DIGITAL BUSINESS MODEL INNOVATION AND SMEs COMPETITIVENESS: THE CONTINGENT ROLE OF ORGANIZATIONAL CULTURE

TEOH MING FANG

UNIVERSITI SAINS MALAYSIA

2022

DIGITAL BUSINESS MODEL INNOVATION AND SMEs COMPETITIVENESS: THE CONTINGENT ROLE OF ORGANIZATIONAL CULTURE

by

TEOH MING FANG

Thesis submitted in fulfilment of the requirements
for the degree of
Doctor of Philosophy

April 2022

ACKNOWLEDGEMENT

In the preface, I would like to express my sincere gratitude to the people who were involved directly or indirectly contributed to the success of my PhD journey. First and foremost, I am deeply grateful to my supervisor, our Dean and mother of SOM, Professor Dr. Noor Hazlina Ahmad, for the non-financial and financial assistance that are extremely vital to me and made this roller-coaster journey smoother and steadily. I would also extend my sincere thanks to my co-supervisor, Associate Professor Dr. Hasliza Abdul Halim. Both of you are amazing supervisors to me, and thank you so much for your support at every stage of this study. Your guidance, patience and brilliant feedback are valuable to me going through this challenging journey.

My sincere and heartfelt thanks to all examiners, Dr. Rosmelisa Binti Yusof, Associate Professor Dr. Hazril Izwar Ibrahim, and Professor Dr. Chandrakantan Subramanian, to highlight the areas for improvement and providing insightful comments to improve the quality and value of the thesis.

I would like to extend my appreciation and profound gratitude to the financial support of the FRGS Grant (203/PMGT/6711700) from the Ministry of Higher Education Malaysia, all respondents involved in the preliminary interviews and survey questionnaire, the academicians who participated in the pretest.

My special thanks also go to Professor Ramayah A/L Thurasamy, who conducted the workshops, which is very important to support my write-up in Chapter 3 and Chapter 4, and the lovely supporting staffs, Pn. Robitah Bt Spian, Pn. Nursyafinatuljannah Bt Anuar, Cik Syarifah Norsyamsuhaida Bt Said Samsuddin assisted me with the

administrative processes, and also the staffs who extended their kind assistance to me throughout the PhD journey.

In addition, I would like to offer my deepest appreciation to my beloved husband, Ng Hong Guan, and all of my family members for their unconditional love, unwavering support, understanding, and belief in me.

Last but not least, thanks to all of my wonderful friends in the PGA SOM group (2018/2019) and those we met in the School of Management for your kind suggestions and memorable memories.

TABLE OF CONTENTS

LIST OF TABLES

Page

LIST OF FIGURES

Page

LIST OF ABBREVIATIONS

AI	Artificial Intelligence
AR	Augmented Reality
AVE	Average Variance Extracted
AWS	Amazon Web Services
BSN	Bank Simpanan National
CB-SEM	Covariance-Based Structural Equation Modelling
CEO	Chief Executive Officer
CFO	Chief Financial Officer
CMV	Common Method Variance
CR	Composite Reliability
DBMI	Digital Business Model Innovation
DC	Digital Capability
e-HRM	Electronic Human Resource Management
EL	Entrepreneurial Leadership
ERP	Enterprise Resource Planning
EU	European Union
f^2	Effect Size

GDP	Gross Domestic Product
GLOW	Global Online Workforce
GS	Government Support
HRDF	Human Resources Development Fund
HTMT	Heterotrait-Monotrait Ratio of Correlations
ICT	Information and Communication Technology
IoT	Internet of Things
IT	Information Technology
JIT	Just In Time
M-commerce	Mobile Commerce
MCO	Movement Control Order
MDEC	Malaysia Digital Economy Corporation
MTDC	Malaysian Technology Development Corporation
NESDC	National Entrepreneur and SME Development Council
OC	Organizational Culture
PLS-SEM	Partial Least Square Structural Equation Modelling
POS	Point of Sales
Q^2	Predictive Relevance

R^2	Coefficient of Determination
R&D	Research and Development
RBV	Resource-based View
SCORE	SME Competitiveness Rating for Enhancement
SMEs	Small and Medium-sized Enterprises
UET	Upper Echelon Theory
UOB	United Overseas Bank
US	United States
VCRI	Value Creation Innovation
VCAI	Value Capture Innovation
VDI	Value Delivery Innovation
VIF	Variance Inflation Factor
VPI	Value Proposition innovation

