector: Talent management as mediating construct. Journal of Innovation and Entrepreneurship, 13(1), 72.

21 Thongyai, K., & Potipiroon, W. (2022). How entrepreneurial leadership enhances the financial performance of small and medium enterprises: the importance of intellectual capital and innovation capabilities. ABAC Journal, 42(2), 172.

22 Nguyen, P. V., Huynh, H. T. N., Lam, L. N. H., Le, T. B., & Nguyen, N. H. X. (2021). The impact of entrepreneurial leadership on SMEs' performance: the mediating effects of organizational factors. Heliyon, 7(6).

23 Borah, P. S., Iqbal, S., & Akhtar, S. (2022). Linking social media usage and SME's sustainable performance: The role of digital leadership and innovation capabilities. Technology in Society, 68, 101900.

performance through innovation capabilities, while Yadav et al. (2024)[24] highlight the mediating role of digital technology in the relationship between entrepreneurial leadership and innovation. Similarly, Thongyai & Potipiroon, (2022)[25] emphasize that leadership-driven innovation capabilities are essential for improving SME financial performance.

Despite these advances, several research gaps remain. First, existing studies often treat digital leadership as a unidimensional construct, offering limited insight into how specific leadership behaviors and competencies influence different types of innovation, such as product, process, or business model innovation (Akbari et al., 2021)[26]. Second, contextual factors—such as industry characteristics, regional environments, and organizational culture—are insufficiently examined, limiting the generalizability of prior findings (Chaniago & Chaniago, 2023)[27]. Third, empirical evidence on the role of digital leadership in enhancing SME resilience and adaptability during crises remains scarce, despite its heightened relevance following the COVID-19 pandemic (Soetikno et al., 2025)[28]. Finally, few studies address the challenges and barriers SMEs face in implementing effective digital leadership, including skill gaps, resistance to change, and resource constraints (Thongyai & Potipiroon, 2022)[29].

Addressing these gaps is essential for advancing theoretical and practical understanding of how digital leadership drives entrepreneurial innovation in SMEs. By integrating leadership, innovation, and digital transformation perspectives, future research can provide more nuanced insights into how SMEs can sustain competitiveness and growth in an increasingly digital economy.

Methods

This study employs a mixed-methods research design to examine the relationship between digital leadership and entrepreneurial innovation in small and medium enterprises (SMEs). The mixed-methods approach is particularly appropriate for investigating complex organizational phenomena, as it enables the integration of in-depth contextual insights with statistically generalizable evidence. As argued by (Cresswell & Plano Clark, 2017)[30], mixed methods research provides a comprehensive framework for understanding multifaceted constructs such

[24] Yadav, U. S., Vyas, S., Kanchan, Ghosal, I., & yadav, A. K. (2024). Impact of entrepreneurial leadership, Social media, digital technology, Entrepreneurial orientation and innovation on business performance in the handicraft sector: Talent management as mediating construct. Journal of Innovation and Entrepreneurship, 13(1), 72.

[25] Thongyai, K., & Potipiroon, W. (2022). How entrepreneurial leadership enhances the financial performance of small and medium enterprises: the importance of intellectual capital and innovation capabilities. ABAC Journal, 42(2), 172.

[26] Akbari, M., Bagheri, A., Imani, S., & Asadnezhad, M. (2021). Does entrepreneurial leadership encourage innovation work behavior? The mediating role of creative self-efficacy and support for innovation. European Journal of Innovation Management, 24(1), 1-22.

[27] Chaniago, H. (2023). Investigation of entrepreneurial leadership and digital transformation: Achieving business success in uncertain economic conditions. Journal of technology management & innovation, 18(2), 18-27.

[28] Soetikno, H. W., Maupa, H., & Cahyadi, H. (2025). DIGITAL ENTREPRENEURSHIP DECISIONS IN INDONESIAN WOMEN-LED SMES: AN INTEGRATED SEM OF TRANSFORMATION, SKILLS, INNOVATION, AND BEHAVIORAL INTENTION. Eastern-European Journal of Enterprise Technologies, 135(13).

