



Please cite this article as:

Mohd Asri, S. N., Karim, N. N. B., & Abdullah, A. M. (2022). Siti Nuraina Mohd Asri Digital Transformation as A Catalyst for Sme Business Model Innovation. The Asian Journal of Professional & Business Studies, 3(1), 49–61. <https://doi.org/10.61688/ajpbs.v3i1.361>

## DIGITAL TRANSFORMATION AS A CATALYST FOR SME BUSINESS MODEL INNOVATION

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Received 1 April 2022, Accepted 25 May 2022, Available online 30 June 2022

### ABSTRACT

[ This study explores the transformative impact of digital technologies on the business models of Small and Medium-sized Enterprises (SMEs) in Malaysia. It investigates how digital transformation enhances operational efficiency, market expansion, and customer engagement while addressing key challenges, including limited resources, digital literacy gaps, and resistance to change. Utilizing a qualitative research approach, in-depth interviews with SME owners and managers across various industries revealed critical strategies for digital adoption. Key findings include phased implementation, gradual integration of digital tools, and targeted staff training as pivotal to achieving successful outcomes. Digital transformation was found to significantly broaden customer reach, foster innovation, and enhance business resilience. Additionally, the study highlights the role of supportive ecosystems, including government policies, digital infrastructure, and training programs, in facilitating SMEs' transition into the digital economy. By addressing these structural and operational gaps, the research provides practical recommendations for SMEs and policymakers to promote sustainable growth, innovation, and global competitiveness. This study emphasizes the need for a strategic and inclusive approach to digital transformation, ensuring SMEs are well-equipped to thrive in an increasingly digitalized and dynamic market landscape.]

*Keywords:* Digital Transformation, SME's, Business Model, Innovation, Technology Adoption

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## 1.0 INTRODUCTION

[ Digital transformation has become a crucial factor in redefining business models, especially in small and medium-sized organisations (SMEs). This topic is significant because to its capacity to augment operational efficiency, stimulate innovation, and elevate competitiveness in a progressively digital economy. Given that SMEs constitute a significant segment of the global economy, their adaptation to digital transformation is essential for both their survival and the overall economic growth and societal welfare. Many SMEs encounter obstacles during this shift, such as constrained resources, insufficient digital competencies, and unwillingness to change, which impede their capacity to utilise digital technology successfully (Gu, 2022). A significant deficiency in the literature is the inadequate comprehension of the particular obstacles that SMEs face during digital transformation, especially in varied economic circumstances, warranting additional research (Omelyanenko & Omelianenko, 2022).

The importance of e-commerce initiatives has grown more evident inside Malaysian SMEs. The digital transformation of business models via e-commerce not only improves market access but also augments consumer engagement and operational efficiencies (Alzahrani, 2018). This change is essential for Malaysia's socio-economic growth, since it enables SMEs to compete globally and fosters job creation and innovation (Ibrahim et al., 2018). Nevertheless, the clear advantages, a study void persists about the distinct obstacles encountered by Malaysian SMEs in the use of e-commerce, especially related technological infrastructure and digital literacy (Ayob, 2021).

Digital transformation significantly impacts business models in SMEs, requiring an overhaul of conventional operational structures. The use of digital technologies allows SMEs to optimise processes, improve customer experiences, and generate additional revenue (Bodrov et al., 2019). This transition is especially important in the present environment, where enterprises must swiftly adjust to evolving consumer behaviours and market dynamics, intensified by occurrences such as the COVID-19 pandemic (Shahzad et al., 2020). The necessity for agility and responsiveness in corporate operations highlights the significance of digital transformation as a strategic imperative for SMEs.

Digital transformation in SMEs involves more than just technology adoption, it signifies a comprehensive shift in business strategy and culture. By adopting digital tools and platforms, SMEs can establish a culture of innovation and ongoing enhancement, which is important for enduring sustainability (Khan et al., 2021). Moreover, digital transformation promotes collaboration and knowledge exchange among SMEs, hence augmenting their combined competitiveness in the market.

Numerous aspects affect the digital transformation of business models in SMEs, such as organisational culture, leadership dedication, and technological access (Nair et al., 2019). The degree of influence differs, with organisational culture frequently serving as a crucial factor in the effective implementation of digital strategies by SMEs. Moreover, external elements like market demand and regulatory backing significantly influence the digital environment for SMEs, underscoring the necessity for a conducive ecosystem to promote digital adoption (Kartiwi et al., 2018).

