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From Digital Resources to Transformation Adoption: The Mediating Role of Digital Capabilities in Saudi SMEs

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Abstract

Purpose: This conceptual paper explains how digital technology and digital strategy influence digital transformation adoption among small and medium-sized enterprises (SMEs) in Saudi Arabia, with digital capabilities as a mediator. **Design/methodology/approach:** The paper adopts a conceptual design based on integrative literature synthesis. The resource-based view conceptualises digital technology and digital strategy as organisational resources, while dynamic capabilities theory conceptualises digital capabilities as the conversion mechanism linking resources to the adoption of transformation. **Findings:** The paper argues that technology creates technical possibilities and strategy provides direction, but neither automatically produces organisation-wide transformation. The paper proposes digital capabilities as the mechanism through which SMEs integrate, deploy, and reconfigure digital resources for sustained adoption. **Research limitations/implications:** The paper is conceptual and does not claim empirical findings. It offers propositions for future organisation-level testing among SME owners and senior managers. **Practical implications:** SME managers and policy institutions should complement technology investment and strategy formulation with capability-building support, including integration, learning, governance, and cross-functional implementation routines. **Originality/value:** The paper offers a parsimonious resource-capability-adoption model tailored to Saudi SMEs and clarifies the difference between technology possession and digital transformation adoption.

Keywords: Digital Transformation Adoption, Digital Technology, Digital Strategy, Digital Capabilities, Saudi SMEs, Dynamic Capabilities

Introduction

Digital transformation adoption has become a pressing strategic issue for SMEs. SMEs are expected to operate in markets shaped by data, platform-based interactions, digital customer interfaces, automated processes, and rapid cycles of innovation (Kallmuenzer et al., 2025;

Sagala & Őri, 2024). Yet adoption remains uneven. Many SMEs acquire digital tools, subscribe to cloud services, open online channels or use digital platforms without achieving deeper changes in routines, decision-making, coordination or value creation (Kahveci, 2025). This distinction matters because digital transformation is not equivalent to the purchase of a technology. (Vial, 2019) conceptualises digital transformation as a process in which digital technologies trigger strategic responses and organisational changes that alter value creation. Therefore, the central issue is not simply whether an SME has access to technology, but whether the firm can convert technology and strategy into meaningful organisational adoption.

The Saudi context makes this issue particularly important. Saudi Arabia has invested heavily in digital government, infrastructure and national transformation programmes, creating an environment in which digital services and technological opportunities are increasingly visible (Aldahash, 2025). Public initiatives have also created opportunities for SMEs in cloud services, emerging technologies, digital products, and government digital demand. (Monsha'at, 2024) reported that government digital demand in 2023 was estimated at 32 billion Saudi riyals, with SMEs connected to opportunities in emerging technologies and cloud-based platforms. However, wider national digital readiness does not guarantee that every SME can translate digital resources into firm-level transformation. SMEs differ in managerial capacity, technological integration, financial flexibility, organisational learning and strategic clarity.

The problem addressed in this paper is both conceptual and practical. Conceptually, prior digital transformation research often emphasises technologies, leadership, readiness, culture, strategy or performance as separate factors. This literature has generated useful knowledge, but it can leave the transformation mechanism underdeveloped. If technology is treated as an input and adoption as an output, the process through which technology becomes coordinated organisational action may remain unclear. Likewise, if digital strategy is considered sufficient by itself, researchers risk overlooking the routines and capabilities required to operationalise that strategy. Practically, this issue is consequential for SMEs because limited resources make poorly integrated digital investments costly.

This paper responds by developing a parsimonious conceptual framework linking digital technology and digital strategy to digital transformation adoption through digital capabilities. The framework is intentionally focused and does not reproduce a broader research proposal with many antecedents and mediators. Instead, it concentrates on two organisational digital resources and one mediating mechanism. Digital technology represents the systems, platforms, infrastructure and digital tools available to the SME. Digital strategy represents the strategic direction, priorities and governance arrangements that guide digital initiatives. Digital capabilities represent the firm's ability to integrate, deploy, coordinate and reconfigure digital resources across organisational activities.

The purpose of the paper is to explain how digital technology and digital strategy become actionable through digital capabilities in Saudi SMEs. The guiding question is: how do digital technology and digital strategy contribute to digital transformation adoption through the mediating role of digital capabilities? Addressing this question is useful because SMEs may operate in the same national digitalisation environment while still achieving different levels of transformation adoption. The proposed framework explains this variation by arguing that

the resources a firm possesses are important, but the capabilities through which those resources are coordinated are decisive.

The paper makes three contributions. First, it contributes theoretically by integrating the resource-based view (RBV) and dynamic capabilities theory (DCT) in a clear resource-capability-adoption sequence. RBV explains why digital technology and digital strategy may create firm-level differences, while DCT explains why digital capabilities are necessary to reconfigure these resources in dynamic environments. Second, it contributes conceptually by clarifying the distinction between digital technology adoption and digital transformation adoption. Third, it contributes contextually by applying the model to Saudi SMEs, where strong national digitalisation initiatives coexist with firm-level differences in readiness, implementation, and capability development.