[29] Thongyai, K., & Potipiroon, W. (2022). How entrepreneurial leadership enhances the financial performance of small and medium enterprises: the importance of intellectual capital and innovation capabilities. ABAC Journal, 42(2), 172.

[30] Cresswell, J. W., & Plano Clark, V. L. (2017). Designing and conducting mixed method research. 2nd Sage. Thousand Oaks, CA, 520. https://books.google.com/books/about/Designing_and_Conducting_Mixed_Methods_R.html?hl=fi&id=-LvwjwEACAAJ

as leadership and innovation, especially within dynamic and heterogeneous organizational settings like SMEs.

The qualitative component was designed to capture SME leaders' lived experiences and perceptions regarding digital leadership practices and their influence on innovation. Semi-structured interviews were conducted with owner-managers and senior decision-makers, allowing flexibility to explore emerging themes while maintaining conceptual consistency across interviews. This phase played a critical exploratory role by uncovering underlying mechanisms, contextual factors, and behavioral patterns that informed the subsequent quantitative phase. Such sequential integration enhances methodological robustness and supports meaningful triangulation of findings (Fetters et al., 2013)[31].

Complementing the qualitative inquiry, the quantitative phase aimed to empirically test the relationship between digital leadership practices and entrepreneurial innovation outcomes across a broader SME population. A structured survey was administered to SMEs operating in diverse sectors, including technology, retail, and manufacturing, ensuring sectoral heterogeneity. Stratified sampling was applied to enhance representativeness and mitigate sectoral bias. Given the economic significance of SMEs—accounting for 99.9% of all U.S. businesses and nearly half of private-sector employment (Small Business Administration & of Advocacy, 2021)[32]—this sampling strategy strengthens the external validity of the study.

Data collection instruments were developed based on established and validated measures to ensure construct validity and comparability with prior research. The survey incorporated items adapted from the Digital Leadership Assessment (DLA) and the Innovation Capability Measurement (ICM), both of which have been widely applied in studies on digital transformation and innovation management (Kane et al., 2015)[33]. Prior to full deployment, the survey and interview protocols were pilot-tested with a small group of SME leaders to refine wording, ensure clarity, and enhance content validity.

The qualitative data were analyzed using thematic analysis, following the procedures outlined by (Braun & Clarke, 2006)[34]. Interview transcripts were systematically coded to identify recurring patterns related to strategic vision, technological competence, and innovation-oriented leadership behaviors. To enhance credibility, member checking was conducted, allowing participants to review and validate the interpreted themes (Lincoln & Guba, 1985)[35]. Inter-coder reliability was further ensured by involving multiple researchers in the coding process and resolving discrepancies through discussion.

Quantitative data analysis proceeded in several stages. Descriptive statistics were first used to summarize respondent characteristics and organizational profiles. Subsequently, inferential analyses—including correlation and multiple regression—were conducted to examine the strength and direction of relationships between digital leadership and innovation outcomes. All analyses were performed using SPSS, a statistical package widely recognized for social science research (Pallant, 2020)[36]. Instrument reliability was assessed using Cronbach's alpha, with

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31 Fetters, M. D., Curry, L. A., & Creswell, J. W. (2013). Achieving integration in mixed methods designs—principles and practices. Health services research, 48(6pt2), 2134-2156.

32 U.S. Small Business Administration. (2021). Small business economic profile. https://www.sba.gov/advocacy/small-business-economic-profile

33 Kane, G. C., Palmer, D., Phillips, A. N., & Kiron, D. (2015). Is your business ready for a digital future?. MIT Sloan management review, 56(4), 37.

34 Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. Qualitative Research in Psychology, 3(2), 77–101.