Prior research has examined multiple aspects of digital transformation in SMEs, uncovering factors that facilitate and hinder e-commerce adoption (Isa & Alenezi, 2022). Nonetheless, there is a necessity for more extensive study that examines the contextual elements affecting digital transformation across many countries and sectors. This encompasses comprehending the interaction among technology, organisational competencies, and market dynamics, which is inadequately examined in current literature.

The article aims to examine the effects of digital transformation on business models in SMEs, specifically highlighting the obstacles and possibilities that emerge throughout this process. This research seeks to offer practical insights for SMEs aiming to manage the intricacies of digital transformation, thereby enhancing their resilience and growth within the digital economy. This research has significant implications for policymakers and industry stakeholders, highlighting the necessity of cultivating an environment that promotes digital innovation and entrepreneurship (Costa & Castro, 2021). ]

## 2.0 LITERATURE REVIEW

### 2.1 Digital Transformation

The historical progression of research about digital transformation in small and medium-sized organisations (SMEs) has advanced markedly during the last twenty years. The initial emphasis was predominantly on the integration of information technology (IT) and its effect on operational efficiency. As digital technology progressed, academics started to investigate the wider ramifications of digital transformation on business models, especially in small and medium-sized enterprises (SMEs). Digital transformation alters the operational and customer interaction methods of SMEs in Malaysia, prompting modifications in their business operations and value delivery mechanisms. Significant milestones encompass the acknowledgement of digital transformation as a strategic necessity for SMEs to sustain competitiveness in a swiftly evolving market landscape (Teng et al., 2022). Recent theoretical frameworks have arisen, highlighting the interaction between digital technology and organisational capacities, including dynamic capabilities and entrepreneurial orientation (Martins, 2022). Studies have progressively utilised mixed techniques and longitudinal designs to elucidate the intricacies of digital transformation processes and their effects on performance (Priyono et al., 2020).

Moreover, scholars have proposed various definitions of digital transformation in the context of SMEs, emphasising different aspects of the notion. Some definitions highlight the incorporation of digital technology throughout all business sectors, substantially transforming value creation and delivery (Martinelli et al., 2020). Others emphasise the strategic renewal and adaptability necessary for SMEs to prosper in a digital economy. An analysis of these criteria uncovers recurring themes, including the imperative for SMEs to adopt digital technology to augment customer engagement, enhance operational efficiency, and stimulate innovation (Ziółkowska, 2021). Digital transformation is characterised by a comprehensive strategy that includes technological, organisational, and strategic components, highlighting its multiple nature in the context of SMEs.

Furthermore, recent advances in the examination of digital transformation in SMEs have revealed new constructions and theoretical models aimed at elucidating the dynamics of this change. The notion of dynamic capacities has gained prominence, highlighting the capacity of SMEs to recognise, seize, and transform in reaction to digital possibilities (Martins, 2022). Furthermore, frameworks emphasising the significance of digital entrepreneurial strategies have been established to demonstrate how SMEs can utilise digitalisation for expansion and resilience. These developments indicate a transition towards perceiving digital transformation as an ongoing activity necessitating continual adaptation and strategic alignment with market demands.

Therefore, numerous aspects influence the digital transformation of business models in SMEs, such as organisational culture, leadership dedication, and availability of digital technologies (Garzoni et al., 2020). The role of these elements differs; for example, a supportive organisational culture is frequently regarded as essential for promoting innovation and enabling the adoption of digital practices. The availability of both financial and technological resources substantially impacts the ability of SMEs to effectively undertake their digital transformation journeys (Teng et al., 2022). Comprehending these contributing aspects is crucial for formulating focused solutions to assist SMEs in their transformation endeavours.

However, current trends in research methodologies for examining digital transformation in SMEs reveal an increasing inclination towards quantitative techniques, notably structural equation modelling and survey-based investigations. This trend facilitates the analysis of intricate interactions among factors and offers actual evidence regarding the influence of digital transformation on SME performance. There is a demand for qualitative research that examines the lived experiences of SME owners and managers during the transformation process, potentially offering profound insights into the obstacles and opportunities they encounter (Priyono et al., 2020). These findings indicate that future research ought to employ a mixed-methods approach to fully capture the complexity of the digital transformation experience in SMEs.

