

# **Digital Business Transformation Adoption in SMEs and Large Firms during COVID-19**

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## **Abstract**

The COVID-19 pandemic has presented significant challenges for businesses worldwide. Those who recognized the importance of an online presence and transformed their traditional business model into a digital one were better equipped to mitigate the pandemic's negative impacts. However, there is a lack of research on the differences in digital transformation between small and medium-sized enterprises (SMEs) and large firms, as well as the main factors driving this transformation. This paper aims to address this gap by examining the successful digital transformation among these groups (SMEs and Large firms) in the province of New Brunswick, Canada, as a case study. The study uses secondary data from the TechImpact survey to explore the primary factors of this shift for both SMEs and large firms. The study confirms the critical factors identified in the literature, while also revealing new factors specific to each group. For SMEs, these include adopting a digital business model, investing in low-budget social media and e-marketing, recruiting young digital experts, and accessing government grants and subsidies. For large firms, the factors include implementing mass customization through online channels, providing remote work incentives, using a comprehensive content management system, and prioritizing electronic customer relationship management and e-loyalty.

Keywords: COVID-19; Digital Business Transformation; SMEs; Large Firms

## Introduction

Digital transformation involves the integration of digital technology into all areas of business operations, including communication, customer service, marketing, and sales (Sousa & Rocha, 2019). With the rapid advancement of technology, businesses that fail to adapt to the digital age risk becoming obsolete (Al-debei et al., 2008; Vrontis et al., 2022). By identifying the factors that influence its adoption, businesses can make informed decisions (Li, 2021; Nadkarni & Prügl, 2021) about their digital transformation strategies and stay competitive in an increasingly digital world.

The COVID-19 pandemic has forced businesses worldwide to adopt new management strategies across all aspects of their organization (Doyle & Conboy, 2020; UNIDO (United Nations Industrial Development Organization), 2020), including sales, operations, marketing, customer relationship management (CRM), and supply chain management (SCM) (Alshamsi et al., 2020; Amankwah-amoaah et al., 2021). Small- and medium-sized enterprises (SMEs) have responded differently compared to larger firms (Klein, 2021), highlighting the importance of understanding the similarities and differences in adopting new methods, processes, and communication channels during crises.

Numerous scholars have explored the initiatives of a digital business transformation in response to COVID-19 (Barnes, 2020; Dragan, 2021; Fletcher & Griffiths, 2020; Iivari et al., 2020; Pan & Zhang, 2020; Stankiewicz, 2021; Wade & Shan, 2020), but there is a gap in the literature concerning the main factors driving this transition in SMEs and large businesses, as well as their success and failure indicators. This paper aims to fill this gap by identifying the critical factors driving the digital transformation of businesses in the province of New Brunswick, Canada, during the pandemic, with a focus on SMEs and large firms. In pursuit of this objective, the primary research questions are as follows:

- What are the key factors that contribute to the successful digital business transformation of SMEs and large firms in New Brunswick, Canada?
- To what extent does digital transformation influence the firm performance of SMEs and large firms?

These research questions guide the investigation into the factors that drive successful digital transformation initiatives and their impact on various aspects of business outcomes. By addressing these research questions, the study aims to provide insights that could inform strategic decisions and policies for organizations undergoing or planning to undergo digital business transformation during the challenging context of unexpected circumstances. By ranking the identified factors and examining their impact on firm performance, a deeper understanding of the underlying mechanisms through which digital business transformation drives organizational outcomes can be achieved. This additional research objective allows for the identification of critical factors, their relative significance, and the specific pathways through which they influence performance.

Furthermore, understanding the extent to which digital business transformation influences firm performance contributes to the ongoing discussions surrounding the benefits and outcomes

associated with digital transformation initiatives. Valuable insights can be gained from this analysis, aiding practitioners and policymakers in developing strategies and interventions that maximize the positive impacts of digital business transformation.

Conducting a case study in a dynamic region can reveal key insights and aid future research in identifying practical trends. This paper selects the New Brunswick province in Atlantic Canada as a case study to investigate the performances of SMEs and large firms during the pandemic in transitioning to a digital business model. New Brunswick spent \$1B on pandemic relief, which is lower than the average of other provinces in Canada; however, it has outperformed most provinces in terms of business revitalization, according to a new analysis by the Royal Bank economists (Hogue, 2021; Jones, 2021). This success is attributed to the digital transformation in SMEs and large firms in the province, as reported by TechImpact (2020). Thus, this paper examines the essential factors in the digital business transformation in New Brunswick using the province-wide survey results conducted by TechImpact in 2020.