35 Lincoln, Y. S., & Guba, E. G. (1985). Naturalistic inquiry. SAGE Publications.

36 Pallant, J. (2020). SPSS survival manual: A step by step guide to data analysis using IBM SPSS. Routledge.

values exceeding the recommended threshold of 0.70 indicating acceptable internal consistency (Tavakol & Dennick, 2011)[37]. Construct validity was further evaluated through exploratory factor analysis to confirm alignment between measurement items and theoretical constructs.

Overall, this integrated methodological approach enables a nuanced and empirically grounded examination of how digital leadership shapes entrepreneurial innovation in SMEs. By combining qualitative depth with quantitative rigor, the study not only identifies statistically significant relationships but also elucidates the mechanisms through which digital leadership practices translate into innovative outcomes. This methodological rigor enhances the study's contribution to the literature on digital leadership and SME innovation, while offering actionable insights for practitioners and policymakers.

Results And Discussions

This study investigates how digital leadership influences entrepreneurial innovation within small and medium enterprises (SMEs), a sector that plays a dominant role in emerging economies. Drawing on survey data collected from 300 SMEs across retail, manufacturing, and service sectors, this research provides empirical evidence on the strategic importance of digital leadership in fostering innovation capacity. With a response rate of approximately 75%, the dataset is considered robust and representative. The relevance of focusing on SMEs is reinforced by World Bank data indicating that SMEs account for nearly 90% of global businesses and contribute substantially to employment and GDP, particularly in developing economies ("IFC Financing to Micro, Small, and Medium Enterprises in the Poorest Countries," 2024)[38].

The demographic composition of respondents reflects sectoral diversity, with 40% operating in retail, 30% in manufacturing, and 30% in services. Notably, 60% of the surveyed SMEs reported adopting digital tools within the last three years, signaling an accelerated digital transformation trajectory. This trend aligns with (Mauliansyah, 2024)[39], who emphasized that digital adoption is no longer optional but a strategic necessity for maintaining competitiveness in increasingly digitalized markets.

Analysis of the data reveals several interrelated mechanisms through which digital leadership enhances entrepreneurial innovation. First, adaptability emerges as a central theme. SMEs led by digitally competent leaders demonstrate a stronger capacity to reconfigure business models in response to market volatility. This finding supports the argument of (Sahibzada et al., 2025)[40], who underline that entrepreneurial leadership significantly strengthens firms' responsiveness and innovation under dynamic environmental conditions.

Second, knowledge sharing functions as a critical enabler of innovation. Leaders who actively promote open communication and collaborative work environments foster an organizational culture conducive to experimentation and creativity. This result is consistent with Al

37 Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. International journal of medical education, 2, 53.

38 IFC Financing to Micro, Small, and Medium Enterprises in the Poorest Countries. (2024). IFC Financing to Micro, Small, and Medium Enterprises in the Poorest Countries. https://doi.org/10.1596/42041

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40 Sahibzada, U. F., Aslam, N., Muavia, M., Shujahat, M., & Rafi-ul-Shan, P. M. (2025). Navigating digital waves: unveiling entrepreneurial leadership toward digital innovation and sustainable performance in the Chinese IT industry. Journal of Enterprise Information Management, 38(2), 474-501

Hawamdeh and Al-Edenat (2025)[41], who identify digital organizational culture as a mediating variable linking leadership and innovation outcomes. In digitally led SMEs, technology serves not merely as an operational tool but as an infrastructure for continuous learning and idea exchange.

Third, customer-centric innovation is significantly reinforced by digital leadership. SMEs increasingly leverage digital platforms to collect customer insights and translate them into innovative products and services. Evidence from the survey indicates that SMEs utilizing social media analytics and digital engagement tools are better positioned to align offerings with evolving consumer preferences. This finding corroborates Anam & Mauliansyah, (2025)[42], who document how culinary SMEs use social media to stimulate product innovation and strengthen customer relationships.

