

# Challenges and Strategies for Technological Integration in SMEs: A Midwest Multisectoral Case Study

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## ABSTRACT

Small and mid-sized enterprises (SMEs) recognize the necessity of integrating technology to stay competitive. However, they face different challenges to implement new technologies. This study presents a multiple case study of the challenges faced by four small and medium-sized enterprises (SMEs) in the Midwest from various sectors regarding technological implementations. Results show that some SMEs in the Midwest deal with outdated IT infrastructure, lack of staff training, low staff digital adaptability, lack of management commitment to updating systems, and financial constraints. Government and supporting agencies can find this information useful to prepare supporting programs to address those specific challenges and allow SMEs in the Midwest to continually improve their business performance by enhancing their digital technologies.

**Keywords:** small and mid-sized enterprises (SMEs), multisectoral analysis, multi-case study, technological challenges, digital technologies.

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## INTRODUCTION

Nowadays, to remain competitive, small and mid-sized enterprises (SMEs) use digital technologies to facilitate strategic and operational changes across their departments (Li, 2020). According to Ranawat (2023), digital technologies (DTs) are used to improve company processes and create new capabilities and business models. DTs are used as a bridge to connect different areas within an organization and support the long-term goals of the organization (Ranawat, 2023). At the same time, DTs provide more resources and capabilities for innovation, creating a competitive advantage for any company (Liu et al., 2023). These pervasive benefits, including increased productivity, enhanced product and service quality, higher employee engagement, increased sales, and reduced corporate costs, have driven the implementation of digital transformations across various industries (Lund et al., 2021; Moussa & Tarek, 2023).

However, as stated by Li (2020), these SMEs usually face many challenges such as a lack of digital skills among employees, inadequate infrastructure, and customer and supplier-related issues that keep them from embracing technology. Also, SMEs lack significant capital to invest in digital technology (Priyono et al., 2020) which limits the adoption of DTs. Moreover, DTs bring unprecedented challenges to SMEs due to their simultaneous and shorter introduction cycles (Liu et al., 2024).

This study helps to identify the most common challenges connecting with the managers' experiences and provides recommendations for a successful DT implementation. The information from four different companies operating in different industries is presented using a multiple-case approach.

## LITERATURE REVIEW

The implementation of DT has become imperative for SMEs across various industry sectors (Díaz-Arancibia et al., 2024). In many cases, DT involves reevaluating the way of doing business and selecting the elements to leverage to redefine their competitive advantage (Correani et al., 2020). Some of these elements are the workforce, technology infrastructure, cultural practices, and broader social and organizational structures (Díaz-Arancibia et al., 2024). Due to this complexity, almost 84% of DT projects fail (Correani et al., 2020).

Díaz-Arancibia et al. (2024) listed some of the technological barriers affecting DT implementation in SMEs and across different industries. The authors mentioned a lack of digital skills, financial limitations, organizational resistance, technological issues, and external factors. Through a cross-sector comparison of the specific challenges and by using a multiple-case approach, this study presents the differences and similarities in the challenges SMEs face during DT implementation facilitating the understanding of this complex phenomenon (Urbinati et al., 2020).

## METHODOLOGY

The paper adopts an exploratory multiple-case study design, assessing four different cases of SMEs operating in different industries in the Midwest of the U.S. According to Creswell and Poth (2018), case study research can be used as a qualitative approach to “explore a real-life, contemporary bounded system (a case) or multiple bounded systems (cases) over time” and through “data collection involving multiple sources of information.” (p.153). According to Yin

(2003), a case study analysis allows for answering ‘how’ and ‘why’ questions. In this study, a multiple case study analysis was conducted to collect and analyze data from multiple SMEs operating in different industries and gather common as well as different perspectives on the issue (Creswell & Poth, 2018). A multiple-case study allows for cross-case comparison, providing insights into the differences and similarities between multiple cases (Urbinati et al., 2020). The authors followed the procedure Urbinati et al. (2020) recommended in identifying the case studies, data gathering, and data analysis. Analyzing the literature on DT challenges faced by SMEs allowed the authors to formulate specific questions for the respondents.

