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Leadership and Digital Transformation in SMEs: Evidence from a PRISMA Systematic Review

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Abstract

The understanding of the transformation process through digitization that SMEs are experiencing has rapidly become a form of research. Leadership is a key factor in determining technology adoption as well as performance outcomes. While these numbers indicative of uptake are promising, many of the reviews fail to apply PRISMA in a consistent manner and lack clear methodology. This has broader implications for transparency, replicability, and the incremental advancement of knowledge in research on the digital transformation of SMEs. To combat this tendency, the present research carries out a PRISMA-guided systematic review centred around digital transformation and SME leadership. A systematic literature review was done in major academic search database. Inclusion and exclusion criteria were detailed in advance, and records were screened accordingly. This review relied on PRISMA 2020 guidelines of identification, screening, eligibility, inclusion. Leadership behaviours, adoption factors, and reported outcomes were analyzed using a thematic synthesis. The review also finds a significant focus on studies that connect transformational, and entrepreneurial, and digital leadership and SME successful process of digital transformation. Leadership has direct and indirect effects on technology adoption via organizational agility, digital capability, and culture. In most studies these enablers are positively associated to innovation, operational efficiency and financial performance. Methodologically, studies have been largely cross-sectional with little evidence from longitudinal and mixed-method studies. Lack of clarity in PRISMA flow reports and justification for exclusions are also identified. This PRISMA checklist facilitates developing a transparent structured review for the purpose of digitally transforming and SMEs leadership research. It explains optimal methods of search design, screening, and synthesis. This will help to inform better systematic reviews and increased methodological rigor in this area. Future reviews should attempt to be more longitudinal and have better methods' reporting for purposes of theory and practice.

Keyword: Digital Transformation, SMES, Leadership, PRISMA, Systematic Review

Introduction

The importance of digital transformation as a topic of research for small and medium-sized enterprise competitiveness, innovation, and long-term performance is clear. SMEs are important to the economies of countries but are often hampered by a lack of resources, digital literacy and focus. As cloud computing, artificial intelligence, big data, and digital platforms have become pervasive in different sectors, leadership has become a critical feature in determining how SMEs adopt, integrate, and benefit from these technologies (Teng et al., 2022; Yu-ping, 2024).

Theoretical foundation of SME digital transformation research typically lies in the resource-based view, dynamic capabilities theory, and the technology-organization-environment framework. This perspective sees leadership as a major micro-level force, instrumental in the mobilization of resources, in the development of digital capabilities, and in the alignment of technology towards strategic objectives. Leadership covers the investment decisions, organizational learning, cultural readiness, and the changes in processes needed to create meaningful lasting digital transformation.

Evidence on leadership styles and managerial cognition and strategic orientation among SMEs undergoing digital transformation has grown. Transformational, entrepreneurial, and digital leadership have also been linked to greater degrees of technology adoption, organizational agility, and innovation performance even when the use of specific technologies is studied in isolation (Cui et al., 2018; Yang & Entebang, 2019; Gun et al., 2019). At the same time, research emphasizes the role of context, including organizational culture, employees' digital skills and external situational pressures in determining the outcome of transformation (Wu & Yang, 2024; Sharma, et al., 2025). These findings combined underline how the process of digital transformation in SMEs is an organizational change process that is driven from the top rather than simply a technical upgrade.

Despite the rapid growth of the literature in this area, current reviews of digital transformation and SME leadership are fragmented and uneven in terms of the methodology used. Most reviews report their findings using narrative synthesis and fail to describe the search strategy, any screening decisions or criteria used to exclude studies (Thapaliya & Adhikari, 2025; Egodawele et al., 2022). Some use parts of the systematic review process but are not entirely following PRISMA 2020 recommendations. The lack of such methodological process does not only compromise transparency and replicability but also the usefulness to increment the cumulative and theory building process around the social science literature on the digitalization process in SMEs (Barragan & Becker, 2014; Kallmuenzer et al., 2014).