Empirically, the impact of digital leadership on innovation performance is substantial. SMEs characterized by strong digital leadership report innovation outputs approximately 30% higher than those led by traditional leadership models. Furthermore, SMEs that implemented e-commerce and digital distribution platforms experienced an average sales increase of 25%, illustrating how digital leadership simultaneously drives innovation and financial performance. These results reinforce Mauliansyah's (2024)[43] assertion that digital strategy is a key source of sustainable competitive advantage for SMEs.

Digital leadership also enhances organizational agility. SMEs adopting agile practices under digitally oriented leadership demonstrate faster prototyping, experimentation, and market entry. This agility enables firms to respond effectively to technological disruption and shifting customer expectations, thereby sustaining long-term innovation performance.

Case-based evidence further illustrates these dynamics. A retail SME that transitioned to an omnichannel business model under digital leadership achieved a 15% increase in market share within one year by integrating online and offline customer experiences. Similarly, a manufacturing SME adopting Industry 4.0 technologies—such as IoT and artificial intelligence—reduced production costs by 40% while improving product quality, highlighting the efficiency-innovation nexus enabled by digital leadership. In the service sector, SMEs leveraging data analytics developed new service lines that increased revenue by 20%, underscoring the strategic value of data-driven innovation.

Comparative analysis strengthens these findings. SMEs led by digitally proficient leaders consistently outperform their counterparts in innovation metrics, including product development frequency and speed to market. On average, high digital leadership SMEs launch three new products annually, compared to only one among SMEs with low digital leadership. Additionally, digitally led SMEs are more likely to engage in collaborative innovation through partnerships with technology firms and participation in innovation ecosystems, echoing the conclusions of Sahibzada et al. (2025)[44].

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41 Al Hawamdeh, N., & Al-Edenat, M. (2025). Digital leadership and frugal innovation: the mediating role of knowledge sharing and the moderating role of digital organisational culture. International Journal of Innovation Science, 1-24.

42 Anam, B. S., & Mauliansyah, H. (2025). DIGITAL MARKETING STRATEGIES FOR CULINARY MSMEs THROUGH TIKTOK AND INSTAGRAM. Global Research in Economics and Advanced Theory (GREAT), 2(2), 44-55.

43 MAULIANSYAH, H. (2024). ANALYSIS OF MSME COMPETITIVE STRATEGIES IN FACING DIGITAL COMPETITION. Global Research in Economics and Advance Theory (GREAT), 1(1), 1-14.

44 Sahibzada, U. F., Aslam, N., Muavia, M., Shujahat, M., & Rafi-ul-Shan, P. M. (2025). Navigating digital waves: unveiling entrepreneurial leadership toward digital innovation and sustainable performance in the Chinese IT industry. Journal of Enterprise Information Management, 38(2), 474-501.

Implications, Limitations, and Future Research

The findings confirm a strong and positive relationship between digital leadership and entrepreneurial innovation in SMEs. From a practical perspective, SMEs should prioritize the development of digital leadership capabilities through targeted training and leadership development programs. Cultivating a digital culture that emphasizes knowledge sharing, agility, and customer orientation is equally critical.

For practitioners, adopting a proactive digital leadership approach involves leveraging digital tools for strategic decision-making, empowering employees to participate in innovation processes, and forming strategic alliances with technology providers. These practices enhance both innovation capacity and organizational resilience.

Despite its contributions, this study has limitations. The cross-sectional design restricts causal inference, and reliance on self-reported data may introduce response bias. Additionally, the sample may not fully capture regional and sectoral heterogeneity among SMEs.

Future research should employ longitudinal designs to examine the long-term effects of digital leadership on innovation sustainability. Comparative studies across cultural and regulatory contexts would also deepen understanding of how external environments shape the effectiveness of digital leadership.

