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# *Digital Transformation and Business Performance: The Role of Innovation in Small and Medium-Sized Enterprises*

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***Abstract.***

*Digital transformation can change how small and medium-sized enterprises (SMEs) design products, serve customers, organize operations, and create value. Its contribution to performance depends on complementary skills, management practices, resources, and the ability to innovate, rather than technology adoption alone. This narrative review examines relationships among digital capabilities, product and process innovation, business model change, and financial and non-financial performance. It proposes a practical framework linking business objectives, technology use, experimentation, implementation, and evaluation. A graph presents OECD-reported changes in the share of small, medium-sized, and large firms purchasing cloud computing services between 2018 and 2021 across 24 OECD countries. These figures describe adoption trends, not productivity gains or a causal effect of digitalization. The review discusses barriers including limited finance, skills, cyber security, integration costs, and dependence on external platforms. It also considers measurement challenges, potential reverse causality, and variation by sector and national context. SMEs can improve decision-making by starting with a defined problem, tracking relevant outcomes, and assessing the full costs and risks of digital investment. The article is a narrative synthesis and presents no original survey or experimental findings.*

***Keywords:*** *digital transformation, small and medium-sized enterprises, innovation, business performance, digital capabilities*

## 1. Introduction

Small and medium-sized enterprises contribute to employment, local services, supply chains, and innovation. Their resources and organizational structures vary considerably: a family retailer, an engineering workshop, and a software startup may all be classified as SMEs but face different markets and technology needs. Definitions of SME size also differ across jurisdictions. Any analysis of digital transformation should therefore specify the firms, industries, locations, and outcomes being discussed rather than assume that one approach fits all businesses. Digital technologies can help firms communicate with customers, coordinate suppliers, manage inventory, analyze information, and deliver new products or services. However, purchasing software does not automatically change business performance. Employees must learn how to use it, data must be reliable, and workflows may need to be redesigned. Some investments produce uncertain returns, particularly when subscriptions, training, integration, and cyber security costs are overlooked. Digital transformation is best understood as an organizational process rather than

a single technology purchase [1, 2].Innovation provides a potential link between digital capabilities and performance. A firm may use digital information to redesign a process, introduce a new service, or change its revenue model. These changes can improve customer value or reduce costs, but they may also create risks and require experimentation. This article is a narrative review, not a new survey or original empirical study. It presents a practical framework and discusses what is needed to evaluate whether digital innovation benefits SMEs.

**Digital Transformation in the SME Context:**

Digitization often refers to converting information into digital form, such as scanning invoices or recording transactions electronically. Digitalization involves using digital technologies to improve activities, for example by connecting sales records to inventory. Digital transformation is broader: it can involve changes to strategy, organizational processes, customer relationships, and business models. These terms are sometimes used differently in the literature, so studies should explain how they define and measure them.SMEs may benefit from cloud software, online payment systems, customer relationship management tools, e-commerce platforms, digital marketing, and data analytics. A small manufacturer might use connected equipment to monitor maintenance needs, whereas a retailer might prioritize online orders and stock visibility. Technology choices should follow a concrete business objective. A sophisticated tool that employees do not use or that cannot connect to existing records can increase costs without producing useful information. Smaller firms can make decisions quickly and maintain close customer relationships, but they may lack specialist staff, capital, bargaining power, or time for training. External accountants, technology providers, universities, and business associations can help fill some gaps. Dependence on an outside provider also creates questions about pricing, service continuity, data access, and the ability to change suppliers. The balance of benefits and risks differs according to the firm's context [3].

**Innovation as a Pathway to Business Value:**

Product and service innovation involves introducing a new or substantially improved offering. Digital tools can help firms identify customer needs, develop prototypes, obtain feedback, and deliver services through additional channels. For example, a maintenance company might introduce remote appointment booking and a follow-up service based on equipment records. The innovation is the improved customer offering and supporting process; the software is an enabling tool. Customer adoption and service quality determine whether the idea creates value. Process innovation changes how an organization produces, delivers, or supports its products. A business may connect purchasing and inventory records to reduce manual reconciliation, or use a shared scheduling system to coordinate staff. Benefits might appear as shorter lead times, fewer errors, less waste, or improved delivery reliability. These outcomes should be compared with the costs of implementation and any disruption. A process can become faster while creating new problems if data are inaccurate or staff work around the system. Business model innovation changes how a firm creates, delivers, or captures value. A retailer might add online sales and home delivery; a manufacturer might offer subscription-based maintenance alongside equipment sales. Research on innovative SMEs has examined business model innovation as a mediator between digital transformation and performance [4]. Such findings are useful for developing hypotheses, but a statistical association or mediation model in a particular sample does not by itself prove that the same pathway will cause higher profits in every SME.Innovation also includes organizational learning. Employees can test a small change, observe whether it helps customers or reduces errors, and adapt the process before wider rollout. A firm that treats each technology decision as an experiment can learn from unsuccessful trials as well as successful ones. Management must provide time, feedback, and clear responsibilities so that experimentation does not become a collection of disconnected software projects.