The PRIMSA framework is a structured and internationally accepted methodology for the development and report of systematic reviews. It focuses usage points to be transparent in identifying, screening, evaluating eligibility and including studies. PRISMA has been widely taken up in health and social sciences, but its use in research on SME digital transformation and leadership is less consistent. Flow diagrams are often incomplete, justification for exclusions is minimal, or there is no explicit link between research questions and search strategies and synthesis methods (Arifia, 2024; Cui, 2024).

Given the rapidly expanding and methodologically heterogenous body of research on SME digital transformation, a PRISMA-inspired review that is specifically rooted in both leadership theory and social science perspectives is a necessity. This can help to enhance methodological rigor, comparability between studies and develop the understanding of the role of leadership as a central explanatory mechanism to the research of digital transformation.

This study attempts to address this gap by conducting a PRISMA based systematic review on the theme of leadership and digital transformation among SMEs. The review process is documented throughout, and the overall review consolidates empirical and theoretical evidence for the questions at hand. The novelty of this study is that it has a twofold original book contribution. Methodologically it presents a PRISMA review protocol adapted to the study of SME digital transformation, specially formulated for that purpose. In terms of content, this distillation regards the leadership-related influence, processes, outcomes and foundations of digital transformation within SMEs. This strengthens how pertinent the study is to the wider social science literature on the categories of leadership and organizational change and digital innovation.

Purpose and Scope of the Review

The objective of this study is to propose a systematic review methodology based on PRISMA, that can be used in exploring the research trends in both digital transformation and leadership in SMEs. It is hoped that the review will lead to an increase in the level of methodological transparency, consistency, and replicability in this area of research. Following PRISMA 2020 guidelines in a linear manner, the current study can be a path for future scholars interested in developing systematic reviews on the digital transformation of SMEs.

This study is grounded in leadership and organizational capability perspectives to explain how digital transformation unfolds in SMEs. This review is limited to published, peer reviewed, indexed research articles in academic databases collected in one time. This includes any studies that focus on leadership styles, manager capabilities, organizational readiness and performance outcomes related to digital transformation. Research that are conceptual and do not have a clear research design as well as research that exclusively focus on large firms are omitted to keep the review consistent with its objectives.

The specific objectives of this PRISMA guided systematic review are:

1. To illustrate the use of PRISMA 2020 guidelines in conducting a review of the literature on digital transformation and SME leadership.
2. To develop transparent inclusion and exclusion criteria to identify and screen relevant studies on digital transformation and leadership in SMEs in a systematic manner.
3. To summarize the findings in these areas of leadership, technology adoption and digital leadership outcomes for SMEs.
4. To identify methodological patterns, limitations, and reporting gaps in existing reviews and primary studies.
5. To offer a systematic review guide that can lead to better systematic review in the field of SME digital transformation.

Methodology

This study utilized a PRISMA-guided systematic review design to increase transparency, rigor, and replicability in the approach taken to synthesize the large and diverse literature on digital transformation and leadership in SMEs. This review approaches the summary search following the principles of the PRISMA 2020 guidelines, which divides the process into identification, screening, eligibility and inclusion stages. It overcomes a set of methodological limitations that remain common in management and entrepreneurship literature reviews based on ambiguous search strategies used and decisions taken with respect to which studies to include in the review (Arifia, 2024; Barragan & Becker, 2024).

Five major databases were used in this study, which are Scopus, Web of Science, Emerald, ScienceDirect, and SpringerLink. Positive Boolean search strings were prepared to account for vocabulary variations in the use possible combinations of words associated with digital transformation, SMEs, leadership and technology adoption. The search was limited to peer-reviewed journal articles and limited to the most recent years to capture relatively recent advancements in research on SME digital transformation (Teng et al., 2022; Yu-ping, 2024). Citation chaining was used to search for additional relevant studies that were not identified through the search in databases.