The information gathered from the key respondents was triangulated with secondary sources, such as company reports and website information (Yin, 2003). To maintain the anonymity of the companies under this study, the cases are named “Case A,” “Case B,” “Case C,” “Case D,” and “Case E.” Table 1 (Appendix), shows the key information about the cases.

The cases are relevant as they provide perspectives from different industry sectors. The overarching research question for this study is: What are some of the challenges faced by Small and Medium-Sized Enterprises when implementing digital technologies?

## **PARTICIPANTS**

The identification of the cases was based on a convenient sampling criterion based on the relevance to the research questions and the easy accessibility and availability of information at a given time (Voss et al., 2002). Particularly, the criteria for the case selection for the research included: (i) size of the case study, whereby case studies are homogeneous from the point of view of the revenues dimension, mainly small and medium-sized enterprises; (ii) region, whereby case studies are homogeneous from the point of view of the region of activity within which they operate, SMEs in the Midwest (Urbinati et al., 2020).

In this study, four SMEs located in the Midwest were selected. The sectors include communication, child development, interior construction and manufacturing, and cleaning equipment. The SMEs have been operating for 7 to 70 years and have 7 to 60 employees.

## **DATA GATHERING**

A semi-structured interview protocol with open-ended questions was prepared for the participant managers who were previously identified (Galleta, 2013). These managers were chosen based on their knowledge and active role during the challenges faced during digital implementations. Each SME was presented with a survey related to understanding the challenges of implementing a digital strategy. The survey included open-ended qualitative questions to collect responses from employees and leading managers. The following analysis addresses a gap in the literature by providing direct insights into the challenges faced by SMEs about technological implementations.

## **REPORTING**

The qualitative data gathered detailed responses through inquiries directly related to the study's purpose, enabling researchers to address participants' experiences (Creswell & Poth, 2018; Galleta, 2013). For example, one question stated, “What will you say are the challenges

you are facing that prevent a digital transition for the company?” Table 2 (Appendix) provides information about the challenges of implementing DT and how the company is affected. An additional column shows the strategic recommendation to overcome that specific situation.

## CASE STUDIES

Case A is a trans-media communication company. It is family-owned and has been in the market for the last 13 years, with a total headcount of 12 employees. Case A has established a well-known reputation in marketing by offering a range of services, including public relations, marketing, content creation, and digital strategy.

Case B is a child development educational institution founded in 2017. Based on its family-oriented approach to child development, the company has expanded to three locations in the Midwest and employs about 60 staff members.

Case C is a construction and manufacturing company that has been in operation for eleven years. It employs about seven staff members and provides turnkey solutions for custom interiors.

Case D has been in the cleaning equipment and supplies industry for over 59 years and employs 25 staff members.

## RESULTS

Table 2 (Appendix) shows the digital challenges reported by each case, how the company is affected, and the strategic recommendations provided.

## DISCUSSION

SMEs usually have restricted access to particular resources compared to big organizations (Ghobakhloo et al., 2011). Case A reported IT infrastructure gaps in its financial system. As the manager from Case A commented, “Currently [we] use QuickBooks, but we have a very old desktop version of QuickBooks.” Zamani (2022) highlighted that SMEs with better IT infrastructure have a higher success rate in adopting new technology. Later, Zamani (2022) added that SMEs with a gap in their financial systems cannot integrate with providers’ systems and perform data-driven decisions. However, cloud accounting systems offer many advantages to SMEs, such as data security, data accessibility from everywhere, low maintenance costs, data accuracy, and flexible and scalable operations (Saad et al., 2022). As the manager from Case A confirmed, transitioning to QuickBooks Online will improve the company’s “operational efficiency and competitiveness.”