**Digital Technologies and Operational Performance:**

Cloud computing can give smaller firms access to software and storage without maintaining all infrastructure in-house. Applications for accounting, sales, scheduling, and collaboration may be purchased as services. Benefits depend on connectivity, reliability, data quality, and the ability to integrate systems. Firms should understand subscription terms, backup arrangements, access permissions, and how to export data if they change providers. Lower initial expenditure does not guarantee a lower total cost over the lifetime of a service. The OECD reported that the share of small firms purchasing cloud computing services increased by 13.6 percentage points between 2018 and 2021 on average across 24 OECD countries. The corresponding increases were 16.1 percentage points for medium-sized firms and 16.8 for large firms [5]. These values are changes in adoption rates, not the shares of firms using cloud services and not estimates of productivity or revenue growth. They show that technology use increased across the groups in the period studied, while the OECD also noted a remaining gap between small and large firms.

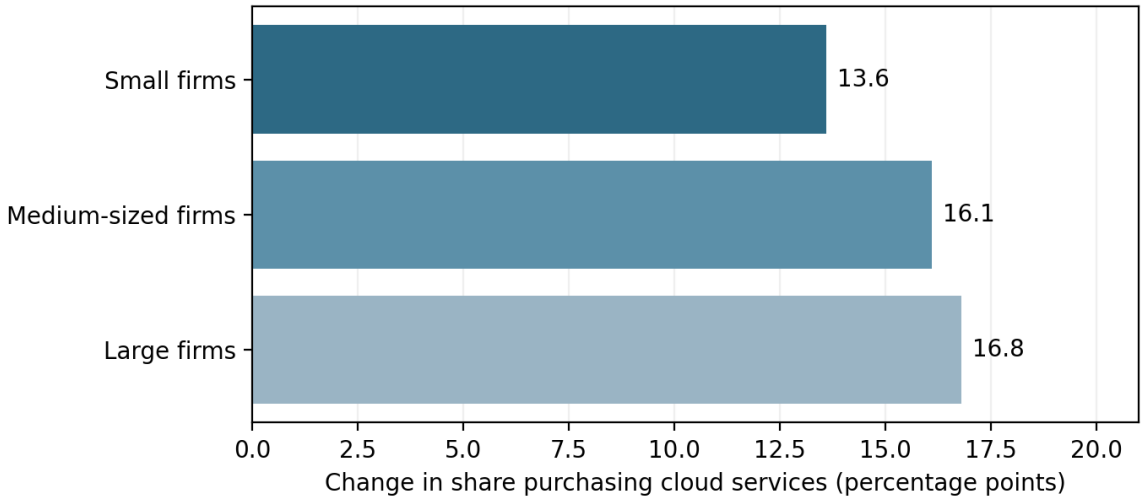



**Figure 1 OECD-reported change in the percentage of firms purchasing cloud computing services between 2018 and 2021, averaged across 24 OECD countries [5]. Values are percentage-point changes, not current adoption rates or performance effects.**

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E-commerce can expand a firm's reach, but additional sales channels also require reliable fulfillment, customer service, returns handling, and accurate stock information. Marketplace fees and dependence on a platform may reduce margins even when sales volume rises. A useful evaluation tracks contribution margin, repeat purchases, delivery performance, and customer acquisition cost alongside revenue. For some businesses, a simple online catalogue linked to existing operations may be more valuable than a complex platform. Digital records and analytics can reveal patterns in sales, production, or customer demand. Forecasting can support purchasing and staffing, but forecasts are only as useful as the data and assumptions behind them. Historical sales may be distorted by stock outs, seasonal events, or changes in prices. Managers should compare forecasts with actual outcomes, document uncertainty, and retain a process for human review. Access to more data does not automatically produce better decisions.