The rationale for using survey results from TechImpact is based on several factors. First, TechImpact is a reputable research organization that conducts comprehensive surveys on the performance of businesses in New Brunswick. While there may be other reporting agencies conducting similar surveys, TechImpact stands out due to its focus on the digital business transformation domain and its specific relevance to the context of New Brunswick. The TechImpact survey is designed to capture the unique challenges and opportunities faced by businesses in New Brunswick, making it a suitable source of data for this study.

While we have not explicitly applied any particular theory or framework in our analysis such as TOE (Technology-Organization-Environment) (Singeh et al., 2020), TAM (Technology Acceptance Model) (Robles-Gomez et al., 2021), or UTAUT (Unified Theory of Acceptance and Use of Technology) (Alghatrifi & Khalid, 2019), the review of the existing literature includes a range of conceptual and theoretical frameworks related to digital business transformation. These frameworks encompass various factors and dimensions that have been identified as influential in the adoption and success of digital business transformation initiatives.

## **Literature review**

In conducting the literature review, the authors employed a systematic approach to ensure a comprehensive and rigorous examination of the existing framework for digital business transformation (Figure 1). This paper utilized one of the most relevant databases, Scopus, which is widely a recognized source of scholarly literature in various disciplines.

The search strategy involved using a combination of keywords related to digital business transformation, organizational change, technology adoption, and related concepts. The authors also utilized Boolean operators to refine and narrow down the search results. The initial search yielded a substantial number of articles and papers.

To ensure the inclusion of high-quality and relevant literature, the authors established specific inclusion and exclusion criteria. The main focus was on peer-reviewed journal articles,

conference papers, and authoritative reports published in the last 10 years. The selected literature was primarily from reputable journals in the fields of business, management, and information systems.

### **Figure 1 – The selection criteria for the literature review**

The screening process involved a careful examination of titles, abstracts, and keywords to identify articles that aligned with the research objectives. Full-text articles were then reviewed and assessed for their relevance to our study. The authors paid particular attention to articles that presented frameworks, models, and key factors relevant to digital business transformation.

The success of a digital business strategy is determined by “the extent to which a firm engages in any category of information technology (IT) activity” (Mithas et al., 2013, p. 513). In another paper, Mithas, Agarwal, and Courtney (2012) identified key components of a digital business strategy as thriving on digital uncertainty, focusing on a new game, continuously searching for new sources of competitive advantage, and pursuing multiple goals simultaneously. These factors align with the characteristics of a successful digital business strategy (Leonard & Tyers, 2021; Ohlert et al., 2022), such as identifying existing products and services, deconstructing the business model, and discovering new configurations (Remane et al., 2017). In addition, innovation, leadership, and management skills are also essential factors for running a successful digital business (Sousa & Rocha, 2019), which require a digital transformation strategy.

A digital transformation strategy is a crucial guide for companies to govern the transition from a traditional to a digital business model and to ensure successful operation after the transformation (Matt et al., 2015). Digital technologies bring about changes to a company's business model, resulting in product, strategy, and operational transitions (Hess et al., 2016). To implement a digital transformation, Al-debei, El-Haddadeh, and Avison (2008) emphasized the importance of a digital business model, which includes all the requirements of a traditional business model and digital investigations. Moreover, some scholars regard digital transformation as a novel approach to offer all services, including sales and communication channels, in digital format to consumers (Horlach et al., 2017).

Upon reviewing the literature, we found that Nwaiwu's (2018) study provides a comprehensive overview of the theoretical framework for a digital business transformation. The study identified 10 business and academic conceptual bases, which are summarized in the following table.

### **Table 1 – Comparison of conceptual and theoretical frameworks of a digital business transformation**

Although Table 1 offers an overview of common digital business transformation theories, none of these theories provides a comprehensive classification of such transformations, particularly during unexpected crises. Existing literature has put forth propositions for the pandemic and post-pandemic era regarding the transformation of information system strategy by focusing on six key elements: plan, position, perspective, project, preparedness, and platform (Dwivedi et al., 2020). However, there is a gap in digital business studies where researchers and business owners can apply these initiatives to a digital transformation in the business area. This paper aims to address this gap by identifying pragmatic factors for SMEs and large firms to focus on similar segments and successfully implement a digital business transformation.

The following paragraphs will explore the application of the conceptual and theoretical frameworks presented in Table 1 to the context of digital business transformation in both SMEs and large firms. This will examine how these frameworks provide guidance and offer insights into the key factors and elements that organizations should consider during their transformation journey.