Literature Review

To lead the reader to this point, it is necessary to review the relevant literature briefly.

Digital Transformation Adoption in SMEs

Digital transformation adoption in SMEs should be understood as an organisation-level pattern of change rather than a narrow technology decision. Digitalisation may begin with basic systems, e-commerce channels, digital payment solutions, accounting software, customer relationship management tools or data platforms. However, digital transformation adoption occurs when these technologies become embedded in business processes, managerial routines, customer interaction, resource allocation and value creation. This distinction is essential in SME research because smaller firms often adopt technologies incrementally. Their transformation may be gradual, informal, and resource constrained, but it still requires alignment between digital tools and organisational practice (Escoz Barragan & Becker, 2025; Kallmuenzer et al., 2025; Sagala & Őri, 2024).

Recent SME literature supports a more holistic view of transformation. (Clemente-Almendros et al., 2024) show that digital transformation among SMEs is shaped by determinants that vary with size heterogeneity, suggesting that SMEs cannot be treated as a uniform group. (Sagala & Őri, 2024), through a systematic review, argue that SME digital transformation involves multiple business aspects, including organisational learning, IT alignment, leadership, collaboration, and digitalisation processes. (Kahveci, 2025) Further argues that successful SME transformation requires interlinked elements such as digital awareness, strategy and roadmap, adoption and implementation, and continuous improvement.

The literature also reveals a recurring problem: many models still emphasise direct relationships between digital inputs and business outcomes. These relationships are important, but they do not fully explain how transformation unfolds inside SMEs. A firm may own digital systems but lack the routines to integrate data across departments. It may have an online sales channel but fail to connect it with inventory management, customer service, or strategic decisions. It may possess digital tools but lack the managerial discipline to redesign workflows. These situations show that technology adoption and transformation adoption differ. The first concerns possession or use; the second concerns organisational embedding (Jordan-de-Urries et al., 2026).

For Saudi SMEs, this distinction is especially relevant because the national environment increasingly encourages digitalisation. (Asiri et al., 2024) found that sustainable technology and big data analytics are relevant to improving performance in Saudi SMEs, but such benefits depend on the way technology and data are organised and used. (Tripathi & Singh, 2024) similarly examine awareness and preparation for digital transformation among SMEs in Saudi Arabia, showing that preparation matters alongside awareness. These studies reinforce the idea that digital transformation adoption is shaped by organisational readiness and capability, not by technology exposure alone.

Digital Technology as an Organisational Digital Resource

Digital technology is the first resource in the proposed model. It refers to the digital systems, platforms, infrastructure, applications, data tools and connectivity that allow firms to automate activities, exchange information, analyse data, reach customers and coordinate operations. In SME contexts, digital technology may include cloud computing, e-commerce platforms, accounting and enterprise systems, mobile applications, digital payment solutions, analytics tools and communication platforms. These technologies provide the technical foundation for digital transformation, but they do not possess value independently of organisational use (Escoz Barragan & Becker, 2025; Yuwono et al., 2024).

From an RBV perspective, digital technology can be treated as a resource because it is part of the asset base that firms deploy to compete and operate. However, not every technology resource is valuable, rare or difficult to imitate in the same way. Many digital tools are widely available, relatively affordable and accessible to several competitors. The strategic value of technology therefore depends less on ownership and more on how it is configured, integrated and used (Melville et al., 2004). (Barney, 1991) emphasises that resources contribute to sustained advantage when they are valuable, rare, imperfectly imitable and supported by organisational arrangements. In the digital context, this means that the same technology may produce different outcomes depending on the firm's capabilities.

SME research consistently warns against treating technology as a simple solution. Digital tools can support efficiency, data visibility and market reach, but they can also create fragmented systems if introduced without process redesign. Cloud-based platforms may improve flexibility, but only when data are shared, responsibilities are clear, and users understand how the platform supports business decisions (Saeedikiya et al., 2024). Analytics tools may generate insights, but only when managers can interpret and act on them. E-commerce platforms may open new markets, but only when logistics, customer service, payment systems and marketing processes are coordinated.

This argument is consistent with recent literature on SMEs. (Forum, 2024) highlights that SME digital transformation requires not only the adoption of technologies but also strategic, organisational and policy support. (Clemente-Almendros et al., 2024) show that determinants of SME transformation differ across firm sizes, implying that technology effects are conditioned by organisational characteristics. In Saudi Arabia, (Asiri et al., 2024) suggest that advanced technologies and big data analytics can improve performance when embedded in organisational arrangements. Therefore, digital technology is proposed as an antecedent of digital capabilities, because capabilities are needed to integrate tools into routines and use them across business functions.