The search process in the identification phase resulted in a total of 1,700 references, 1,550 of which derived from the search in the databases and 150 publications from other sources. After duplicates were discarded, 1,130 unique records were identified for screening. Of these, 670 were not relevant to SMEs, did not attend to the topic of digital transformation, or did not concern leadership or managerial independent variables and were excluded during title and abstract screening. Additional searching identified 460 full-text articles that underwent eligibility assessment.

The second stage, full text screening, used pre-defined criteria of inclusion and exclusion to determine relevance to the focus of the review. These were excluded in the review process, as well as those who did not adopt a systematic method and papers that lacked methodological clarity. At this point, 410 articles were excluded for not meeting the eligibility criteria. The final sample included 50 articles specifically focusing on digital transformation and leadership within SMEs. They were used for thematic synthesis and for the appraisal of methodology (Wu & Yang 2024; Cui 2024).

Extracted data included publication details, project type and overall project description, theories used, concepts of leadership studied, types of digital technologies explored, and findings. The studies were then grouped into the major themes established in relation to the roles of leadership, the mechanisms for the adoption of technology, and outcomes of digital transformation, using thematic synthesis. Following PRISMA 2020, all review decisions were recorded in a consistent manner to reduce bias and improve replicability.

The selection process is summarized through the PRISMA flow diagram in Figure 1. This diagram traces the records excluded and included at each stage of the review process and represent a clear audit trail process of record identification, screening, exclusion, and inclusion. It shows the groups from which there is a heavy filtering process, reflecting the

rigidity in the application of the inclusion and exclusion criteria. The significant exclusions at the screening and eligibility stages highlight the scatteredness of the literature and the lack of more direct connections to themes of SME leadership and digital transformation. This helps to ensure the transferability of the reviews' findings and represents a best practice for systematic reviews conducted in the context of research on digital transformations in SMEs.

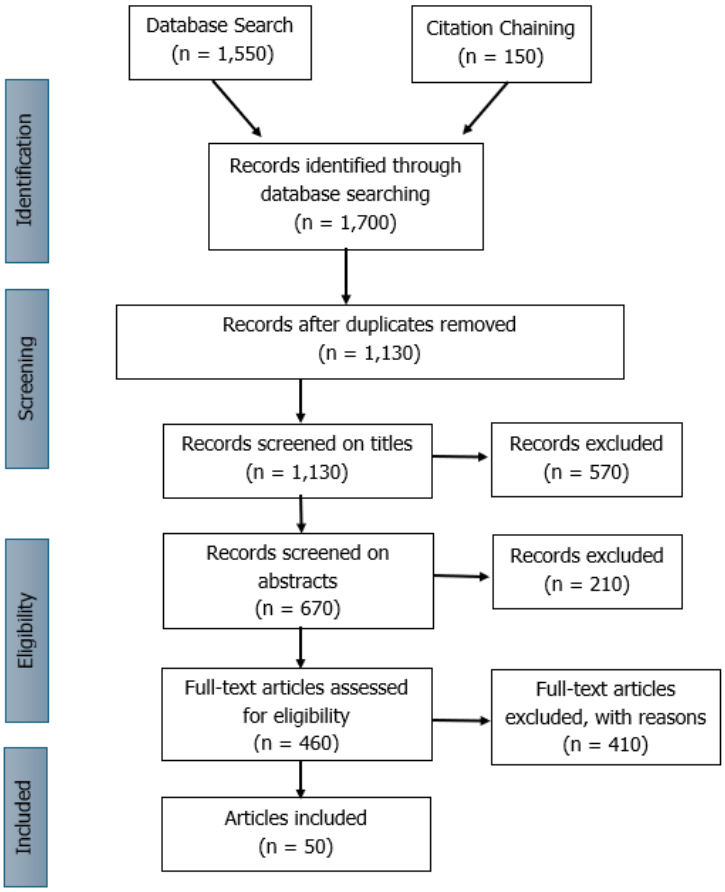

Figure 1. PRISMA Flow Diagram

Results

The PRISMA-guided review leads to the recognition of an increasing and varied set of existing papers looking into the digital transformation in SMEs from a leadership perspective. Many of the studies overlap across industry and location and have many of them located in Asia and within developing countries (Rizkita et al., 2025; Chabalala et al., 2024). These have tended towards quantitative surveys based on structural equation models, regression analysis, and configurational methods. The available studies have a clear predominance for individual correlational designs while little longitudinal or qualitative research has been conducted so far (Jia et al., 2024; Kallmuenzer et al., 2024).