For Case B, staff training and digital adaptability are their most critical challenges. The manager from Case B mentioned, “Some staff members may resist the [DT] transition due to comfort with existing systems or fear of new technology.” Saka (2020) confirmed that the lack of employees’ digital knowledge is a major barrier to technology implementation. Similarly, Adekunle et al. (2023) reported the lack of required skills in technology as a major barrier associated with the resistance to learning and adapting to new technologies. Furthermore, employees need to develop specific skills and capabilities to fully seize the opportunities that digital technologies bring to the organization (Correani et al., 2020). In this regard, a customized

training plan can be prepared to identify the right skills and subjects to address, supporting the SMEs' digital transition (Azevedo & Almeida, 2021). This training can be combined through the integration of immersive technologies (e.g., virtual and augmented reality), which have been demonstrated to be efficient and effective in overcoming learning limitations and fostering the development of practical skills (Orozco & Giraldo-García, 2024).

The lack of management commitment to updating customer purchasing systems was considered a challenge in Case C. Nguyen et al. (2012) stated that the decision to adopt CRM technology highly depends on the involvement and commitment of SMEs' managers. Similarly, Li (2020) reported that despite the benefits that DT brings to the organization, resistance from stakeholders is sometimes common and unavoidable. For Case C, being unable to track customer information presents disadvantages when trying to retain customers and improve their spending. The manager from case C stated, "I don't have any central list of all of our clients from the last year, who they were." Raj et al. (2016) mentioned that although some customer relationship management systems present relatively high costs for SMEs, the benefits of generating real-time reports, improving the decision-making process, and enhancing customer loyalty are worth the investment.

Case D reported the condition of an outdated IT infrastructure, including hardware, software, and network access. This gap in the infrastructure prevents employees from using some of the systems at full capacity. This is consistent with Zamani (2022), who reported that SMEs facing these challenges cannot meet the technical requirements of implementing new applications and, therefore, cannot support the organization in reaching its goals. Implementing new IT infrastructures opens up opportunities for innovation, allowing employees to get tailored training on the capabilities of the latest technologies (Azevedo & Almeida, 2021; Ramdani et al., 2022). Financial constraints were also mentioned as a barrier for Case D. Adekunle et al. (2023) reported financial support as one of the major barriers for SMEs to adopt DTs. Under this situation, the company must continue operating with the same outdated IT infrastructure losing business opportunities. As the manager from Case D confirmed, "The necessity of upgrading hardware simultaneously with the software has led to postponements due to financial constraints." Interestingly, Case D identified staff training and digital adaptability as challenges, as reported by Case B.

## CONCLUSIONS

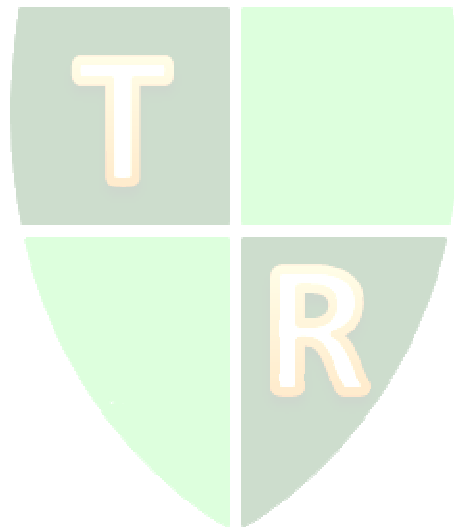
This paper aims to report different challenges that prevent SMEs in the Midwest from implementing digital technologies into their processes. The major challenges identified in this study are IT infrastructure gaps in the financial system, lack of staff training and digital adaptability of employees, the lack of management commitment to updating customer purchasing systems, outdated IT infrastructure, and financial constraints. These challenges are presented at all levels of the organization as managers present resistance to change, and employees show a lack of digital knowledge. An outdated IT infrastructure presents a significant challenge for organizations, limiting the effective implementation of digital technologies across all departments. Financial and customer purchasing systems were mentioned as key developments for some SMEs, confirming the focus on maintaining a good track of financial transactions and nurturing customer relationships. Some recommendations were provided to mitigate each of these challenges. This study offers evidence on some of the critical factors that influence successful DT implementations in SMEs Further research is invited to better

understand the specific impact of these challenges on the organization and assess the long-term impacts of DT on SMEs in different sectors.