The summary of prior research indicates that, although substantial advancements have been achieved in comprehending digital transformation in SMEs, limitations remain. Numerous research has concentrated on particular industries, thereby constraining the generalisability of their conclusions (Lei et al., 2022). Furthermore, whereas several studies emphasise the significance of dynamic skills and strategic alignment, they frequently lack empirical validation of these constructs across various SME contexts. Future study should address the gaps in the literature by examining the interaction between internal and external factors affecting digital transformation across diverse industries and geographical regions, along with the long-term effects of digital transformation on the resilience and growth of SMEs.

## 2.2 Business Model in SMEs

The concept of business models in small and medium-sized firms (SMEs) has been articulated in multiple ways by academics, illustrating the intricacy and fluidity of the domain. A business model is defined as the framework through which an organisation generates, distributes, and retains value (Rachinger et al., 2019). Another viewpoint underscores the significance of the value proposition, defined as the distinctive value a company provides to its clients, as a fundamental component of the business model. A third definition emphasises the function of business models in aligning resources and capabilities to effectively address market demands (Parida et al., 2019). These definitions collectively highlight the complex nature of business models in SMEs, which must adjust to evolving market conditions and technology progress. The correlation between digital transformation and business models in SMEs is substantial, as digitalisation significantly modifies their operational and competitive dynamics. Digital transformation alters the operational and customer interaction methods of SMEs in Malaysia, facilitating innovation in their value propositions and processes. To do this, SMEs can implement digital tools through strategic planning, training, and utilisation of online channels.

The relationship between digital transformation and business models in SMEs is substantial, as digitalisation significantly modifies the operational and competitive dynamics of these firms. Prior studies suggest that digital transformation might facilitate the reconfiguration of business models, allowing SMEs to adapt their value propositions and operational procedures (Rachinger et al., 2019). The incorporation of digital technologies enables SMEs to improve customer engagement, optimise processes, and create new revenue streams. Moreover, research indicates that SMEs that adopt digital transformation are more adept at adapting to market fluctuations and client demands, thereby enhancing their competitive edge.

Hence, regarding the expanding corpus of literature on digital transformation and business models in SMEs, numerous limitations and research gaps persist. A multitude of studies has concentrated on certain industries or geographic areas, thereby constraining the generalisability of their results. Moreover, there frequently exists an absence of empirical evidence substantiating the proposed theoretical frameworks, especially concerning the mechanisms by which digital transformation affects business model innovation (Parida et al., 2019). The interaction between internal and external factors influencing digital transformation in SMEs remains inadequately examined, highlighting the necessity for more thorough study that addresses these dynamics (Tahiri, 2022).

This study aims to address these gaps by offering a detailed understanding of the effects of digital transformation on business models in SMEs. This research utilises a mixed-methods approach to elucidate the intricacies of the transformation process and to pinpoint the precise aspects that promote or obstruct successful business model innovation. The study will examine the contextual elements affecting the interaction between digital transformation and business models, providing significant insights for practitioners and policymakers aiming to assist SMEs in their digital efforts.

## 2.3 Digital Transformation Impacts on The Business Models of SMEs In Malaysia

The development of small and medium companies (SMEs) in Malaysia has been profoundly impacted by digital transformation, especially in the shift from conventional brick-and-mortar operations to e-commerce platforms. Historically, Malaysian SMEs depended significantly on physical retail locations and traditional marketing techniques.

The emergence of digital technology has initiated a paradigm shift towards online business models and digital marketing tactics, allowing SMEs to access wider markets and improve consumer interaction (Foroudi et al., 2017). Notwithstanding these developments, the primary challenges encountered by SMEs encompassed obstacles to technology adoption, including restricted access to digital tools, inadequate digital literacy, and a deficiency in knowledge for navigating the digital landscape (Alam et al., 2022). These constraints have frequently impeded SMEs from fully capitalising on the promise of digital transformation within their business models.