The thematic synthesis of these themes uncovers leadership to be a critical force underpinning SME transition. For instance, transformational, entrepreneurial and digital forms of leadership significantly correlate with the increased adoption of technology, organizational agility and innovation, among many others (Cui et al., 2022; Gun et al., 2024; Yang & Entebang, 2024). The direct impact of leadership is primarily found at the levels of vision and resource commitment to support digital capabilities as well as at an indirect level,

dealing with the role of leadership in stimulating the development of a digital culture, capabilities and learning attitude amongst employees.

The relationship forming between leadership and digital transformation is bridged using technology. Research finds that the use of cloud systems, digital platforms, big data analytics, and artificial intelligence can enhance firms' operational efficiency, innovation performance, and financial results if enabled by effective leadership (Sharma et al., 2025; Wu & Tóth, 2025). Yet, it has been argued that there is no assurance that this would lead to actual performance improvements, especially when smaller firms lack the skills, have legacy systems and tight resources as is often the case (Xu, 2024; Luo & Zhang, 2024).

Overall, this review has demonstrated variations among existing reviews and among primary research studies in reporting the details of their search strategy, screening, and exclusion. Often, PRISMA flow diagrams are replaced with inadequate depiction, and reporting of eligibility criteria is generally insufficient. Such discrepancies compromise the ability to compare findings from different studies and to cumulatively build knowledge (Steil et al., 2022; Rico-González et al., 2022; Liberati et al., 2009). On top of that, through the detailing all stages of the review process, this research shows how PRISMA can help to overcome these issues and enhance the quality of evidence synthesis for the purpose of SME digital transformation research as well (Barragan & Becker, 2024; Cui, 2024). In general, the findings highlight the importance of leadership for digital transformation in SMEs and highlight the need for a more consistent, and rigorous application of PRISMA standards in this domain.

Table 1 provides a summary of the findings from 50 studies that present data concerning the importance of leadership to SME digitalization. The focus is on transformational, entrepreneurial, digital style of leadership as the significant factor in the promotion of technology adaptation and the change in the organization. Leadership is found to affect outputs both directly via the provision of strategic direction and resources and indirectly via digital culture, employee skills, organizational agility and learning capability. The use of technology, such as cloud solutions, AI, Big Data, and digital platforms, is a recurring central mechanism through which leadership operates towards performance. All of the studies found that innovation leads to positive outcomes in terms of performance of the firm, and in particular the operating performance and/or financial performance of the firm but a few of the studies noted that there were delayed or mixed outcomes due to lack of resources, skills and even infrastructure that is common to the SME sector. These relationships are often influenced by contextual factors such as government support, market pressure, and access to infrastructure within the regional digital environment. In sum, the results of Table 2 show that the digital transformation process in SMEs is leadership driven, and that the performance benefits derived from it are a function of the alignment between leadership style, readiness to change and the successful integration of digital technologies.