- **Business Model:** identifying new revenue streams, leveraging digital technologies, and exploring innovative ways to deliver value to customers.
- **Organization Structure:** adopting flatter hierarchies, cross-functional teams, and agile project management approaches.
- **Human Resources:** training employees on new technologies, fostering a digital mindset, and attracting and retaining digital talent.
- **Internal Processes:** implementing digital tools and technologies to automate workflows, enhance data analytics capabilities, and enable seamless communication and collaboration.
- **IT Capabilities:** evaluating existing systems, adopting cloud-based solutions, and implementing robust cybersecurity measures.
- **Products/Services:** developing new digital products or services, incorporating digital elements into existing offerings, or exploring partnerships with digital solution providers.
- **Stakeholder Engagement:** leveraging digital platforms and technologies to enhance communication, gather feedback, and facilitate meaningful interactions.
- **Offerings and Channels:** leveraging digital channels for marketing, sales, and distribution, and developing innovative and personalized customer experiences.
- **Customers, Partners, and Workforce:** fostering a culture of collaboration, co-creation, and continuous learning to drive innovation and adaptability.
- **Structures, Incentives, and Culture:** creating cross-functional teams, incentivizing digital initiatives, and fostering a learning-oriented and adaptable organizational culture.
- **New Expertise:** acquiring digital skills, fostering an ecosystem mindset, and leveraging external expertise through partnerships and collaborations.
- **New Focus:** adopting new revenue models, targeting digital customer segments, and leveraging data-driven insights for decision-making.
- **New Ways to Work:** leveraging digital technologies for supply chain optimization, real-time data analytics, and responsive customer service.

- Environment: staying informed about digital disruptions and opportunities that may impact the organization's digital transformation journey.

Furthermore, a recent study by Nadkarni and Prügl (2021) provides a comprehensive taxonomy of digital business transformation factors and categorizes them into two major groups: technology and actor. Under technology, the factors include pace of change and time to market, technology capability and integration, consumer and stakeholder interface, distributed value creation and capture, and market environment and rules of competition. Meanwhile, under actor, the factors include transformative leadership, managerial and organizational capabilities, company culture, and work environment. This taxonomy provides a useful framework for understanding and addressing the challenges of digital business transformation, particularly during times of crisis.

These factors consider all types of digital transformation, not just those related to the pandemic or unexpected crises. The study stands out for its thoroughness, as the researchers conducted a comprehensive literature review to identify the main factors of digital transformation. They classified these factors into two major groups, Technology and Actor, and provided detailed definitions and sub-factors for each. This taxonomy offers a valuable resource for other scholars to identify and apply relevant factors to their own research.

## **Methods**

This study utilized secondary data from a case study conducted by TechImpact (2020) to measure the performance of SMEs and large firms in New Brunswick, Canada. The survey included quantitative and qualitative questions and focused on four main sections: demographic, immediate impact, business outlook, and policy support. While the primary data source for this study is the TechImpact survey, the analysis and interpretation of the data extend beyond a mere reporting exercise. This paper has applied a thematic analysis approach to identify patterns, themes, and trends within the data, allowing them to draw meaningful insights and contribute to the ongoing discussions on digital business transformation adoption. Through this analysis, the authors have identified key factors and challenges that influence the successful adoption of digital business transformation in SMEs and large firms. Furthermore, these findings have been linked to existing conceptual and theoretical frameworks, providing a synthesis of the literature and contributing to the theoretical understanding of digital business transformation adoption.

Moreover, by applying these frameworks to the specific context of New Brunswick, Canada, this paper has been able to contextualize and validate their relevance within a real-world setting. The insights gained from this study have practical implications for organizations in New Brunswick and can inform decision-making processes related to digital business transformation initiatives. This contributes to bridging the gap between theory and practice by providing actionable insights that can guide organizations in their digital transformation journeys.

In early 2020, the survey was conducted among 43 businesses in the province of New Brunswick, Canada. The target population of the survey included both SMEs and large firms in

the province. The target population of the survey was businesses that were impacted by the COVID-19 pandemic. The method used to collect the data was an online survey. The survey instrument consisted of both closed and open-ended questions, which were designed to capture the challenges, opportunities, and strategies associated with the pandemic and a possible digital transformation solution.

While alternative sample sizes, such as 40 or 50 organizations, could have been chosen, our focus was on depth rather than breadth. The principle of information saturation was considered when determining the sample size. Saturation refers to the point at which new data or information no longer provides additional insights or contributes substantially to the research objectives (Hennink & Kaiser, 2022). Given the richness of the available data and the comprehensive nature of our analysis, the authors deemed a sample size of 43 organizations sufficient to achieve theoretical saturation and gain a comprehensive understanding of the digital business transformation processes in the context of New Brunswick.