**Business Performance and Measurement:**

Business performance has financial and non-financial dimensions. Financial indicators may include revenue, gross margin, operating costs, cash flow, and return on investment. Non-financial indicators can include delivery time, error rates, customer satisfaction, employee skills, and product development speed. The right measures depend on the objective of the digital initiative. A business seeking to reduce order errors should measure errors and the cost of

correcting them, not only website visits or the number of software licenses purchased. A realistic evaluation considers the full cost of implementation. Costs can include software subscriptions, hardware, staff time, data migration, training, consulting, cyber security, downtime, and ongoing support. Benefits may emerge gradually and can be affected by unrelated changes in the economy or market. A simple before-and-after comparison can be informative, but it should not be treated as proof that the technology caused every observed improvement. A comparison group, phased rollout, or repeated measurements can strengthen the assessment. Performance measures can conflict. Faster service may increase labor pressure, and higher online sales may be offset by delivery costs or returns. Automation can reduce a repetitive task while creating new work in data entry or exception handling. Managers should review outcomes across customers, employees, and finances rather than optimize a single indicator. Regular review also allows the firm to stop or modify a project when the expected benefits do not materialize.

**A Framework Linking Digital Transformation, Innovation and Performance:**

The framework proposed in this review begins with a defined business problem and a baseline. The SME identifies an outcome such as late deliveries, frequent stock outs, or difficulty reaching customers and records how the process currently performs. It then assesses available skills, data quality, budget, and technology infrastructure. This first stage helps distinguish a genuine operational need from interest in a tool that may not address a priority. The second stage selects a digital capability and an innovation opportunity. A capability may be a shared inventory database or an online booking system; the innovation is the redesigned process, service, or business model enabled by its use. Employees and customers should be involved in identifying practical requirements. A small pilot can test whether the new workflow is usable and whether information moves correctly between systems before the firm commits to full deployment. The third stage measures results and adjusts the design. For example, a firm introducing digital inventory records can compare stock accuracy, stock out frequency, time spent on reconciliation, and total implementation cost with the baseline. If errors increase because staff enters data twice, the process may need integration or additional training. The framework does not assume that the expected innovation will occur or that every outcome will improve. It treats learning and revision as part of the investment. The final stage decides whether to scale, modify, or discontinue the initiative. A successful pilot should be assessed for durability, security, and the capacity to support additional users or locations. A failed pilot can still provide useful evidence about customer needs, workflow constraints, or supplier limitations. The framework is conceptual; it is not presented as an experimentally validated causal model.

Table 1 Digital capabilities, innovation opportunities and performance measures

| Digital capability | Possible innovation | Illustrative measure |
|---|---|---|
| Cloud accounting and inventory | Connect sales, purchasing and stock records | Stock accuracy and reconciliation time |
| E-commerce platform | Add online ordering and delivery | Contribution margin and repeat purchases |
| Customer relationship tools | Develop targeted service and follow-up | Retention and complaint resolution time |
| Production monitoring | Improve maintenance or scheduling | Downtime and on-time delivery |
| Data analytics | Test new products or demand forecasts | Forecast error and new-product sales |

**Organizational Capabilities and Leadership:**

Leadership influences how a firm chooses priorities, allocates resources, and responds to setbacks. In a small business, the owner may be responsible for both strategic decisions and daily

operations, leaving little time for a transformation project. A clear objective and a designated person responsible for implementation can help. Leadership also includes listening to employees and customers who understand the work that the new system is intended to improve. Digital skills extend beyond operating software. Staff need to understand data quality, privacy, cyber security, and how new workflows affect their responsibilities. Training should be tailored to actual tasks and supported after implementation, when problems become visible. A system that requires complex data entry may fail if employees are not given enough time or if the benefits of accurate records are unclear. Involving users early can reveal practical constraints and reduce resistance. Dynamic capabilities are often described as the ability to sense opportunities, act on them, and adapt resources as conditions change [6]. In an SME, this may mean recognizing a shift in customer demand, testing a new delivery channel, and reallocating staff or equipment. The concept helps explain why two firms using similar technology can obtain different results. It should not be treated as a guarantee that every adaptation will succeed; management choices and external conditions also matter.