Table 1
Descriptive Summary of Empirical Studies on Leadership and Digital Transformation in SMEs

Study	Key Focus and Mechanisms	Main Outcomes and Context
Yu-ping (2024)	Leadership supports digital innovation and capability development. High digital capability adoption.	Improved sales growth and profit margins. Policy guidance supports competitiveness.
Wu & Yang (2024)	Top management involvement increases adoption willingness. Usefulness and ease of use drive adoption.	Adoption is shaped by mimetic and normative pressures. Performance not directly measured.
Bux et al. (2025)	Transformational leadership strengthens digital transformation through knowledge sharing and agility.	Greater resilience and sustainable performance in dynamic environments.
Zhang et al. (2024)	Top management support links digital capability and organizational agility.	Higher digital transformation success driven by internal factors.
Wu & Tóth (2025)	Digital leadership improves technology adoption and employee skills.	Financial performance improves. Infrastructure and policy gaps remain challenges.
Sharma et al. (2025)	Digital leadership and IT readiness enhance organizational agility.	Operational and financial gains. Market pressure and regulation matter.
Wang & Zhang (2025)	Digital culture moderates leadership impact on digital adoption and innovation.	Innovation performance improves through systemic digital alignment.
Surjana & Pudjiarti (2025)	Digital leadership drives process innovation through technology adoption.	Business performance improves. Leadership culture synergy is critical.
Nasrun et al. (2025)	Digital leadership accelerates adoption of AI and blockchain.	Organizational performance and employee well-being improve. Sustainability integrated.
Jiang (2024a)	Leadership strategies guide adoption of AI, big data, and cloud systems.	Higher efficiency and competitiveness with strong policy and ecosystem support.
Jiang (2024b)	Leadership impact implicit in financial management innovation	Financial management efficiency and transparency improved
Shao et al. (2024)	Leadership influences transformation through infrastructure and learning capability.	Performance linked to competitive market pressure.
Cui et al. (2022)	Transformational and transactional leadership enhance learning and innovation.	Innovation performance improves through organizational learning.
Xu (2024)	Leadership shapes strategy and skills but faces funding and talent constraints.	High quality development linked to transformation success.
Zhao & Liu (2024)	Leadership impact moderated by government support and ICT investment.	Financial performance improves. Organizational inertia may hinder agility.

Kallmuenzer et al. (2024)	Leadership affects adoption indirectly through workforce skills and culture.	Performance depends on adoption success. Risk adverse culture limits progress.
Jia et al. (2024)	Entrepreneurial leadership and stakeholder collaboration drive adoption depth.	Transformation stages affect performance. Government cluster support matters.
Mansor & Leong (2024)	Leadership enhances employee digital capability and adaptability.	Performance linked to competitive climate. Adoption effects moderated by environment.
Cui (2025)	Leadership and management strategies guide integrated transformation.	Operational efficiency and customer satisfaction improve under resource constraints.
Cen & Lin (2025)	Leadership supports innovation through digital transformation and resource allocation.	Innovation performance measured by patents. Digital finance coverage moderates effects.
Sudarnice et al. (2024)	Technology adoption linked to innovation with limited leadership emphasis.	Mixed evidence on adoption innovative relationship.
Arifia (2024)	Organizational readiness embeds leadership influence using TOE framework.	Adoption positively affects digitalization outcomes. Market forces mediate effects.
Canh & Thành (2024)	Knowledge management capacity signals technology value and adoption.	Transformation intention increases. TAM and signaling theory integrated.
Zhang & Bu (2023)	IT background of top managers promotes transformation and investment.	Financing efficiency and transformation success improve.
Teng et al. (2022)	Leadership affects performance indirectly through digital skills.	Financial performance improves. Transformation mediates strategy performance link.
Barragan & Becker (2024)	Leadership vision shapes digital orientation and capability development.	Performance follows a U-shaped pattern with digital orientation.
Chen et al. (2024a)	Leadership less central. Policies and digital foundation drive adoption.	Business model innovation linked to transformation success.
Chen et al. (2024b)	Leadership indirectly affects transformation effectiveness.	Digital transformation effectiveness improved in SMEs.
Chen et al. (2024c)	Leadership impact via executive knowledge level	Digital transformation prediction improved by machine learning
Cui & Meng (2024)	CEO overconfidence influences transformation through entrepreneurial orientation.	Transformation success linked to executive psychological traits.
Zou & Ali (2024)	Leadership impact varies across regions with infrastructure differences.	Performance varies by regional digital development.
Marzuki et al. (2023)	Leadership role combined with digital technology adoption to increase worldwide.	Adoption linked to SME competitiveness. Research gaps and sample diversity