LIST OF APPENDICES

INOVASI MODEL PERNIAGAAN DIGITAL DAN DAYA SAING PKS: PERANAN KONTINGEN BUDAYA ORGANISASI

ABSTRAK

Perusahaan kecil dan sederhana (PKS) memainkan peranan utama dalam memupuk prestasi ekonomi digital Malaysia. Untuk mencapainya memerlukan inovasi model perniagaan digital untuk meningkatkan fleksibiliti dan kelajuan PKS bertindak balas terhadap perubahan pasaran dalam landskap digital yang tidak stabil. *Upper echelon theory*, *dynamic capabilities theory*, dan *institutional theory* digunakan dalam kajian ini untuk menyelidiki hubungan antara kepimpinan keusahawanan, keupayaan digital, dan sokongan kerajaan dengan penerapan inovasi model perniagaan digital (IMPD) (iaitu, inovasi penciptaan nilai, inovasi proposisi nilai, inovasi penyampaian nilai, dan inovasi penangkapan nilai). Penyelidikan ini meneliti hasil IMPD mengenai daya saing PKS dan kesan moderasi budaya organisasi dalam hubungan antara daya saing IMPD dan PKS dalam konteks PKS, Malaysia. Temu ramah awal dilakukan di antara empat pemilik perniagaan / pengarah urusan / pengurus atasan PKS Malaysia untuk memahami bagaimana mereka mengapdopsi IMPD, cabaran yang dihadapi semasa penerapan IMPD, mengenal pasti anteseden dan hasil IMPD. Data empirikal dikumpulkan dari 132 PKS di Malaysia dengan menggunakan Teknik Persampelan Bertujuan. Hasil kajian menunjukkan bahawa kepimpinan keusahawanan dan keupayann digital mempunyai pengaruh positif yang signifikan terhadap semua elemen IMPD, dan keupayaan digital mempunyai pengaruh paling kuat. Selanjutnya, sokongan kerajaan mempunyai pengaruh positif dengan inovasi proposisi nilai, inovasi penyampaian nilai, dan inovasi

penangkapan nilai, sementara itu tidak mempunyai hubungan yang signifikan dengan inovasi penciptaan nilai. Dari segi daya saing PKS, data empirikal menyokong hubungan positif antara inovasi proposisi nilai dan daya saing PKS. Untuk kesan moderasi budaya organisasi, kajian ini mendapati bahawa hubungan positif antara inovasi penyampaian nilai dan daya saing PKS akan menjadi lebih kuat apabila budaya organisasi tinggi. Hasil kajian memberikan sumbangan teori dan praktikal. Ia boleh menjadi garis panduan yang berguna bagi PKS di Malaysia yang berjuang untuk mengapdopsi IMPD dan menyumbang pengetahuan IMPD kepada usahawan, pembuat polisi, penyelidik, dan ahli akademik. Akhir sekali, limitasi dan cadangan untuk kajian masa depan dibincangkan.

DIGITAL BUSINESS MODEL INNOVATION AND SMEs COMPETITIVENESS: THE CONTINGENT ROLE OF ORGANIZATIONAL CULTURE

ABSTRACT

Small and medium-sized enterprises (SMEs) play a predominant role in fostering the digital economic performance of Malaysia. Achieving this requires innovating digital business models to improve the flexibility and speed of SMEs responding to market changes in a volatile digital landscape. Anchored on upper echelon theory, dynamic capabilities theory, and institutional theory, this study endeavours to investigate the relationship between entrepreneurial leadership, digital capability, and government support with digital business model innovation (DBMI) adoption (i.e., value creation innovation, value proposition innovation, value delivery innovation, and value capture innovation). This research examines the outcome of DBMI on SMEs' competitiveness and the moderating effect of organizational culture in the relationship between DBMI and SMEs' competitiveness in the context of SMEs, Malaysia. Preliminary interviews were conducted among four business owners/ managing directors/ top managers of Malaysian SMEs to understand how they adopt DBMI, the challenges encountered during the adoption of DBMI, identify the possible antecedents and outcome of DBMI. The empirical data were collected from 132 SMEs in Malaysia by using the purposive sampling technique. The findings revealed that entrepreneurial leadership and digital capability have a significant positive influence on all elements of DBMI, and digital capability has the strongest effect. Furthermore, government support positively affected value

proposition innovation, value delivery innovation, and value capture innovation, while it does not have a significant relationship with value creation innovation. The empirical data supported the positive relationship between value proposition innovation and SMEs' competitiveness. For the moderating effect of organizational culture, this study found that the positive relationship between value delivery innovation and SMEs' competitiveness will be stronger when organizational culture is high. The research findings offer both theoretical and practical contributions. They can serve as a useful guideline for SMEs in Malaysia that are struggling to adopt DBMI and contribute to the knowledge of DBMI to entrepreneurs, policymakers, researchers, and academicians. Lastly, the limitations and recommendations for future study were discussed.