**Barriers, Risks and Contextual Differences:**

Financial constraints can limit investment, particularly when benefits are uncertain and payback is delayed. A subscription may appear affordable but become expensive as users, data storage, or transaction fees increase. Smaller firms may also struggle to compare vendors or negotiate contracts. A phased implementation and a clear estimate of total cost can reduce uncertainty, but they do not eliminate the risk of an unsuitable investment. Access to finance should be paired with advice and skills development.Cybersecurity and privacy are essential because digital systems hold customer, employee, and financial information. Common risks include weak passwords, phishing, lost devices, and excessive access permissions. Practical controls include multi-factor authentication, updates, backups, access reviews, and staff training, adapted to the firm's needs. A cloud provider may secure part of the infrastructure, but the business remains responsible for many account and data-management practices. Applicable legal duties vary by jurisdiction. Integration is a common challenge. An online shop, accounting system, and delivery service may each use different product identifiers or customer records. Manual copying between them can create errors and increase workload. Before adoption, a firm should identify which systems must exchange data, test the connection, and check what happens when a transaction fails. Contracts should specify data ownership, export options, and support so that the business is not unable to recover its information. Digital transformation also varies by sector and location. A rural enterprise may face unreliable connectivity, while a regulated service provider may need additional controls over sensitive data. Customer preferences, payment systems, logistics infrastructure, and language can influence adoption. Policies or case studies from one country should not be transferred automatically to another. Local conditions and the needs of the firm's customers should guide decisions.

**Evidence, Research Design and Policy Implications:**

Empirical research has identified relationships between digital transformation, innovation, and SME performance, but studies differ in their definitions and methods. Some rely on manager-reported surveys collected at a single point in time, while others use administrative records or longitudinal data. A positive association may reflect the fact that more successful firms have greater resources to invest in technology, rather than technology alone causing success. Selection effects and reverse causality should be considered when interpreting results. Research on innovative SMEs has examined business model innovation as a potential pathway linking digital transformation with performance [4]. Other studies have investigated technology adoption and business model change in specific national contexts [7]. These findings support further investigation, but results from a selected sample cannot be assumed to apply to all SMEs. Studies should report sector, firm size, country, time period, measures, and uncertainty, and distinguish

measured outcomes from perceived improvements. Policy support can address barriers through access to connectivity, practical training, advisory services, and financing. Programs should be designed around business needs and evaluated for outcomes, not simply the number of grants or workshops delivered. Support can also help firms assess cyber security and choose interoperable systems. Different types of enterprise may require different forms of assistance, and public programs should avoid favoring technology adoption without evidence of business value. Future research can use longitudinal data, carefully designed comparisons, and mixed methods to examine how organizational change unfolds over time. Interviews can explain how managers and employees use technology, while operational and financial records can test whether proposed benefits occur. Studies should examine failures, delayed effects, and differences across sectors as well as successful cases. Better evidence can help SMEs decide when digital innovation is worth the investment.

**Implementation Priorities and Future Directions:**

A practical implementation sequence starts with one important business problem and a measurable baseline. The firm then selects a tool that fits the process, tests it with a small group, and trains the people who will use it. It should document both expected benefits and total costs before expanding. A periodic review can check whether the system remains useful, secure, and affordable as the business grows or market conditions change. Customer input is important when digital transformation changes how products are ordered, delivered, or supported. Online channels should be accessible and easy to use, and alternatives may be needed for customers who prefer personal contact. Complaints and service delays can reveal problems that sales figures alone do not show. The objective is to improve the customer experience and the business process together rather than simply add another channel. Emerging AI tools may help SMEs summarize information, support customer service, or analyze records, but they can also produce incorrect outputs or expose sensitive information. Firms should define permitted uses, review outputs for important decisions, and evaluate whether the time saved exceeds the cost of checking and correcting errors. The appropriate use depends on the task, the quality of available data, and the consequences of mistakes. Sustainable implementation includes staff well-being and business continuity. If a digital system fails, employees need a way to process essential orders or recover records. Backups, clear responsibilities, and realistic workloads reduce disruption. Technology can support innovation when it is combined with learning, reliable processes, and attention to the people who use i.e. small enterprise can begin evaluating digital investment with a simple record of time, errors, and customer outcomes. For instance, an owner might record how many orders require correction during several weeks before introducing an inventory system. The same definition should be used after implementation, while noting changes in sales volume or staffing. If errors fall but the number of orders also declines, the result may not be attributable to the system. A rate per order and a record of implementation costs provide a more informative comparison than a raw count alone. An innovation may create value for a customer without immediately increasing profit. Online booking can make a service easier to access, but its initial cost and staff training may exceed short-term revenue gains. The firm should decide how long it is willing to test the service, which customers it intends to reach, and what evidence would justify continuing. Customer feedback and completed bookings provide useful early signals, while financial outcomes need enough time to reflect recurring costs and changes in demand. Innovation can also emerge from relationships with suppliers and larger customers. Shared digital records may improve order visibility or reduce repeated paperwork across organizations. These arrangements can require changes to product identifiers, data formats, and responsibilities for correcting errors. A small supplier should understand what information it is required to share, whether it can access its own records, and the costs of joining a platform. A useful partnership improves coordination without making the smaller firm unable to serve other customers or