Zhang et al. (2023)	Leadership combined with culture and human capital drives adoption intention.	Institutional and market pressures reinforce adoption.
Xing & Yang (2023)	Leadership influences innovation through resource configuration.	Digital transformation enhances innovation performance.
Li (2025)	Leadership strategies manage transformation via skills and culture investment.	Sustainable competitive advantage achieved with external partnerships.
Cui (2024)	Transformational leadership strengthens agility and digital strategy.	Transformation outcomes improve through leadership strategy alignment.
Chen (2025)	Leadership affects platform capability and value co creation.	Transformation performance enhanced. Policy perception moderates effects.
Yang & Entebang (2024)	Entrepreneurial leadership boosts technology driven innovation.	Radical innovation improves. Cultural values moderate leadership effects.
Tuấn (2023)	Digital leadership capability drives adoption and strategy execution.	Business performance improves through digital capacity.
Luo & Zhang (2024)	Leadership and government collaboration address adoption barriers.	Transformation progresses slowly due to talent and capital gaps.
Zhu & Jin (2023)	Flexible leadership promotes transformation willingness.	Environmental dynamics strengthen leadership effects.
Prihandono et al. (2024)	Leadership shapes digital strategy and agility.	SME performance improves under competitive pressure.
Song et al. (2023)	Leadership implicit within organizational and environmental configurations.	Innovation performance improves through multi factor paths.
Wang & Zhang (2024)	Military executive leadership positively affects transformation	Transformation enhanced in specific industries and symbiosis orientation moderates leadership.
Khattak et al. (2024)	Managerial overconfidence and digital culture shape transformation.	Sustainable competitive performance improves.
Gun et al. (2024)	Transformational leadership enhances agility and employee self-efficacy.	Operational and financial performance improve under uncertainty.
Kong et al. (2023)	STEM CEO background enhances transformation.	Digital transformation performance improved and CEO background critical for strategy.
Toros (2024)	Leadership traits and trust are critical for digitalization.	Digitalization progress is linked to leadership traits.
Chang & Octoyuda (2024)	Transformational leadership mediates learning agility and adoption.	Adoption of digital leadership and innovations improved
Zulkipli et al. (2025)	Leadership influences adoption through organizational factors.	Operational cost reduction is a key benefit and comprehensive factor analysis for SMEs

Discussion

This systematic review, in line with the PRISMA methodology, provide a more comprehensive understanding on digital transformation and leadership in SMEs and helps to consolidate dispersed evidence in the literature using a systematic and replicable process. This finding supports the key position of leadership in the explanation of SME engagement, process and continuity of digital transformation. Leadership is a common trend across studies in that it conditions strategic intent, resource allocation, and organizational readiness and, by consequence, the outcomes of technology adoption and transformation (Cui et al., 2022; Yang & Entebang, 2024; Gun et al., 2024). This confirms the idea that the digitalization of SMEs is more related to an organizational and managerial change than to a technological one.

In terms of critical synthesis, several common thematic trends are identified and some of the weaknesses in the literature are noted. Transformational, entrepreneurial, and digital forms of leadership are the most prevalent in the studies and are often associated with innovation performance, efficiency and advantage. The problem is that most of the existing studies use cross-sectional survey data and subjective performance measures in their analyses, limiting the possibility for causal inference. Effects of leadership are usually tested in isolation and little room is given to interaction between leadership, organizational capabilities and environmental pressures. These gaps seem to indicate that the existing evidence might be overrating the direct effects of leadership, and at the same time, it could be de-emphasizing pathways of complex transformation (Kallmuenzer et al., 2024; Wu & Yang, 2024).