The effects of digital transformation on business models can be evaluated through multiple academic perspectives. Recurring themes noted in the literature encompass increased operational efficiency, augmented client interaction, and novel service delivery. The transformation experience for SMEs significantly differs from that of larger organisations, particularly due to their inherent agility and limited resources. Small and medium-sized enterprises frequently adjust more swiftly to digital transformations; yet, they encounter considerable obstacles in resource distribution and strategic planning, which may restrict their ability to execute extensive digital strategies (Xin et al., 2022). This dichotomy underscores the distinctive role of SMEs in the digital transformation arena, where their agility may serve as both a benefit and a constraint.

Moreover, to evaluate the impact of digital transformation on the business models of SMEs, frameworks like the Business Model Canvas and the Dynamic Capabilities Framework are essential. The Business Model Canvas facilitates a systematic examination of the impact of digital transformation on several elements of a business model, such as cost structures, income streams, and customer interactions (Sinyuk et al., 2021). The Dynamic Capabilities Framework highlights the capacity of SMEs to adjust and reorganise their resources in reaction to evolving market conditions, which is essential for digital transformation (Martins, 2022). These frameworks provide a thorough comprehension of the complex effects of digital transformation, allowing SMEs to effectively manage their development in the digital age.

The effects of digital transformation for Malaysian SMEs are significant. Innovation is a principal result, as numerous SMEs launch digital products and services that enhance their company processes. Efficiency improvements are significant, as SMEs progressively implement automation and cloud-based systems to lower operational expenses and boost service delivery. Moreover, digital engagement via social media and e-commerce platforms has enabled SMEs to access a broader audience, therefore enhancing their market reach. The scalability provided by digital tools allows SMEs to penetrate new markets more efficiently, illustrating the transformative capacity of digital technology in promoting growth and resilience. Local case studies exemplify these trends, highlighting SMEs that have effectively managed digital transformation to attain substantial business results.

Therefore, external factors significantly influence alterations in business models among SMEs. Customer demand for digital services, competitive pressures from domestic and international entities, and swift technology advancements are primary motivators. Moreover, governmental initiatives, including grants and the creation of digital hubs, have been essential in advancing the digital transformation of SMEs in Malaysia (Garzoni et al., 2020). These supportive measures not only offer financial aid but also augment the digital competencies of SMEs, empowering them to compete more successfully in the digital market.

However, recent studies have increasingly concentrated on the impact of digital transformation on SME business models in Malaysia. Common approaches utilised encompass surveys, comparison studies, and case analyses, which yield insights into the varied experiences of SMEs experiencing digital transformation (Teng et al., 2022). There is an increasing focus on sustainable business models and data-driven decision-making as SMEs strive to match their operations with current market demands. This trend indicates a growing acknowledgement of the necessity for SMEs to incorporate sustainability into their digital strategy to improve long-term viability.

Nevertheless, advancements in comprehending the effects of digital change, numerous research gaps persist. The particular transformation trajectories of micro-SMEs are inadequately emphasised, as they frequently encounter problems that differ from those faced by larger SMEs (Xin et al., 2022). Furthermore, the scarcity of longitudinal studies impedes

the comprehension of business model evolution over time, while the insufficient investigation into the societal and environmental ramifications of digital transformation results in considerable unsolved problems (Sinyuk et al., 2021). Subsequent study should focus on addressing these deficiencies by investigating sector-specific effects and adaptive techniques that SMEs may utilise in their digital transformations.

Digital transformation offers several advantages for SMEs, such as heightened resilience, augmented innovation, and better market competitiveness. Policymakers are essential to this shift by executing focused digital training initiatives, enhancing digital infrastructure, and promoting innovation among SMEs (Garzoni et al., 2020). Such measures can enable SMEs to fully leverage digital technologies, hence enhancing the strength and competitiveness of the SME sector in Malaysia.

### **3.0 METHODOLOGY**

This study employed a qualitative research approach using structured questionnaires to explore SME owners' experiences with digital transformation. The questionnaire was developed to capture key themes such as the adoption of digital tools, customer engagement, operational efficiency, and market strategies.

A purposive sampling technique was used to select participants with relevant expertise in managing SMEs and engaging in digital transformation efforts. The study involved five SME owners or co-owners from Malaysia who were actively involved in business decision-making and had first-hand experience with integrating digital technologies. Selection was based on inclusion criteria such as direct managerial roles and hands-on involvement in transformation initiatives.