Digital Strategy as a Strategic Digital Resource

Digital strategy is the second resource in the framework. It refers to the direction, priorities, governance mechanisms and investment logic that guide digital initiatives in the firm. A digital strategy clarifies why the firm is investing in digital tools, which business processes should be prioritised, who is responsible for implementation, how digital initiatives align with business goals and how the organisation should evaluate digital progress. Without such direction, digital adoption can become reactive, fragmented or technology-driven rather than business-driven (Canhoto et al., 2021; Kohtamäki et al., 2025).

Digital strategy has received increasing attention because transformation requires coordination across technological, organisational and market dimensions. (Wurm et al., 2025) described digital transformation strategy as a framework that coordinates technologies, structures, value creation and implementation pathways. This view is important for SMEs because their digital decisions are often shaped by limited budgets, managerial attention and operational urgency. A clear strategy helps SMEs avoid scattered investments and instead connect digital initiatives to performance, customer engagement, innovation and sustainability goals.

Nevertheless, strategy alone is insufficient. A strategy may be formally written but weakly implemented. It may identify digital priorities but fail to change routines. It may announce transformation goals but leave departments working with disconnected systems. This is a common weakness in both practice and research: strategy is sometimes treated as if articulation equals execution. In reality, the organisational value of digital strategy depends on the firm's ability to translate priorities into capabilities, routines and coordinated action. This is especially true for SMEs, where strategy may be informal and heavily shaped by owner-manager decisions (Kahveci, 2025; Ocloo et al., 2024; Saeedikiya et al., 2024).

Recent empirical work supports this interpretation. (Gyamerah et al., 2025) examine digital transformation in SMEs and show that leadership, digital capabilities and digital strategy interact in shaping transformation outcomes. Their findings suggest that digital strategy is relevant, but it operates alongside capability development rather than replacing it. Also positions digital strategy and roadmap as part of a broader SME transformation process, linked with adoption, implementation and continuous improvement (Kahveci, 2025). These studies suggest that digital strategy should be conceptualised as a strategic resource that requires capability-based execution.

Digital Capabilities as the Conversion Mechanism

Digital capabilities are the central construct in this paper. They are defined as the organization’s ability to acquire, combine, integrate, deploy and reconfigure digital resources across business functions. This definition distinguishes digital capabilities from digital technology. Technology concerns tools and infrastructure; capabilities concern what the firm can do with those tools. Digital capabilities include the ability to integrate systems, use data in decision-making, coordinate digital projects, redesign processes, learn from digital experimentation and adapt resources as market or operational requirements change (Fang et al., 2024; Zheng et al., 2026).

DCT provides a strong foundation for this construct. (Teece et al., 1997) argue that dynamic capabilities concern the firm's ability to integrate, build and reconfigure internal and external competences in changing environments. Digital transformation is precisely such an environment because technologies, customer expectations, competitive pressures and regulatory demands change continuously. Digital capabilities therefore operate as transformation routines. They help SMEs sense opportunities, seize digital options and transform operations. (Teece, 2007) Later clarifies that dynamic capabilities involve sensing, seizing and reconfiguring, which map well onto digital transformation activities.

Recent SME studies increasingly support this capability-based explanation. (Rahman et al., 2025) show that dynamic capabilities are relevant for digital transformation and environmental performance in SMEs, highlighting the role of sensing, seizing and transforming capacities. (Held et al., 2026) Position dynamic capabilities as foundational for digital leadership and digital culture in SME transformation. (Sagala & Őri, 2024) identify organisational learning and IT alignment as core success factors in SME digital transformation. These findings converge around one message: transformation requires the ability to organize resources, not merely possess them.

Digital capabilities are particularly important for SMEs because smaller firms may have fewer formal structures and fewer specialized roles than large firms. This can create constraints, but it can also allow flexibility. SMEs may respond quickly when their managers understand digital opportunities and when employees can combine technical and business knowledge. However, without capabilities, SMEs may remain dependent on external vendors, isolated software tools or short-term digital fixes. Capability development therefore provides the bridge between technology availability, strategic intention and transformation adoption.

Digital Capabilities and Digital Transformation Adoption

Digital capabilities are expected to influence digital transformation adoption because they enable the firm to embed digital resources into organisational routines. A capable SME can connect technologies with business processes, interpret digital information, adjust workflows, allocate responsibilities and evaluate implementation. These activities move the firm from partial digitalisation toward transformation adoption. Without digital capabilities, technology may remain underused and strategy may remain aspirational.

Digital transformation adoption also requires repeated adaptation. Digital tools evolve, customer channels change, cybersecurity risks increase and data requirements become more complex. The firm must therefore adapt rather than simply implement once. This explains why DCT is useful for this paper. Transformation adoption is not a single event; it is a continuing organisational process. SMEs with stronger digital capabilities are better positioned to sustain transformation because they can reconfigure digital resources as needs change.

The literature increasingly recognizes this conversion logic. (Gyamerah et al., 2025) demonstrate the relevance of digital capabilities in linking leadership, strategy and transformation in SMEs. (Held et al., 2026) show that dynamic capabilities enable transformation-related organisational conditions. (Hafeez et al., 2025) also emphasise knowledge management and capability development in SME digital transformation. These

studies suggest that capabilities do not merely support digital transformation; they explain how resources become transformation. For this reason, the present paper positions digital capabilities as the mediating mechanism between digital technology, digital strategy and digital transformation adoption.