The limitations of this study include the small sample size, the limited scope of the survey questions, and the use of secondary data. The use of secondary data limits the ability to control the quality of data collection and may lead to biases or errors. However, the strengths of the case study method and the uniqueness of the New Brunswick context provide valuable insights into successful digital business transformation during the pandemic.

## **Results and Discussion**

A total of 43 businesses participated in this study, with all but one having a physical presence in New Brunswick. The businesses were classified based on employee count, with 19% having more than 250 employees, 14% having between 50 and 249 employees, 37% having between 10 and 49 employees, and 30% having 1 to 9 employees. The company size definitions used in this study were based on TechImpact's definition of SMEs as companies with under 50 employees and large firms as companies with 50+ employees. The sample consisted of 29 SMEs, accounting for 67% of the total sample, with a focus on local customers in New Brunswick and Atlantic Canada. Of the participating businesses, 16 were start-ups in growth, 14 were mature and privately owned enterprises, 7 were public corporations, 3 were pre-revenue start-ups, and 3 were not-for-profit organizations.

The most significant challenges and impacts of COVID-19 were identified by both large companies and SMEs. Large companies reported a decrease in business due to a lack of customers, staff required to work from home, and impacts on sales/cash flow such as cancelled contracts and slowed decision making on new contracts. In contrast, SMEs faced challenges with staff required to work from home, decreased staff compensation, and impacts on sales/cash flow such as cancelled contracts and slowed decision making on new contracts. Notably, SMEs did not encounter the same issue of decreased business due to a lack of customers, which is a major challenge for larger firms. This highlights the importance of consumer and stakeholder interface in the digital business transformation, which requires large companies to consider customer acquisition and retention, in addition to other challenges, during the pandemic. As noted by

Mithas, Agarwal, and Courtney (2012), digital business strategy should include key components such as e-CRM and e-loyalty. SMEs were able to address these components by prioritizing multiple goals simultaneously and focusing on a new game plan.

The pandemic had significant impacts beyond those previously discussed. Almost 25% of participants reported salary cuts, with the majority being SMEs. Delays, shortages, and other logistical issues were also reported, particularly among larger firms with more complex supply chains. Almost 5% of respondents had to temporarily shut down or liquidate their businesses. However, nearly 40% of participants reported positive impacts, such as the need for new staff or an increase in staff hours. These findings highlight the importance of innovation, leadership, and management skills in the digital business transformation recommended by Sousa and Rocha (2019). In addition, sales and communication channels (Horlach et al., 2017) are key factors in the survey results. They are a novel method of providing digital services to consumers. During the pandemic, both SMEs and large firms in New Brunswick addressed these issues.

In addition, the survey results revealed that SMEs and large firms did not significantly differ in their initial response to the pandemic in terms of their ability to cope with COVID-19. This is indicated by their responses to a Likert Scale question, which are presented in table 2.

#### **Table 2 – Businesses' concern about their ability to deal with COVID-19**

The findings can be attributed to the competencies and crisis management skills of both SMEs and large firms, as well as their familiarity with their organization's limitations, preparedness to tackle unexpected crises, and the intricacy of their internal procedures in adapting to new circumstances. These results underscore the significance and complexity of the six phases of transformation that organizations go through during unexpected challenges, which include initiation, ideation, assessment, engagement, implementation, and sustainability (Ismail et al., 2017). It is common for managers and leaders to struggle with the lack of knowledge and design thinking needed for digital sustainability (Pan & Zhang, 2020).

The survey results revealed that cash flow/cost control, customer engagement, and sales & exports were the top three immediate areas of focus for SMEs, while large firms prioritized cash flow/cost control, workforce protection, and customer engagement. Interestingly, workforce protection ranked higher for large firms than for SMEs, indicating that larger companies invested more resources in protecting their workforce during the pandemic. In contrast, SMEs prioritized leadership/management alignment as the top area of focus, with workforce protection ranking fifth. These findings underscore the importance of company culture and work environment, which are crucial factors in successful digital business transformation, as highlighted by Nadkarni and Prügl (2021).

Additionally, the survey results showed that 34% of SMEs and 57% of large firms anticipated negative long-term implications due to the pandemic. The main concerns listed by SMEs were the deferral or cancellation of projects, permanent loss of revenue from clients in the worst-hit

sectors, delays in raising capital, changing consumer trends necessitating a shift in business models, challenges with customer support and engagement under social distancing constraints, and a high degree of uncertainty. On the other hand, large firms listed their concerns as widespread economic contraction, stalling growth, solvency of long-term clients in the worst-hit sectors, rehiring laid-off staff and developing new human capital, investment needed to expand remote work capacity during reduced sales, reorganization, and structural changes in response to the COVID-19 crisis. These results highlight the importance of adaptability and resilience in the face of unexpected challenges, as well as the need for strategic planning and risk management (Matt et al., 2015). It also emphasizes the significance of a digital business transformation that is flexible enough to adapt to rapidly changing circumstances and respond to new market trends (Mithas et al., 2013). These concerns emphasize the importance of two main cohorts of factors of the digital business transformation, namely internal contexts and external contexts suggested by Ismail, Khater and Zaki (2017).