Data were collected through in-depth, semi-structured interviews. An interview guide with open-ended questions was used to explore various areas including the use of digital tools, operational changes, and challenges faced by the SMEs.

The collected data were transcribed and analyzed using thematic analysis to identify common themes, recurring patterns, and insights related to how digital transformation influenced SME business models. Atlas.ti software was utilized to support the systematic coding and organization of the data.

All participants provided informed consent prior to the interviews. The study ensured confidentiality by anonymizing participants' identities, and all audio recordings and transcripts were securely stored. The research adhered to standard ethical guidelines and received the necessary institutional ethical approval.

## **4.0 FINDINGS AND DISCUSSION**

### **4.1 Data Analysis**

The demographic analysis of the respondents in this study includes five Small and Medium-sized Enterprises (SMEs) owners and managers based primarily in the Klang Valley region of Malaysia. The respondents, aged between 35 and 55, are all Malay Muslims. They represent a variety of industries, including food services (cafe and bakery, roadside food stall, dessert store), retail (clothing boutique), and artisanal goods (handmade soap business). The respondents hold different roles within their businesses, with four serving as owners and two as managers. The businesses are located in key urban areas such as Selangor and Kuala Lumpur, reflecting the concentration of SME activity in these regions. This demographic diversity provides insight into the varied backgrounds and operational roles within Malaysian SMEs.

### **4.2 Descriptive Statistics Analysis**

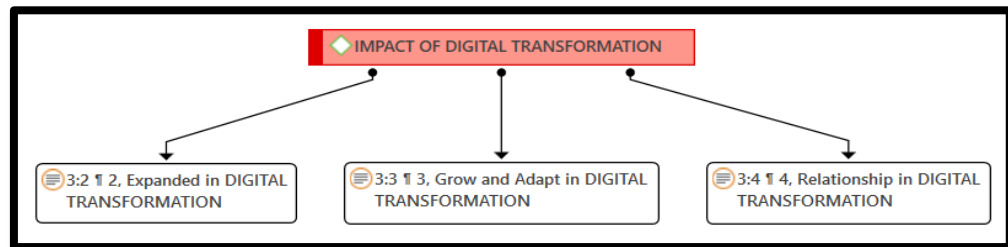
In October 2022, five SMEs owners or managers mainly Klang Valley area were interviewed in this study. The results of the demographic characteristics of respondents are shown in Table 2: Profiles of Respondents

**Table 2: Profiles of Respondents**

RESPONDENT	NAME	AGE	RELIGION	LOCATION	CURRENT SMES BUSINESS	ROLE IN SMES
1	Mr. Adam	40	Malay, Islam	Selangor, Malaysia	Cafe and bakery	Manager
2	Ms. Erene	35	Malay, Islam	Kuala Lumpur, Malaysia	Clothing boutique	Manager
3	Mrs. Nora	45	Malay, Islam	Selangor, Malaysia	Handmade soap business	Owner
4	Mr. Asri	55	Malay, Islam	Taman Melawati, Kuala Lumpur	Roadside food stall	Owner
5	Mrs Rohaya	35	Malay, Islam	Sri Rampai, Kuala Lumpur	Dessert Store	Owner

The findings from the research were subsequently analysed by Atlas.ti software, and the summary of the results is as follows:

### 4.3 Research Findings One: Impact Digital Transformation



**Figure 1. Impact of Digital Transformation using Atlas.Ti Software**

Digital transformation has significantly reshaped the business models of SMEs in Malaysia. It enables businesses to expand their reach, adapt to evolving customer needs, and build stronger brand identities through online platforms. From the interviews, three primary themes emerged, which are Expansion, Growth and Adaptation, and Relationship Building in digital transformation.

#### 4.3.1 Expanded

Expansion in digital transformation refers to how SMEs have broadened their customer reach and diversified their business models by leveraging online platforms. This shift has enabled businesses to serve both local and remote customers, expanding their audience and sales opportunities. From the interviews, two respondents mentioned how digital transformation has expanded their business.