Theoretical Foundation

The conceptual framework is grounded in RBV and DCT. RBV explains the resource side of the model. It assumes that firms differ because they possess and organise different resources and that these differences may influence outcomes (Barney, 1991). In this paper, digital technology and digital strategy are conceptualised as organisational digital resources. Digital technology provides technical infrastructure and tools, while digital strategy provides direction and governance. These resources may support transformation adoption, but RBV alone is not sufficient because it does not fully explain the process through which resources are renewed and reconfigured in changing environments.

DCT complements RBV by explaining how resources are mobilised, integrated and transformed. (Teece et al., 1997) argue that firms require dynamic capabilities to adapt to changing environments. This logic is suitable for digital transformation because digital technologies continuously alter processes, markets and value creation. DCT explains why some SMEs can convert similar resources into stronger adoption outcomes while others cannot. The difference lies in the capability to sense opportunities, seize them and reconfigure organisational arrangements. Therefore, digital capabilities are not treated as another ordinary variable; they are the mechanism that activates technology and strategy.

Combining RBV and DCT provides a coherent theoretical sequence. RBV identifies what the SME possesses: digital technology and digital strategy. DCT explains what the SME can do with those resources: integrate, deploy, learn and reconfigure. The outcome is digital transformation adoption. This combined logic prevents the model from becoming a simple input-output framework and gives the mediation argument theoretical depth. It also fits the Saudi SME context because firms may share access to national digital infrastructure yet differ in how they organize and apply digital resources.

Conceptual Framework and Propositions

The proposed framework links digital technology and digital strategy to digital capabilities, and digital capabilities to digital transformation adoption. The framework also proposes that digital capabilities mediate the relationships between both resources and adoption. Figure 1 presents the conceptual framework. The model is deliberately parsimonious because the paper aims to explain one central mechanism: how technological and strategic resources are converted into organisational transformation adoption.

Digital technology is expected to support digital capabilities because technological resources provide the tools, platforms and data infrastructure that make digital integration possible. However, the relationship is not treated as automatic. Digital tools become capabilities when the SME develops routines for using systems across functions, coordinating information, redesigning processes and learning from digital use. Therefore, technology is conceptualised as an enabling resource that strengthens digital capabilities when organized effectively (Arroyabe et al., 2024; Zhang et al., 2024).

Digital strategy is also expected to support digital capabilities because strategy guides priorities, investment and governance. A coherent digital strategy helps SMEs decide where to focus scarce resources, how to sequence digital initiatives and how to align digital projects with business objectives. When strategy is translated into routines, responsibilities and learning processes, it becomes a source of capability development. Without such translation, strategy remains symbolic.

Digital capabilities are expected to support digital transformation adoption because they allow the SME to integrate and reconfigure resources into sustained organisational practice. Capabilities help the firm move from isolated digital initiatives to coordinated transformation. They also explain mediation. Digital technology creates technical options, and digital strategy creates strategic direction, but digital capabilities convert both into adoption (Arroyabe et al., 2024; Gyamerah et al., 2025; Zhang et al., 2024).

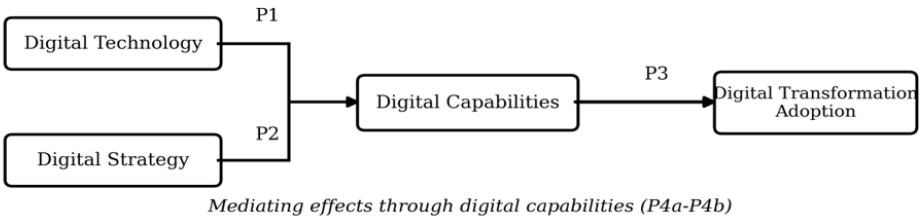

Figure 1. Conceptual framework.

Propositions

P1: Digital technology is positively associated with digital capabilities in SMEs.
P2: Digital strategy is positively associated with digital capabilities in SMEs.
P3: Digital capabilities are positively associated with digital transformation adoption in SMEs.
P4a: Digital capabilities mediate the relationship between digital technology and digital transformation adoption in SMEs.
P4b: Digital capabilities mediate the relationship between digital strategy and digital transformation adoption in SMEs.

Table 1
Summary of proposed relationships

Proposition	Relationship	Interpretation
P1	Digital Technology to Digital Capabilities	Digital tools and infrastructure strengthen the firm ability to integrate and use digital resources.
P2	Digital Strategy to Digital Capabilities	Strategic direction guides investment, governance and coordination needed for capability development.
P3	Digital Capabilities to Digital Transformation Adoption	Capabilities enable SMEs to embed digital resources in routines, processes and value creation.
P4a	Digital Technology to Digital Capabilities to Adoption	Digital capabilities mediate the technology-adoption relationship.
P4b	Digital Strategy to Digital Capabilities to Adoption	Digital capabilities mediate the strategy-adoption relationship.