The fourth section of the survey, Policy Support, is significant for the main objective of this paper. Participants were asked to rate the importance of new emerging policies using a Likert Scale question. The most helpful policy for SMEs was wage subsidies to keep employees and a small, direct cash grant, with 34% of participants selecting this option. For large firms, the most helpful policy was wage subsidies to keep employees, selected by 50% of participants. On the other hand, the least helpful policies for SMEs and large firms were defer tax payments and a small, direct cash grant, respectively, both selected by 34% and 50% of participants. The survey also revealed that 86% of SMEs and 57% of large firms took advantage of the policy programs announced by federal and provincial governments. Other instrumental policy supports reported by the participants included:

- Incentivizing industries to invest in digitization and digital initiatives to stimulate demand for the tech industry.
- Helping high-growth companies pivot or change their business models to deal with the post-COVID 'new normal.'
- Tax credits to incentivize firms to invest in Canadian-made technology.
- Expansion of funding programs for innovation capacity to promote innovation during the downturn.

These policies directly address the role of leadership in the digital business transformation process (Larjovuori, Bordi and Heikkilä-Tammi, 2018) and the key areas that support their decisions and strategies suggested by UNIDO (2020). They assist SMEs and large firms in concentrating on technology initiatives, introducing innovative ideas and solutions, and trying new selling channels to better target new customers and retain existing ones.

Our findings have not only confirmed the importance of the main factors of a digital business transformation suggested in the literature but have also revealed some additional important elements for a successful digital transformation. SMEs demonstrated better management of their staff, were more adaptable to salary cuts, and also hired new employees more readily than large firms. This may be attributed to their attention to the millennial workforce and their familiarity with technology. For instance, as of May 2021, New Brunswick is one of only three provinces with youth employment above pre-COVID-19 levels, with employment levels among 15- to 24-

year-olds in the province being respectively 5% higher than before the pandemic (McCormack, 2021; Statistics Canada, 2021). Most of these new labour forces were employed by SMEs.

This paper also confirmed the significance of the external resources and policy support as key factors for the success of both SMEs and large firms in the province. Wage subsidies were highly beneficial for both SMEs and large firms, while a small direct cash grant was another helpful policy for SMEs. Overall, these policies were more useful for SMEs than larger firms. It was also found that SMEs were more agile in adopting a new digital business model, as suggested by Al-debei, El-Haddadeh and Avison (2008). Making fundamental changes and shifts in the companies' business model is not always an easy process for larger firms, whereas SMEs can more easily adapt to such transformations. This highlights the importance of leaders' roles in changing the organizational culture, focusing on a new business model (Larjovuori et al., 2018; Weill & Woerner, 2018), and conducting this complex shift. The ways in which SMEs and large firms approached the internal and external contexts (Ismail et al., 2017) of their business were also different. Shifting to new online selling channels, CRMs, and SCMs was significantly easier for SMEs than larger firms due to the simplicity, clarity, and directness of their internal and external processes.

Our study confirmed key factors of a successful digital business transformation, as well as identified some new ones. These findings can be useful for decision-makers in other regions who are seeking to develop a digital business strategy to help businesses cope with challenges at the local, national, and international levels. Based on our research, we propose the following suggestions for a digital business transformation:

For SMEs:

- Develop a digital business model
- Appoint a knowledgeable and trained leader
- Focus on low-budget investment in social media and e-marketing
- Hire young experts familiar with digitalization
- Seek out digital partners
- Consider government grants and subsidies
- Establish new sales and communication channels with existing and potential customers

For large firms:

- Embrace innovation, disruptive technologies, and technology promotion
- Avoid digital exclusion and provide technology to different target groups
- Offer mass customization using online channels and e-communications
- Pursue multiple goals simultaneously
- Provide remote working incentives to employees
- Focus on sustaining digital business solutions
- Establish or use a comprehensive content management system (CMS) to manage all key activities (e.g., marketing, accounting, finance, orders and delivery) in one place
- Pay special attention to e-CRM and e-loyalty

The findings of the study shed light on the relative importance of the identified factors and provide insights into the extent to which digital transformation influences firm performance. The analysis reveals that the development of a digital business model is a critical factor for both SMEs and large firms, highlighting the significance of having a well-defined digital strategy aligned with the organization's goals and objectives. Additionally, appointing a knowledgeable and trained leader emerges as another key factor, emphasizing the importance of leadership in guiding and driving digital initiatives within an organization.