*“So, our business model has shifted from just serving locals to also catering to online orders and delivery, which has expanded our customer base.”—Respondent: Mrs. Rohaya*

*“It’s expanded our audience and sales, but it feels like running two businesses at once.”—Respondent: Mr. Adam.*

### 4.3.2 Grow and Adapt

Growth and adaptation in digital transformation reflect how SMEs evolve by enhancing their online presence and adjusting to digital demands to maintain customer engagement. This transition allows businesses to scale their operations and build resilience, although it may require additional effort to sustain both physical and digital spaces. From the interviews, two respondents shared their experiences on growing and adapting through digital transformation.

*“This shift has allowed us to grow and adapt, but it also means staying active online and keeping our store’s digital presence as appealing as our physical one.”—Respondent: Ms. Erene*

*“While it’s helped us grow, it’s also added more work.”—Respondent: Mrs. Nora.*

### 4.3.3 Relationship

The relationship aspect in digital transformation emphasizes how SMEs use digital tools to connect with customers, even those they may never meet in person. This shift fosters a new form of customer interaction that strengthens connections and builds trust, essential for sustaining long-term loyalty. From the interviews, one respondent highlighted the importance of digital transformation in enhancing customer relationships.

*“Digital transformation makes us small businesses more connected to customers we never even see in person.”—Respondent: Mr. Mohd Asri.*

## 4.4 Research Finding Two: Implementation

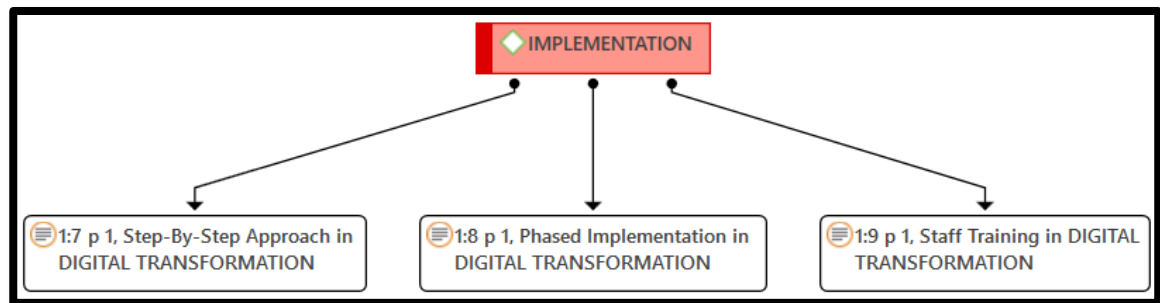


Figure 2. Implementation using Atlas.Ti Software



Implementation in Digital Transformation involves the practical steps taken by SMEs to gradually integrate digital tools in their operations. Three themes emerged in the implementation process: Step-By-Step Approach, Phased Implementation, and Staff Training.

#### **4.4.1 Step-By-Step**

Step-by-Step implementation is a methodical approach where SMEs introduce digital tools progressively. This gradual method allows businesses to adapt to each tool fully before advancing, minimizing risks and ensuring each step aligns with business goals.

*“We took it step by step. First, we joined delivery apps, which were easy to use and brought in more orders.” — Respondent: Mr. Adam*

*“We also focused on training our staff step by step on how to handle online orders and customer questions.” — Respondent: Ms. Erene.*

#### **4.4.2 Phased Implementation**

Phased Implementation in digital transformation refers to gradually integrating digital tools in stages, allowing SMEs to test each tool's effectiveness and adapt smoothly. This method helps manage resources efficiently and ensures that each digital step adds value to the business without overwhelming operations.

*“We started an Instagram page for the cafe to post pictures of our pastries and cakes.” — Respondent: Mr. Adam*

*“We made an Instagram page to show off our clothes, then gradually set up an online store.” — Respondent: Ms. Erene*

*“I got on Instagram and TikTok to showcase my products, which didn't cost anything.” — Respondent: Mrs. Nora*

*“I started with just using Grab and Food panda to get orders. Then I slowly introduced e- wallet payments because more people asked for it.” — Respondent: Mr. Mohd Asri*

*“Accepting e-wallet payments was a small but important step because customers prefer it.” — Respondent: Mrs. Rohaya.*

#### **4.4.3 Staff Training**

Staff Training is the process of preparing employees to effectively use digital platforms, ensuring they feel comfortable with each tool before moving to the next stage. Proper training empowers staff to manage digital tasks confidently, enhancing overall operational efficiency.