Critical Synthesis of Previous Studies

A critical reading of previous studies shows that the digital transformation literature has moved beyond the narrow question of whether SMEs use technology. The more important question is how digital resources are organised inside firms. Some studies focus on the availability of technology, others on leadership, and others on strategy or culture. These streams are useful, yet they often remain parallel. The result is a fragmented explanation in which many factors are listed, but the mechanism connecting them is not always clear. This paper responds to that problem by treating digital capabilities as the integrative mechanism that connects technology and strategy with transformation adoption.

The technology stream explains what firms can potentially use, but it does not fully explain what firms can accomplish. A technology-based explanation may assume that digital tools create efficiency, new customer channels or data-driven decisions. In practice, these benefits depend on integration, employee routines, managerial interpretation and process redesign. This is why the proposed model does not move directly from digital technology to adoption. It first asks whether the technology strengthens digital capabilities. This is a more cautious and academically defensible argument because it recognises that technology can remain isolated when capabilities are weak.

The strategy stream adds another important insight by showing that transformation needs direction. However, previous strategy discussions sometimes understate the implementation gap. A digital strategy may define priorities, but it does not guarantee that the SME has the capacity to integrate systems, coordinate people or adjust routines. For this reason, the present paper positions digital strategy as a resource that contributes to capabilities rather than as a direct substitute for capabilities. This distinction is important for SMEs, where strategy may be informal, owner-driven and constrained by limited managerial time.

The capabilities stream offers the strongest explanation for variation among SMEs. If two firms possess similar technologies and both claim to have digital strategies, their adoption outcomes may still differ because their capabilities differ. One firm may have routines for learning, experimentation, integration and cross-functional coordination, while the other may depend on ad hoc use of tools. This is the theoretical value of the mediator. Digital capabilities explain why similar resource conditions do not always produce similar adoption outcomes.

The Saudi SME context strengthens the need for this critical synthesis. National digitalisation may increase access to platforms, infrastructure and support programmes, but firm-level adoption still depends on how SMEs internalise and apply digital resources. Therefore, the paper does not treat Saudi digitalisation as a background slogan. It treats the Saudi context as a setting in which national digital opportunities and firm-level capability differences meet. The proposed framework is valuable because it links these two levels without claiming unsupported empirical results.

Method

This paper follows a conceptual research design. Conceptual papers do not test data in the same way as empirical articles; instead, they develop theoretical arguments, clarify constructs, synthesize prior studies and propose relationships for future testing. This approach is appropriate because the purpose of the paper is to explain the mechanism

through which digital technology and digital strategy become digital transformation adoption via digital capabilities. The paper therefore offers theoretically grounded propositions rather than empirical results.

The literature used in this paper was selected through an integrative synthesis of recent digital transformation, SME digitalisation, digital strategy, digital capabilities and dynamic capabilities research. Priority was given to peer-reviewed journal articles published in reputable outlets, especially studies from 2024 and 2025, while retaining foundational theoretical works that remain necessary for conceptual grounding. (Barney, 1991) and (Teece et al., 1997) are retained because they provide the theoretical basis for RBV and DCT. (Vial, 2019) is retained because it offers a widely cited conceptualisation of digital transformation. Recent SME-focused studies are then used to connect these theories to current digital transformation debates.

The synthesis followed three steps. First, the paper identified the main constructs required by the accepted framework: digital technology, digital strategy, digital capabilities and digital transformation adoption. Second, the paper examined how recent literature explains relationships among resources, capabilities and adoption in SMEs. Third, the paper developed propositions by linking the literature to RBV and DCT. This process was not intended to produce a systematic review with database counts or PRISMA screening. Instead, it was designed to build a focused conceptual explanation. This is acceptable for a conceptual paper because the contribution lies in theoretical integration and model development.

The unit of analysis implied by the framework is the organisation, specifically the SME. This is important because the constructs are not individual-level perceptions alone. Digital technology, digital strategy, digital capabilities and digital transformation adoption refer to firm-level resources, routines and outcomes. Future empirical testing should therefore collect responses from SME owners, senior managers, digital transformation managers, IT managers or other decision-makers who understand organisational digital practices. The proposed model could be tested using structural equation modelling because it includes direct and indirect relationships. Firm size, firm age and sector may be used as control variables because SME heterogeneity can influence transformation adoption.

Findings

As a conceptual paper, the findings are theoretical findings derived from literature synthesis rather than statistical results. Three conceptual findings emerge from the analysis. First, digital transformation adoption should be treated as an organisational outcome that differs from the adoption of individual technologies. This distinction is essential because SMEs may use several digital tools without transforming processes, coordination or value creation. The framework therefore avoids equating technology possession with transformation adoption.