Research Contribution

This study addresses a key research gap by empirically integrating digital leadership and entrepreneurial innovation within the SME context. While prior studies have examined these constructs separately, this research offers a comprehensive framework linking leadership, digital culture, and innovation outcomes. By providing both theoretical and practical insights, this study contributes to the growing literature on digital transformation and offers actionable guidance for SMEs navigating the digital economy.

Conclusion

This study provides consolidated evidence that digital leadership plays a decisive role in fostering entrepreneurial innovation among small and medium enterprises (SMEs). The findings consistently demonstrate that digitally capable leadership significantly enhances SMEs' innovation capacity, operational performance, and organizational resilience. Empirical evidence indicates that SMEs led by digitally proficient leaders achieve substantially higher innovation adoption rates, confirming that leadership quality—particularly digital competence—functions as a strategic enabler rather than a peripheral organizational attribute (Hamza & Karadas, 2025)[45].

Beyond innovation outcomes, digital leadership facilitates more efficient integration of digital tools into core business processes. SMEs that strategically adopt digital technologies experience notable improvements in customer satisfaction and cost efficiency, reinforcing the argument that digital leadership extends beyond technological adoption toward the orchestration of digital transformation as a business-wide strategy (Digital Economy and Society Index (DESI) 2020)[46]. These findings position digital leadership as a critical mechanism through which SMEs can simultaneously enhance market responsiveness and internal efficiency.

The study also highlights the social and organizational dimensions of digital leadership. Strong digital leadership fosters collaborative work environments that promote knowledge sharing

[45] Hamza, P., & Karadas, G. (2025). Digital Leadership, AI Integration, and Cyberloafing: Pathways to Sustainable Innovation in SMEs Within Resource-Constrained Economies. Sustainability, 17(20), 9171.

[46] European Commission. (2020). Digital economy and society index (DESI) 2020. https://ec.europa.eu

and cross-functional interaction, both of which are essential drivers of entrepreneurial innovation. SMEs characterized by digitally enabled leadership cultures are better equipped to generate novel ideas and implement innovative solutions that strengthen competitive positioning (Held et al., 2025)[47]. This relational aspect of leadership underscores the importance of aligning digital competence with participatory and innovation-oriented leadership practices.

Furthermore, the role of digital leadership becomes particularly salient during periods of uncertainty and disruption. Evidence from the COVID-19 pandemic illustrates that SMEs with established digital leadership and digital strategies were significantly more resilient, enabling them to maintain or even expand market share amid volatile conditions (McKinsey & Company, 2021)[48]. This finding reinforces the strategic value of digital leadership not only as a catalyst for innovation but also as a foundation for organizational adaptability and crisis preparedness.

An additional contribution of this study lies in emphasizing continuous learning as a core component of effective digital leadership. SMEs that invest in digital skills development for leaders and employees exhibit sustained improvements in innovation output and employee performance, highlighting that digital leadership is inherently dynamic and evolves alongside technological change (World Economic Forum (2021)[49]. Consequently, digital leadership should be conceptualized as an ongoing capability-building process rather than a static leadership trait.

From a theoretical perspective, this study extends the digital leadership and entrepreneurship literature by empirically linking leadership digital competencies with entrepreneurial innovation outcomes in the SME context. It challenges traditional leadership paradigms that prioritize managerial efficiency alone and advocates for an integrated framework that combines digital capability, innovation orientation, and organizational learning. Practically, the findings provide actionable insights for SME owners, policymakers, and support institutions to embed digital leadership development into entrepreneurship programs and business support ecosystems.

In conclusion, digital leadership emerges as a pivotal determinant of innovation, resilience, and long-term competitiveness in SMEs. As digital transformation accelerates, SMEs that prioritize digital leadership development are more likely to navigate uncertainty, leverage emerging technologies, and contribute meaningfully to economic growth. Future research would benefit from longitudinal and cross-country analyses to further examine how digital leadership capabilities evolve over time and how their sustained implementation shapes entrepreneurial performance across diverse institutional contexts.

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