*“It was one thing at a time. We made sure the staff was comfortable using the apps and posting on social media before moving on.” — Respondent: Mr. Adam.*

### **5.0 CONCLUSION**

This study has explored the transformative impact of digital technologies on the business models of Small and Medium-sized Enterprises (SMEs) in Malaysia. The key findings reveal that digital transformation significantly enhances operational efficiency, customer engagement, and market reach. Critical enablers of successful digital transformation include phased implementation, step-by-step integration of digital tools, and targeted staff training. These strategies not only help SMEs overcome barriers such as limited resources and digital literacy gaps but also position them to adapt to evolving consumer demands and competitive pressures. Furthermore, external factors such as supportive government

policies, robust digital infrastructure, and capacity-building initiatives were identified as vital to fostering innovation and resilience among SMEs.

The significance of this study lies in its practical insights for SMEs, policymakers, and industry stakeholders. It underscores the necessity of creating a conducive ecosystem for digital adoption, highlighting the importance of strategic planning and collaboration to bridge resource and competency gaps. By addressing these challenges, SMEs can achieve sustainable growth and enhance their competitiveness in the global digital economy.

Future research should focus on longitudinal studies to better understand the long-term impacts of digital transformation on SME performance and resilience. Additionally, exploring sector-specific and micro-SME experiences will provide a more granular understanding of challenges and solutions. Research into the societal and environmental implications of digital transformation could also enrich the discourse, aligning business innovations with broader sustainability goals.

## **6.0 ACKNOWLEDGEMENT**

The authors would like to express their sincere gratitude to Universiti Poly-Tech Malaysia for providing the resources and support necessary to complete this study. We would also like to thank all participants who contributed their time and insights to this research. Special appreciation is extended to colleagues and peers who offered valuable feedback during the development of this manuscript.

## REFERENCES

- Alam, K., Ali, M., Erdiaw-Kwasie, M., Murray, P., & Wiesner, R. (2022). Digital transformation among smes: does gender matter? *Sustainability*, 14(1), 535. <https://doi.org/10.3390/su14010535>
- Alzahrani, J. (2019). The impact of e-commerce adoption on business strategy in saudi arabian small and medium enterprises (smes). *Review of Economics and Political Science*, 4(1), 73-88. <https://doi.org/10.1108/rebs-10-2018-013>
- Ayob, A. (2021). E-commerce adoption in asean: who and where? *Future Business Journal*, 7(1). <https://doi.org/10.1186/s43093-020-00051-8>
- Bodrov, V., Lazebnyk, L., Hurochkina, V., & Lisova, R. (2019b). Conceptual Scheme of Digital transformation of business model of industrial Enterprises. *International Journal of Recent Technology and Engineering (IJRTE)*, 8(3C), 107–113. <https://doi.org/10.35940/ijrte.c1018.1183c19>
- Costa, J. and Castro, R. (2021). Smes must go online—e-commerce as an escape hatch for resilience and survivability. *Journal of Theoretical and Applied Electronic Commerce Research*, 16(7), 3043-3062. <https://doi.org/10.3390/jtaer16070166>
- Foroudi, P., Gupta, S., Nazarian, A., & Duda, M. (2017). Digital technology and marketing management capability: achieving growth in smes. *Qualitative Market Research an International Journal*, 20(2), 230-246. <https://doi.org/10.1108/qmr-01-2017-0014>
- 
- Garzoni, A., Turi, I., Secundo, G., & Vecchio, P. (2020). Fostering digital transformation of smes: a four levels approach. *Management Decision*, 58(8), 1543-1562. <https://doi.org/10.1108/md-07-2019-0939>
- Gu, J. (2022). What drives smes to adopt e-commerce? the joint role of testosterone and absorptive capacity. *Asia Pacific Journal of Marketing and Logistics*, 35(1), 90-107. <https://doi.org/10.1108/apjml-07-2021-0487>
- Ibrahim, W., Turyakira, P., & Katumba, P. (2018). E-commerce adoption and growth of smes in uganda. *International Journal of Business and Management*, 14(1), 46. <https://doi.org/10.5539/ijbm.v14n1p46>
- Isa, S. and Alenezi, S. (2022). The relationship between the frequency of technology use and electronic commerce adoption among small and medium-sized enterprises in kuwait. *Asian Journal of Business and Accounting*, 15(1), 207-241. <https://doi.org/10.22452/ajba.vol15no1.7>
- Kartiwi, M., Hussin, H., Suhaimi, M., Razi, M., & Amin, M. (2018). Impact of external factors on determining e-commerce benefits among smes in malaysia. *Journal of Global Entrepreneurship Research*, 8(1). <https://doi.org/10.1186/s40497-018-0105-7>
- Khan, S., Majid, A., Yasir, M., Javed, A., & Shah, H. (2021). The role of social capital in augmenting strategic renewal of smes: does entrepreneurial orientation and organizational flexibility really matter?. *World Journal of Entrepreneurship Management and Sustainable Development*, 17(2), 227-245. <https://doi.org/10.1108/wjemsd-04-2020-0029>
- 
- Lei, J., Indiran, L., & Kohar, U. (2022). The digital transformation of smes: the difference between east and west in china. *International Journal of Academic Research in Business and Social Sciences*, 12(12).
-