Second, digital technology and digital strategy are necessary but insufficient resources. Digital technology provides tools, platforms and data possibilities, while digital strategy provides direction and prioritisation. Yet both resources can remain weakly connected to organisational practice. Technology can be fragmented, and strategy can remain aspirational. These findings challenge simple models that assume a direct movement from resources to

adoption. It suggests that researchers and managers should examine the organisational mechanism that converts resources into adoption.

Third, digital capabilities provide that conversion mechanism. Digital capabilities allow SMEs to integrate systems, coordinate knowledge, redesign processes, learn from digital implementation and adapt digital resources over time. This explains why SMEs with similar access to technology or similar strategic intentions may achieve different levels of digital transformation adoption. The proposed mediation logic is therefore central to the paper: resources influence adoption through capabilities. This finding is consistent with DCT and with recent SME research that emphasises dynamic capabilities, IT alignment, organisational learning and implementation routines as transformation enablers.

These conceptual findings have a practical reading. If an SME invests in digital technology but lacks integration routines, it may experience digital complexity rather than transformation. If an SME writes a digital strategy but lacks implementation capabilities, the strategy may become a symbolic plan rather than an operational guide. If an SME develops digital capabilities, however, it can connect tools, priorities, people and processes in a way that supports transformation adoption. The value of the framework is that it identifies this conversion process explicitly.

Discussion

The proposed framework advances the digital transformation literature by shifting attention from resource possession to resource conversion. This is important because much of the managerial discussion around digital transformation still begins with technology acquisition. SMEs are often encouraged to adopt platforms, automate processes, use analytics or join digital marketplaces. These recommendations are useful, but they can be incomplete. Technology acquisition may improve visibility or efficiency in limited areas, yet transformation adoption requires deeper integration. By placing digital capabilities at the center of the framework, the paper argues that capability development is the missing mechanism between digital resources and adoption.

The framework also refines the role of digital strategy. Strategy is frequently presented as a solution to fragmented digitalization, and rightly so, because SMEs need direction. However, strategy is not self-executing. A digital roadmap does not redesign work by itself. A strategic document does not integrate systems, train employees or reconfigure customer interaction. The paper therefore conceptualizes strategy as a resource that contributes to capability development. This is a more realistic interpretation for SMEs, where strategic intent must be translated into routines despite limited resources.

The mediation logic has implications for research. It suggests that direct-effect models may overstate or understate the role of digital technology and digital strategy if capabilities are omitted. If technology is directly linked to adoption, researchers may conclude that technology has weak effects when the real issue is capability absence. Conversely, if strategy is directly linked to adoption, researchers may miss the routines that explain why some strategies are implemented and others are not. Testing digital capabilities as a mediator would provide a more precise explanation of transformation differences among SMEs.

The model also fits the Saudi context. Saudi Arabia's digital environment has created broad opportunities for businesses, and SMEs are increasingly exposed to digital platforms, digital government services and technology-based support. Yet national infrastructure does not erase firm-level differences. Some SMEs may use the environment to upgrade systems, improve customer channels and redesign processes. Others may adopt tools without integration. The proposed framework explains this variation by focusing on digital capabilities. Capability development becomes the bridge between the national digitalization environment and firm-level transformation adoption.

For managers, the framework implies that technology investment should be accompanied by capability-building practices. These include cross-functional implementation teams, data governance, employee learning, process redesign, integration between systems, vendor management, digital performance indicators and iterative improvement routines. For policymakers and support institutions, the implication is similar. SME support should not only subsidise technology acquisition or provide awareness programs. It should also help firms develop practical digital capabilities, such as implementation guidance, digital maturity assessment, managerial training and integration support.

The framework also connects with business sustainability and innovation. Digital capabilities may help SMEs use resources more efficiently, respond to market changes, reduce operational waste, improve customer engagement and support continuous innovation. However, these outcomes should not be assumed automatically. They depend on the ability to embed digital resources in business practice. By clarifying the conversion mechanism, the paper offers a more careful and academically defensible explanation of how digital resources may support sustainable and innovative business transformation.

Implications for Future Empirical Testing

Future empirical research should translate the conceptual framework into a measurement model that distinguishes clearly between resources, capabilities and adoption. Digital technology should be measured as the extent and integration of digital systems, not as a simple yes-or-no ownership variable. Digital strategy should capture alignment, prioritization, governance and resource allocation. Digital capabilities should measure integration, deployment, learning and reconfiguration routines. Digital transformation adoption should capture organisational embedding in processes, coordination, customer engagement and value creation. If these constructs are not separated carefully, future studies may reproduce the same conceptual confusion that this paper tries to reduce.

The proposed propositions are suitable for testing through a quantitative survey at the organisational level. Respondents should be individuals who understand firm-level digital decisions, such as owners, general managers, IT managers, digital transformation managers or senior staff involved in digital projects. Structural equation modelling would allow researchers to examine the direct paths from digital technology and digital strategy to digital capabilities, the direct path from digital capabilities to adoption, and the indirect effects represented by P4a and P4b. Sector, firm size and firm age can be added as controls because SMEs differ substantially in structure, resources and digital maturity.