Moreover, the study highlights the importance of investment in social media and e-marketing for SMEs, showcasing how these digital channels can be leveraged effectively even with limited budgets to reach and engage with the target audience. Similarly, large firms can benefit from embracing innovation, disruptive technologies, and technology promotion, which underscores the need for continuous investment in cutting-edge technologies and innovative approaches to leverage technology for business growth and improvement.

Furthermore, the findings demonstrate the positive impact of establishing new sales and communication channels with existing and potential customers for SMEs. By expanding their reach and enhancing customer engagement through digital channels, SMEs can increase their competitiveness and create new business opportunities. For large firms, the study emphasizes the importance of sustaining digital business solutions, highlighting the need to continuously evaluate and optimize digital processes and solutions to ensure long-term success and maintain a competitive edge in the digital landscape.

It is worth noting that while theories such as TOE, TAM, and UTAUT have been widely applied in the context of technology adoption and digital transformation, they predominantly focus on the role of technology in driving organizational change. These theories often emphasize factors such as perceived usefulness, ease of use, organizational readiness, and external pressures.

In this study, the authors aimed to take a broader perspective by exploring a wider range of factors beyond technology adoption alone. They sought to identify the key drivers and considerations that contribute to the overall performance of SMEs and large firms in the specific context of New Brunswick, Canada. By considering factors such as leadership and management alignment, customer engagement approaches, organizational capabilities, business models, workforce engagement, and policy support, this paper aimed to provide a more comprehensive understanding of the factors that influence the success of digital business transformation initiatives.

This approach recognized that digital business transformation encompasses not only the adoption of technology but also organizational and strategic considerations. By considering a diverse set of factors, this study shed light on the multifaceted nature of digital transformation and provide insights that go beyond the traditional technology-centric perspectives.

Through this study, the authors contribute to the ongoing discussions on digital business transformation adoption by highlighting the importance of a holistic and multifaceted approach. By examining a wide range of factors and their impact on the performance of SMEs and large firms in New Brunswick, this study provides valuable insights into the complexities and nuances

of digital transformation initiatives, offering a more comprehensive theoretical foundation for future research and practice in this area.

### Theoretical and Practical Contributions

The findings of this study contribute to both theoretical and practical understandings of digital business transformation in the context of SMEs and large firms. The confirmation of the main factors identified in the literature validates the existing theoretical frameworks and provides further support for their relevance in driving successful digital adaptation. Additionally, this study uncovers some additional important elements of a successful digital transformation that were specific to the case of New Brunswick, Canada. These findings enhance the theoretical understanding by expanding the scope of factors that should be considered in digital transformation initiatives. Practically, the study offers valuable insights and recommendations for SMEs and large firms looking to embark on a digital business transformation journey. The specific suggestions provided for each group highlight the unique challenges and opportunities they face and provide practical guidance for addressing them. For SMEs, the recommendations emphasize the importance of creating a digital business model, investing in low-budget social media and e-marketing, recruiting young digital experts, and accessing government grants and subsidies. On the other hand, the recommendations for large firms emphasize innovation, mass customization through online channels, remote work incentives, comprehensive content management systems, and prioritizing e-CRM and e-loyalty.

### Direction for Future Research

There are several avenues for future research that can further contribute to the understanding of digital business transformation and its implications. Future research could focus on examining the applicability of the suggested list of factors and recommendations to other provinces in Canada. Investigating the transferability and effectiveness of these practical points across different regions in Canada would enhance our understanding of digital business transformation strategies in diverse settings. Furthermore, extending the scope of research beyond the Canadian context, future studies can explore the relevance and applicability of the identified factors and recommendations to international regions with similar characteristics. Another promising avenue for future research is to delve deeper into the specific challenges and opportunities faced by different industries during the digital business transformation process. This study primarily focused on SMEs and large firms in New Brunswick, but various sectors may have unique characteristics and requirements when it comes to digital adaptation. Investigating the industry-specific factors and strategies for successful digital transformation would provide targeted insights for businesses operating in different sectors. Additionally, future research can explore the long-term impacts and sustainability of the digital business transformation initiatives undertaken during the pandemic.

## Conclusion

The COVID-19 pandemic has had a significant impact on businesses worldwide, forcing them to adapt and change their strategies to survive. One of the most significant changes that businesses have had to make is the shift from traditional offline operations to an online presence. This has been true for a wide range of businesses, including those in the food industry and the arts and crafts sector. However, there has been a common assumption that SMEs lack the capacity and expertise to make this shift during unexpected crises, while large firms can cope with new conditions more easily.