This review theoretically contributes for it helps clarify the place researchers can attribute to the concepts of leadership within mainstream paradigms of digital transformation. They tend to implicitly or explicitly build upon the dynamic capabilities, the resource-based view, and the technology organization environment perspectives. Thematically, leadership is often considered as a micro foundation that enables the activation of digital capabilities and that can drive the alignment of the use of technology with strategic objectives. Theoretical integration is still lacking as a small number of studies specifically relate leadership behaviours to explanatory mechanisms of multifaceted change at multiple levels across time. Using PRISMA as a synthesis guide, it becomes clear that there is a need for further research that incorporates stronger theoretical frameworks linking leadership to process oriented, longitudinal models of SME digital transformation (Barragan & Becker, 2024; Cui, 2024).

The practical implications for SME owners, managers, and policymakers are also clear from these findings. Competent leaders bridge the visioning of technology with the operations of integrating technology capabilities. Leaders should think about bringing along their employees in terms of digital capabilities and should be creating a favourable digital culture that will support them to implement technology in such a way as to serve their business needs. This has implications for those putting policies in place or support structures, as it means that leadership development programs and digital skills education should be connected to some extent, and not seen as separate programs. This review also points to the fact that general digital technology penetration policies may not work if the readiness of leadership in SMEs is not considered concurrently (Sharma et al., 2025; Xu, 2024).

Methodologically, the present study contributes by capturing the value of a strict application of PRISMA 2020 criteria in management and entrepreneurship research. The clear identification of identification, screening, eligibility, and inclusion decisions responds to some of the shortcomings in previous reviews. At the same time, it reveals several methodological deficiencies in the current literature, such as lack of clarification on the recruitment method, lack of explanation for exclusion choices, and the fact several studies do not include a full PRISMA flow diagram. These limitations affect the possibilities for research comparability and cumulativeness of knowledge. To address this, the current study provides a clear review protocol, which can be employed or modified at future researchers' discretion.

Problems concerning variations across sectors and contexts also did emerge as relevant issues within the literature as well. A large majority focus on SMEs in the manufacturing, services, or technology sectors within an emerging or Asian context and very few include micro-enterprises, traditional sectors or rural areas (Agrahari, 2025; Zhang, 2024; Das et al., 2019). Whether leadership matters for digital transformation are contingent on institutional context, regulatory environment, and the state of the market, but these aspects are often taken as a given rather than being treated as central concepts in the analysis. Applying the guidelines of the PRISMA synthesis also highlights the call for more qualitative, comparative, contextual, cross-sectoral studies looking at the digitalization of SMEs and leadership within firms that can be filtered through contextual and industry lenses (Yu-ping, 2024; Luo & Zhang, 2024).

In general, this synthesis advances social science research by positioning leadership as a micro foundation that connects digital capabilities, organizational change, and performance in SMEs. This discussion recognizes both the substantive and the methodological contributions of the present PRISMA guide. From a substantive standpoint, it provides further support regarding the SME digital transformation as a leadership driven process. It also brings an important contribution from a methodological perspective, as it aims to increase transparency, consistency and theoretical progress in a rapidly growing field of studies such as the one on refugees by applying PRISMA strictly.

Limitations

This PRISMA guide systematic review has some limitations that need to be taken into consideration. The first is that the review is based on peer reviewed journal publications that are in major academic databases. This helps to reach a minimum level of quality for the studies, but it also may cause missing relevant research from conference proceedings, policy reports or practitioner-oriented publications. Therefore, some novel research insights on SMEs' digital transformation and leadership may emerge that is not entirely accounted in this study (Barragan & Becker, 2024).

Second, the studies reviewed are mostly based on cross sectional research designs and self-reported measures of leadership, technology adoption, and performance. This lack of strong causality and common method bias concerns runs the risk of over inflating reported relationships. But this can to some extent be considered a limitation which is due to the status of the research rather than a limitation of the review process, as this restricts the ability to synthesize the evidence (Kallmuenzer et al., 2024).