Qualitative work could also extend the model. Case studies may show how SMEs actually build digital capabilities over time, how owners interpret digital strategy, and why some technologies remain isolated. Interviews could reveal whether capability development occurs through internal learning, external consultants, vendor relationships, government programs or customer pressure. Such studies would enrich the model by explaining the micro-processes behind the proposed relationships.

A mixed-method design would be particularly useful after initial quantitative testing. Survey results could identify whether the mediation effect exists, while interviews could explain how digital capabilities are built in daily practice. This would help future researchers avoid treating capabilities as abstract labels and instead examine the organisational routines that make digital transformation adoption possible. Such evidence would strengthen the practical relevance of the framework for Saudi SMEs and policy support institutions.

Conclusion

This conceptual paper developed a focused framework explaining digital transformation adoption among Saudi SMEs through the mediating role of digital capabilities. The framework proposes that digital technology and digital strategy influence digital capabilities, and that digital capabilities influence digital transformation adoption. It also proposes that digital capabilities mediate the relationships between digital resources and adoption. The central argument is straightforward but important: technology and strategy matter, but they do not automatically produce transformation. SMEs require capabilities that integrate, deploy and reconfigure digital resources into sustained organisational practice.

The paper contributes by combining RBV and DCT in a parsimonious model. RBV explains digital technology and digital strategy as organisational resources, while DCT explains digital capabilities as the mechanism that activates those resources in changing environments. The model also clarifies the difference between digital technology adoption and digital transformation adoption. This distinction protects the paper from a common conceptual weakness in digital transformation research, where the use of digital tools is treated as equivalent to transformation.

Future empirical research should test the proposed propositions using organisation-level data from Saudi SMEs. A survey of owners, senior managers, IT managers or digital decision-makers could measure digital technology use, digital strategy, digital capabilities and digital transformation adoption. Structural equation modelling would be suitable for testing both direct and mediation effects. Future studies may also compare sectors, firm sizes and stages of digital maturity. The paper concludes that digital capabilities are the bridge through which digital technology and digital strategy become real digital transformation adoption in SMEs.

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References

Aldahash, S. (2025). Implementation of additive manufacturing technologies for the growth and sustainability of manufacturing SMEs in Saudi Arabia: an exploratory study. *Sustainability, 17*(3), 1249. https://doi.org/https://doi.org/10.3390/su17031249

Arroyabe, M. F., Arranz, C. F., De Arroyabe, I. F., & de Arroyabe, J. C. F. (2024). Analyzing AI adoption in European SMEs: A study of digital capabilities, innovation, and external environment. *Technology in Society, 79*, 102733. https://doi.org/https://doi.org/10.1016/j.techsoc.2024.102733

Asiri, A. M., Al-Somali, S. A., & Maghrabi, R. O. (2024). The integration of sustainable technology and big data analytics in Saudi Arabian SMEs: A path to improved business performance. *Sustainability, 16*(8), 3209. https://doi.org/https://doi.org/10.3390/su16083209

Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of management, 17*(1), 99-120. https://doi.org/https://doi.org/10.1177/014920639101700108

Canhoto, A. I., Quinton, S., Pera, R., Molinillo, S., & Simkin, L. (2021). Digital strategy aligning in SMEs: A dynamic capabilities perspective. *The journal of strategic information systems, 30*(3), 101682. https://doi.org/https://doi.org/10.1016/j.jsis.2021.101682

Clemente-Almendros, J. A., Nicoara-Popescu, D., & Pastor-Sanz, I. (2024). Digital transformation in SMEs: Understanding its determinants and size heterogeneity. *Technology in Society, 77*, 102483. https://doi.org/https://doi.org/10.1016/j.techsoc.2024.102483

Escoz Barragan, K., & Becker, F. S. R. (2025). Keeping pace with the digital transformation—exploring the digital orientation of SMEs: K. Escoz Barragan and FSR Becker. *Small Business Economics, 64*(3), 1361-1385. https://doi.org/https://doi.org/10.1007/s11187-024-00947-7

Fang, T. M., Ahmad, N. H., Halim, H. A., Iqbal, Q., & Ramayah, T. (2024). Pathway towards SME competitiveness: Digital capability and digital business model innovation. *Technology in Society, 79*, 102728. https://doi.org/https://doi.org/10.1016/j.techsoc.2024.102728

Forum, W. E. (2024). Digital transformation for SMEs: A strategic framework. World Economic Forum. *World Economic Forum*.