Although these SMEs in the Midwest recognize the benefits that digital transformation could bring, the challenges listed present substantial obstacles that affect their ability to embrace this transformation. Interestingly, some of the SMEs mentioned that Artificial Intelligence (AI) would positively impact the growth of their business operations. However, they mentioned concerns about AI vendors using their information to train their models.

### **IMPLICATIONS FOR PRACTICE**

The identified challenges underscore the importance of strategic planning in these SMEs' digital transition. Addressing these challenges will facilitate a smoother digital transition, ensuring that SMEs remain competitive and can leverage new technologies for growth and innovation. Government and supporting agencies can find this information useful in preparing supporting programs to address those specific challenges and allow SMEs in the Midwest to continually improve their business performance by enhancing their digital technologies.





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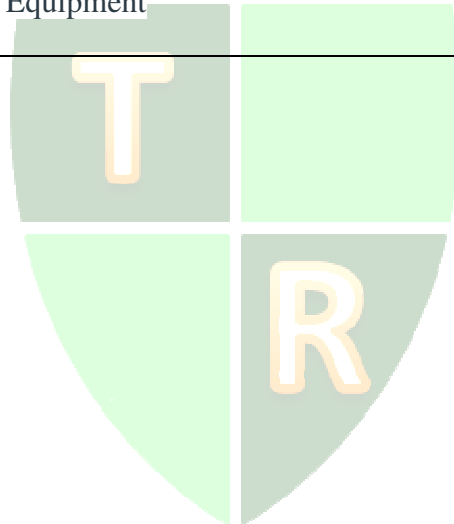
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## APPENDIX

**Table 1. Midwest Company Profiles.**

Case	Industry	Years of Operation	Employees
A	Communication	13	12
B	Child Development	7	60
C	Interior Construction & Manufacturing	11	7
D	Cleaning Equipment	59	25



**Table 2. Challenges Faced by Midwest Companies.**

Case Company	Digital Challenge	How Company is Affected	Strategic Recommendation
Case A	<ul style="list-style-type: none"> <li>IT infrastructure gaps in the financial system.</li> </ul>	<ul style="list-style-type: none"> <li>Unable to integrate with providers' systems.</li> <li>Unable to perform data-driven decisions.</li> <li>Disconnection between customer employee and experience.</li> </ul>	<ul style="list-style-type: none"> <li>Implement a cloud-based accounting software solution</li> </ul>
Case B	<ul style="list-style-type: none"> <li>Staff training and Digital Adaptability</li> </ul>	<ul style="list-style-type: none"> <li>Keeping legacy systems</li> <li>Not able to transition to new technologies Lack of innovation on internal processes.</li> </ul>	<ul style="list-style-type: none"> <li>Provide customized training programs on digital learning</li> <li>Encourage employees to embrace technology to remain competitive</li> </ul>
Case C	<ul style="list-style-type: none"> <li>Lack of management commitment to updating customer purchasing systems.</li> </ul>	<ul style="list-style-type: none"> <li>Order entry process is time-consuming and error-prone.</li> <li>Inefficient order processing and tracking.</li> </ul>	<ul style="list-style-type: none"> <li>Implement a Customer Relationship Management System</li> </ul>
Case D	<ul style="list-style-type: none"> <li>Outdated IT infrastructure.</li> <li>Financial Constraints</li> <li>Staff training and Digital Adaptability</li> </ul>	<ul style="list-style-type: none"> <li>High operational inefficiencies and low customer service satisfaction.</li> </ul>	<ul style="list-style-type: none"> <li>Update the IT systems.</li> <li>Provide Customized training programs on digital learning</li> </ul>