Thirdly, acknowledging that PRISMA 2020 guidelines have been strictly followed, this means that the review is tied to the quality and transparency of the identified works. Poor and unclear descriptions of methods, lacking explicit theoretical framing, and indeterminate description of sampling procedures in primary studies all pose problems for comparative analysis. Lastly, the literature review specifically presents literature only published within dates and primarily in the English language, possibly resulting in a bias towards more recent work and research published in other languages, especially work conducted in non-Western contexts (Yu-ping, 2024).

Future Research Directions

This PRISMA is intended to be expanded on in multiple useful directions. First, a stronger methodological diversity of primary studies should be introduced, such as the use of longitudinal and mixed method and process study designs. This type of modality can also help absorbing the dynamic and iterative process of the digital transformation in SMEs and provide insights on the role of leadership in shaping the process and outcomes over time (Wu & Yang, 2024; Sharma et al., 2025).

Secondly, it is recommended that future systematic reviews adhere to the PRISMA 2020 requirements and provide complete details of all stages of the review processes with detailed reasons for exclusion and full flow diagrams. A PRISMA-based comparative review of SME digital transformation and leadership studies in various regions and/or at sector levels might also enhance scholar's knowledge of contextual variations in this research (Cui, 2024).

Third, a higher level of theoretical integration is required. Future research should overcome the use of a single theory and develop multi-level theories that combine leadership behaviours, capabilities of the organization, and environment. Future research can merge theories such as dynamic capabilities, institutional theory and digital entrepreneurship to contribute to the advancement of theory in this area (Barragan & Becker, 2024).

Lastly, future research should extend the empirical base to underrepresented contexts such as micro enterprises, rural SMEs, and traditional industries. Comparative research at cross countries levels can give insights on how institutional contexts affect leadership in the digital transformation. Responding to these trends will help take SME digital transformation research to a more solid foundation both in its subject matter and methodology.

Conclusion

The present research refines and implements a PRISMA compliant systematic review method to analyze digital transformation and leadership in the context of small and medium enterprises. The application of strict adherence to PRISMA 2020 ensures that reviewers are following these ongoing concerns of transparency, rigidity, and replicability in management and entrepreneurship reviews. The structured reporting of identification, screening, eligibility, and inclusion processes provide clear reports of what should be considered in the conduct and appraisal of SME digital transformation research and has been shown to enhance the credibility of the synthesis of evidence in the field (Arifia, 2024; Barragan & Becker, 2024).

On the substantive side, this study confirms the role of leadership as key to foster digital transformation among SMEs. In all context's leadership impacts orientation to the

market, technologies that are adopted, organizational capability and subsequently performance. Transformational, entrepreneurial and digital leadership styles appear as the most prominent explanatory constructs, which further contributes to reinforcing the perspective that digital transformation is inherently a leadership driven organizational change process rather than a purely technical endeavour (Cui et al., 2022; Yang & Entebang, 2024; Gun et al., 2024).

Finally, this study offers a research protocol applicable to future studies that address SME digital transformation and leadership by providing a unified and replicable PRISMA review guide. Several issues typical of previous reviews, such as noncomprehensive reporting and lack of uniform use of review criteria, are overcome through a detailed accounting of search strategies, criteria used in screening, and how findings were thematically synthesized. It contributes to improve systematic reviews and is a hands-on resource for researchers aiming at publishing in high impact journals (Cui, 2024; Kallmuenzer et al., 2024).

In general, this study contributes original value by offering a replicable PRISMA review protocol and a leadership centred synthesis tailored to SME digital transformation research. Moreover, it contributes to the cumulative growth of knowledge by gathering disaggregated evidence as well as by the important substantive insights and methodological gaps. It calls for future studies to apply more solid review methodologies and different empirical designs. This research will also help to further the research on digital transformation and SME leadership, seeking to continue to improve methodological and substantive contributions in these fields.

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