However, the case of New Brunswick's businesses proves that this assumption is not accurate. Statistics reveal that both SMEs and large firms have responded to the pandemic in different ways and have focused on various factors to achieve successful digital business transformation. This study identified critical success factors for digital transformation based on existing literature, such as the role of leaders and digital partners, as well as the importance of considering new sales and communication channels with customers. In addition, this study recognized new factors for success that were tested and implemented by SMEs and large firms in New Brunswick.

For SMEs, these factors included the creation of a digital business model, focusing on low-budget investments in social media and e-marketing, hiring young experts familiar with digitalization, and considering government grants and subsidies. For large firms, the factors for success included offering mass customization using online channels and e-communications, providing remote working incentives to their employees, creating or occupying a comprehensive CMS to manage all key activities in one place, and paying special attention to e-CRM and e-loyalty.

In conclusion, this study shows that successful digital business transformation during a crisis is achievable for both SMEs and large firms. By focusing on key success factors identified by this study, businesses can adapt to the rapidly changing business landscape and ensure their survival in the long run. These findings are not limited to New Brunswick but can also be expanded to other regions with similar characteristics worldwide.

## References

- Al-debei, M. M., El-Haddadeh, R., & Avison, D. (2008). Defining the Business Model in the New World of Digital Business. *Fourteenth Americas Conference on Information Systems*, 1–11.
- Alghatrifi, I., & Khalid, H. (2019). A Systematic Review of UTAUT and UTAUT2 as a Baseline Framework of Information System Research in Adopting New Technology: A case study of IPV6 Adoption. *2019 6th International Conference on Research and Innovation in Information Systems (ICRIIS)*, 1–6.

- Alshamsi, A., Mohaidat, J., Hinai, N. Al, & Samy, A. (2020). Instructional and Business Continuity Amid and Beyond COVID-19 Outbreak: A Case Study from the Higher Colleges of Technology. *International Journal of Higher Education*, 9(6), 118–135.
- Amankwah-amoah, J., Khan, Z., Wood, G., & Knight, G. (2021). COVID-19 and Digitalization: The great Acceleration. *Journal of Business Research*, 136(April), 602–611.
- Barnes, S. J. (2020). Information Management Research and Practice in the Post-COVID-19 World. *International Journal of Information Management*, 55(June), 1–4.
- Doyle, R., & Conboy, K. (2020). The Role of IS in the Covid-19 Pandemic: A Liquid-modern Perspective. *International Journal of Information Management*, 55(July), 1–10.
- Dragan, I. (2021). Digital Transformation During Lockdown. *Informatica Economica*, 25(1), 86–94.
- Dwivedi, Y. K., Hughes, D. L., Coombs, C., Constantiou, I., Duan, Y., Edwards, J. S., Gupta, B., Lal, B., Misra, S., Prashant, P., Raman, R., Rana, N. P., Sharma, S. K., & Upadhyay, N. (2020). Impact of COVID-19 Pandemic on Information Management Research and Practice: Transforming Education, Work and Life. *International Journal of Information Management*, 55(July), 1–20.
- Fletcher, G., & Griffiths, M. (2020). Digital Transformation During a Lockdown. *International Journal of Information Management*, 55(July), 1–3.
- Hess, T., Matt, C., & Benlian, A. (2016). *Options for Formulating a Digital Transformation Strategy*. June.
- Hogue, R. (2021). *Provincial Economies Reaching the Other Side of the Valley*. Royal Bank Economists.
- Horlach, B., Drews, P., & Schirmer, I. (2017). Increasing the Agility of IT Delivery: Five Types of Bimodal IT Organization. *The 50th Hawaii International Conference on System Sciences*, 5420–5429.
- Iivari, N., Sharma, S., & Ventä-olkkonen, L. (2020). Digital Transformation of Everyday Life – How COVID-19 Pandemic Transformed the Basic Education of the Young Generation and Why Information Management Research should Care ? *International Journal of Information Management*, 55(June), 1–6.
- Ismail, M. H., Khater, M., & Zaki, M. (2017). Digital Business Transformation and Strategy: What Do We Know So Far ? In *Cambridge Service Alliance* (Issue November).
- Jones, R. (2021). *N.B. Spent Far Less than Other Provinces on COVID Recovery, but Economy is Booming Anyway*. CBC News. <https://www.cbc.ca/news/canada/new-brunswick/new-brunswick-economy-1.6065659>
- Klein, V. B. (2021). COVID-19 Crisis and SMEs Responses: The Role of Digital Transformation. *Knowledge and Process Management*, December, 117–133.
- Larjovuori, R.-L., Bordi, L., & Heikkilä-Tammi, K. (2018). Leadership in the Digital Business Transformation. *The 22nd International Academic Mindtrek Conference*, 212–221.