change systems. For employees, successful transformation often depends on the details of daily work. A new application may shift responsibility for data entry from an administrator to front-line staff, or require workers to manage exceptions when automated processes fail. Managers should observe these changes and measure the time they take. Training can include short practice sessions using real tasks, followed by opportunities to report problems. Recognizing employee suggestions can improve both system design and acceptance, especially when staff understands that feedback will lead to action. A business model change should be tested for operational feasibility as well as market demand. Introducing a subscription, for example, requires reliable billing, customer support, and a clear method for cancellation. The business needs to understand recurring service costs and whether revenue covers them over time. A small pilot with a defined customer group can reveal issues before the offering is expanded. These examples are illustrative and should not be confused with measured results from an empirical study. Finally, managers should plan for changes in technology providers and market conditions. A service may change its pricing, discontinue a feature, or experience an outage. Maintaining documented procedures, accessible exports, and tested backups can reduce dependence on a single provider. Periodic review should ask whether the tool still supports the original business objective, whether customers and staff can use it effectively, and whether a simpler alternative would deliver comparable value. Responsible digital transformation is an ongoing management process rather than a one-time project.

**Summary:**

Digital transformation can support SME performance by enabling improvements to products, processes, customer relationships, and business models. Innovation is a potential pathway from technology use to value, but the result depends on skills, leadership, data quality, costs, and the business environment. Technology adoption alone does not establish a causal performance gain.

The OECD graph describes changes in cloud-service purchasing between 2018 and 2021; it does not measure business performance. SMEs can assess digital projects by defining objectives, measuring a baseline, testing changes, tracking costs and benefits, and reviewing risks. This narrative review proposes a practical framework and reports no new empirical study.

**References:**

Vial G. Understanding digital transformation: A review and a research agenda. Journal of Strategic Information Systems. 2019;28:118–144. https://doi.org/10.1016/j.jsis.2019.01.003

Verhoef PC, Broekhuizen T, Bart Y, et al. Digital transformation: A multidisciplinary reflection and research agenda. Journal of Business Research. 2021;122:889–901. https://doi.org/10.1016/j.jbusres.2019.09.022

OECD. The Digital Transformation of SMEs. OECD Publishing; 2021. https://doi.org/10.1787/bdb9256a-en

Merín-Rodrigáñez J, Dasí À, Alegre J. Digital transformation and firm performance in innovative SMEs: The mediating role of business model innovation. Technovation. 2024;134:103027. https://doi.org/10.1016/j.technovation.2024.103027

OECD. OECD SME and Entrepreneurship Outlook 2023. OECD Publishing; 2023. https://www.oecd.org/en/publications/oecd-sme-and-entrepreneurship-outlook-2023_342b8564-en/full-report/component-5.html

Teece DJ. Explicating dynamic capabilities: the nature and microfoundations of sustainable enterprise performance. Strategic Management Journal. 2007;28:1319–1350. https://doi.org/10.1002/smj.640

Digital transformation in small and medium-sized enterprises: business model innovation and information technology adoption—the case of Austria. International Journal of

Entrepreneurship and Small Business. 2023;48:318–342. https://doi.org/10.1504/IJESB.2023.129294

The effect of digitally-driven business model innovation on business performance. Journal of Small Business & Entrepreneurship. 2023. https://doi.org/10.1080/08276331.2023.2239039

Prakasa Y, Jumani ZA. Linking digital capability to small business performance: the mediating role of digital business transformation. Cogent Business & Management. 2024. https://doi.org/10.1080/23311975.2024.2342486

OECD. SME Digitalisation to Manage Shocks and Transitions. OECD Publishing; 2024. https://www.oecd.org/content/dam/oecd/en/publications/reports/2024/09/sme-digitalisation-to-manage-shocks-and-transitions_735fc44d/eb4ec9ac-en.pdf

OECD. Generative AI and the SME Workforce: New Survey Evidence. OECD Publishing; 2025. https://doi.org/10.1787/2d08b99d-en

Bharadwaj A, El Sawy OA, Pavlou PA, Venkatraman N. Digital business strategy: Toward a next generation of insights. MIS Quarterly. 2013;37:471–482. https://doi.org/10.25300/MISQ/2013/37:2.3