---

<https://doi.org/10.6007/ijarbss/v12-i12/15718>

Martinelli, E., Farioli, M., & Tunisini, A. (2020). New companies' dna: the heritage of the past industrial revolutions in digital transformation. *Journal of Management & Governance*, 25(4), 1079-1106.

<https://doi.org/10.1007/s10997-020-09539-5>

Martins, A. (2022). Dynamic capabilities and sme performance in the covid-19 era: the moderating effect of digitalization. *Asia-Pacific Journal of Business Administration*, 15(2), 188-202. <https://doi.org/10.1108/apjba-08-2021-0370>

Nair, J., Chellasamy, A., & Singh, B. (2019). Readiness factors for information technology adoption in smes: testing an exploratory model in an indian context. *Journal of Asia Business Studies*, 13(4), 694-718.

<https://doi.org/10.1108/jabs-09-2018-0254>

Omelianenko, V. and Omelianenko, O. (2022). Issues of digital transformation of business models in the service sector.

*Economics & Education*, 7(1), 14-19. <https://doi.org/10.30525/2500-946x/2022-1-4>

Parida, V., Sjödin, D., & Reim, W. (2019). Reviewing literature on digitalization, business model innovation, and sustainable industry: past achievements and future promises. *Sustainability*, 11(2), 391.

<https://doi.org/10.3390/su11020391>

Priyono, A., Moin, A., & Putri, V. (2020). Identifying digital transformation paths in the business model of smes during the covid-19 pandemic. *Journal of Open Innovation Technology Market and Complexity*, 6(4), 104.

<https://doi.org/10.3390/joitmc6040104>

Rachinger, M., Rauter, R., Müller, C., Vorraber, W., & Eva, S. (2019). Digitalization and its influence on business model innovation. *Journal of Manufacturing Technology Management*, 30(8), 1143-1160. <https://doi.org/10.1108/jmtm-01-2018-0020>

Shahzad, A., Hassan, R., Abdullah, N., Hussain, A., & Fareed, M. (2020). Covid-19 impact on e-commerce usage: an empirical evidence from malaysian healthcare industry. *Humanities & Social Sciences Reviews*, 8(3), 599-609.

<https://doi.org/10.18510/hssr.2020.836>

Sinyuk, T., Panfilova, E., & Pogosyan, R. (2021). Digital transformation of sme business models as a factor of sustainable socio-economic development. *E3s Web of Conferences*, 295, 01028.

<https://doi.org/10.1051/e3sconf/202129501028>

Tahiri, S. (2022). The impact of digitalization on firms' business models: opportunities and limitations for digital leader.

*Journal of Advanced Research in Leadership*, 1(1), 13-32. <https://doi.org/10.33422/jarl.v1i1.173>

Teng, X., Wu, Z., & Yang, F. (2022). Research on the relationship between digital transformation and performance of smes. *Sustainability*, 14(10), 6012. <https://doi.org/10.3390/su14106012>

Xin, Z., Xu, Y., & Ma, L. (2022). Research on successful factors and influencing mechanism of the digital transformation in smes. *Sustainability*, 14(5), 2549. <https://doi.org/10.3390/su14052549>

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Ziółkowska, M. (2021). Digital transformation and marketing activities in small and medium-sized enterprises.

Sustainability, 13(5), 2512. <https://doi.org/10.3390/su13052512>