- Li, S. (2021). How Does COVID-19 Speed the Digital Transformation of Business Processes and Customer Experiences? *Review of Business*, 41(1), 1–14.
- Matt, C., Hess, T., & Benlian, A. (2015). Digital Transformation Strategies. *Business & Information Systems Engineering*, 57(5), 339–343.
- McCormack, C. (2021). *Differences in the Economic Impacts of COVID-19 across the Provinces and Territories*. Statistics Canada.
- Mithas, S., Agarwal, R., & Courtney, H. (2012). Digital Business Strategies and the duality of IT. *IT Professional*, 14(October), 2–4.
- Mithas, S., Tafti, A., & Mitchell, W. (2013). How a Firm's Competitive Environment and Digital Strategic Posture Influence Digital Business Strategy. *MIS Quarterly: Management Information Systems*, 37(2), 511–536.
- Nadkarni, S., & Prügl, R. (2021). Digital Transformation: A Review, Synthesis and Opportunities for Future Research. *Management Review Quarterly*, 71(2), 233–341.
- Nwaiwu, F. (2018). Review and Comparison of Conceptual Frameworks on Digital Business Transformation. *Journal of Competitiveness*, 10(3), 86–100.
- Pan, S. L., & Zhang, S. (2020). From Fighting COVID-19 Pandemic to Tackling Sustainable Development Goals: An Opportunity for Responsible Information Systems Research. *International Journal of Information Management*, 55(July), 1–6.
- Remane, G., Hanelt, A., Nickerson, R. C., & Kolbe, L. M. (2017). Discovering Digital Business Models in Traditional Industries. *Business Strategy*, 38(2), 41–51.
- Robles-Gomez, A., Tobarra, L., Pastor-Vargas, R., Hernandez, R., & Haut, J. M. (2021). Analyzing the Users' Acceptance of an IoT Cloud Platform Using the UTAUT/TAM Model. *IEEE Access*, 9, 150004–150020.
- Singeh, F. W., Abrizah, A., & Kiran, K. (2020). Bringing the Digital Library Success Factors into the Realm of the Technology-organization-environment Framework. *The Electronic Library*, 38(3), 659–675.
- Sousa, M. J., & Rocha, Á. (2019). Skills for Disruptive Digital Business. *Journal of Business Research*, 94, 257–263.
- Stankiewicz, E. (2021). Covid-19 Uncertainty and Managerial Readiness for Digital Transformation in Context of Transgressive Innovation. *ISPIM Innovation Conference – Innovating Our Common Future*, June, 1–31.
- Statistics Canada. (2021). *Economic Impacts of COVID-19 in the Provinces and Territories*. Statistics Canada.
- TechImpact. (2020). Tech Community COVID 19 Impact Survey. In *TechImpact*.

- UNIDO (United Nations Industrial Development Organization). (2020). COVID-19 - Implications & Responses - Digital Transformation & Industrial Recovery. In *UNIDO*.  
[https://www.google.com/url?sa=t&source=web&rct=j&url=https://www.unido.org/sites/default/files/files/2020-07/UNIDO\\_COVID\\_Digital\\_Transformation\\_0.pdf&ved=2ahUKEwiSv7DtqrjyAhUoxYUKHc0yDoUQFnoECA0QAQ&usg=AOvVaw1aTfbEw4exM104TWOjxICN](https://www.google.com/url?sa=t&source=web&rct=j&url=https://www.unido.org/sites/default/files/files/2020-07/UNIDO_COVID_Digital_Transformation_0.pdf&ved=2ahUKEwiSv7DtqrjyAhUoxYUKHc0yDoUQFnoECA0QAQ&usg=AOvVaw1aTfbEw4exM104TWOjxICN)
- Vrontis, D., Chaudhuri, R., & Chatterjee, S. (2022). Adoption of Digital Technologies by SMEs for Sustainability and Value Creation: Moderating Role of Entrepreneurial Orientation. In *Sustainability* (Vol. 14, Issue 13).
- Wade, M., & Shan, J. (2020). Covid-19 Has Accelerated Digital Transformation, but May Have Made it Harder Not Easier. *MIS Quarterly: Management Information Systems*, 19(3), 213–220.
- Weill, P., & Woerner, S. L. (2018). What's Your Digital Business Model? In *Harvard Business Review*.