Gyamerah, S., Afshari, L., & Asante, D. (2025). Digital transformation in the SME context: The nexus between leadership, digital capabilities and digital strategy. *International Small Business Journal, 43*(3), 303-328. https://doi.org/https://doi.org/10.1177/02662426251314108

Hafeez, S., Shahzad, K., Helo, P., & Mubarak, M. F. (2025). Knowledge management and SMEs' digital transformation: A systematic literature review and future research agenda. *Journal of Innovation & Knowledge, 10*(3), 100728. https://doi.org/https://doi.org/10.1016/j.jik.2025.100728

Held, P., Heubeck, T., & Meckl, R. (2026). Boosting SMEs' digital transformation: the role of dynamic capabilities in cultivating digital leadership and digital culture. *Review of Managerial Science, 20*(5), 1687-1715. https://doi.org/https://doi.org/10.1007/s11846-025-00919-5

Jordan-de-Urries, L., Peinado-García, J., García-Fernández, J., & Cepeda-Carrión, G. (2026). Evolving digital transformation in SMEs: transitioning from outsourcing to internal integration. *Information Systems Journal, 36*(2), 199-213. https://doi.org/https://doi.org/10.1111/isj.70008

Kahveci, E. (2025). Digital transformation in SMEs: Enablers, interconnections, and a framework for sustainable competitive advantage. *Administrative Sciences, 15*(3), 107. https://doi.org/https://doi.org/10.3390/admsci15030107

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*(7), 2011-2038. https://doi.org/https://doi.org/10.1007/s11846-024-00744-2

Kohtamäki, M., Rabetino, R., Parida, V., & Ritala, P. (2025). Strategy in the digitalization era. *International Journal of Management Reviews, 27*(3), 309-323. https://doi.org/DOI: 10.1111/ijmr.12404

Melville, N., Kraemer, K., & Gurbaxani, V. (2004). Information technology and organizational performance: an integrative model of it business value1. *MIS quarterly, 28*(2), 283-322. https://doi.org/ https://doi.org/10.2307/25148636

Monsha'at. (2024). Digital transformation for SMEs. Small and Medium Enterprises General Authority.

Ocloo, E. C., Coffie, I. S., Bukari, Z., & Bashiru, S. (2024). Digitization of small and medium-size restaurant enterprises: the mediating role of owner/manager IT skill and moderating influence of COVID-19. *Cogent Business & Management, 11*(1), 2358549. https://doi.org/https://doi.org/10.1080/23311975.2024.2358549

Rahman, S. A., Taghizadeh, N. S., Tipu, S. A. A., & Far, S. M. (2025). Leveraging dynamic capabilities for digital transformation: Exploring the moderating role of cost in environmental performance of SMEs. *Journal of open innovation: technology, market, and complexity, 11*(2), 100523. https://doi.org/https://doi.org/10.1016/j.joitmc.2025.100523

Saeedikiya, M., Salunke, S., & Kowalkiewicz, M. (2024). Toward a dynamic capability perspective of digital transformation in SMEs: A study of the mobility sector. *Journal of cleaner production, 439*, 140718. https://doi.org/https://doi.org/10.1016/j.jclepro.2024.140718

Sagala, G. H., & Őri, D. (2024). Toward SMEs digital transformation success: a systematic literature review. *Information Systems and e-Business Management, 22*(4), 667-719. https://doi.org/https://doi.org/10.1007/s10257-024-00682-2

Teece, D. J. (2007). Explicating dynamic capabilities: the nature and microfoundations of (sustainable) enterprise performance. *Strategic management journal, 28*(13), 1319-1350. https://doi.org/https://doi.org/10.1002/smj.640

Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic management journal, 18*(7), 509-533. https://doi.org/https://doi.org/10.1002/(SICI)1097-0266(199708)18:7<509::AID-SMJ882>3.0.CO;2-Z

Tripathi, A., & Singh, A. (2024). SMEs awareness and preparation for digital transformation: Exploring business opportunities for entrepreneurs in Saudi Arabia's Ha'il region. *Sustainability, 16*(9), 3831. https://doi.org/https://doi.org/10.3390/su16093831

Vial, G. (2019). Understanding digital transformation: A review and a research agenda. *The journal of strategic information systems, 28*(2), 118-144. https://doi.org/https://doi.org/10.1016/j.jsis.2019.01.003

Wurm, B., Matt, C., Benlian, A., & Hess, T. (2025). A revised framework for digital transformation strategies: Contemporary insights and future research pathways.

Electronic Markets, 35(1), 99. https://doi.org/https://doi.org/10.1007/s12525-025-00838-z.

Yuwono, T., Suroso, A., & Novandari, W. (2024). Information and communication technology in SMEs: a systematic literature review. *Journal of innovation and entrepreneurship, 13*(1), 31. https://doi.org/https://doi.org/10.1186/s13731-024-00392-6

Zhang, M., Chen, X., Xie, H., Esposito, L., Parziale, A., Taneja, S., & Siraj, A. (2024). Top of tide: Nexus between organization agility, digital capability and top management support in SME digital transformation. *Heliyon, 10*(10). https://doi.org/https://doi.org/10.1016/j.heliyon.2024.e31579

Zheng, G., Wang, Q., Qin, Y., Zhang, Z., Huo, B., & Guo, M. (2026). Organizational learning and digitalization capability: Evidence from Chinese SMEs in dynamic environments. *Technovation, 156*, 103618. https://doi.org/https://doi.org/10.1016/j.technovation.2026.103618