CHAPTER 1
INTRODUCTION

1.1 Background of Study

Conventional business models have been massively affected by digitalization, the Covid-19 pandemic, volatile market environments and customers' digital needs (Priyono et al., 2020; Wirtz, 2019). The purchase behaviour of global customers is constantly changing, and they are getting more digital-oriented. Hence, adopting digital business model innovation (DBMI) can improve market expansion and cross-border transactions; for instance, European customers often purchase goods from Ali Express (Verhoef & Bijmolt, 2019). However, the study by Teoh et al. (2022) revealed the low DBMI adoption of Malaysian SMEs, in which SMEs are using basic digital technologies to manage business operations.

On the other hand, the consequences of SMEs that resist adopting DBMI include difficulty evaluating customers' unmet needs, limiting their capabilities to share the integrated data with partners, and having limited expansion strategies (Woerner, 2019). Other consequences entail not being able to collaborate with partners that pursue digital transformation strategy (Bouwman et al., 2019), inefficient internal and external processes (Bouncken et al., 2019; Sathananthan et al., 2017), stagnant business performance and competitiveness (Phillip, 2020; Suhendra, 2017), affect their business survival during the time of crisis (Chen et al., 2021), and unable to fulfil market expectation (Sathananthan et al., 2017).

Digitalization leads to a growing number of new and competing organizations in the digital marketplace, given that digital businesses can establish their virtual business to serve customers in multiple countries without buying or renting physical outlets. Consequently, global small and medium-sized enterprises (SMEs) compete

more intensely, seeking ways to adopt digital business model innovation (DBMI) to support business growth, efficient internal processes, higher productivity at lower operating costs. For example, SMEs can incorporate automation and robotics in the production line to maintain consistent quality with error-free. In addition, the study conducted by Ansong and Boateng (2019) posit that digital enterprises in Ghana employ social networking service to interact with customers and enhance their experiences at lower costs.

Value creation, value proposition, value delivery, and value capture are the critical elements of a business model (Dasí et al., 2017; Faghih et al., 2018; Suhendra, 2017). SMEs can innovate their business model digitally in the digital landscape. This is known as digital business model innovation (DBMI), in which organizations use digital technologies to make significant changes to any elements of a business model (International Association of Controllers, 2017; Remane et al., 2017). SME in Malaysia, such as Pott Glasses, using augmented reality (AR) to offer virtual try-on service to customers, whereby customers can preview their appearance with the preferred glasses thru Safari or Google chrome; on top of that, Pott Glasses offer online vision test to their customers too (Lim, 2020; Pott Glasses, 2020). Indeed, SMEs can exploit opportunities, be flexible and creative to raise their competitiveness in the fierce competition by offering innovative digital products and services to satisfy the needs of digital customers.

By 2024, SME Corporation Malaysia expects all SMEs in Malaysia to use digital technologies to manage customer databases and business activities (The Star, 2019). Lazada Malaysia allocated RM10 million to launch “Pakej Kedai Pintar” from April until June 2020, with the initiative to support 50,000 domestic SMEs to adopt an e-commerce business model during the Covid-19 pandemic at zero cost and offer other

benefits such as free shipping, enjoy microloan, and training to SMEs via Lazada University (The Edge Markets, 2020). This initiative further supports SMEs in innovating existing business models digitally and adopting DBMI.

Although SMEs have limited resources, compared with large firms, they are more flexible to change the existing business model. In addition, Kwarteng et al. (2021) found that strong organizational culture can strengthen a shared assumption and stimulate employees to support an innovative business model to achieve higher performance. Organizational culture can shape employee attitudes, foster innovative practices and transform them into business operational success (Anning-Dorson, 2021; Azeem et al., 2021). Santa-Maria et al. (2021) revealed organizational culture strongly moderates the relationship between circular business model innovation and economic and environmental performance. Foss and Saebi (2017) suggest future studies to examine the moderator role of organizational culture in the relationship between business model innovation and business performance. Indeed, the effort to implement DBMI has become elusive without knowing the antecedents and outcome of DBMI. Therefore, the present study is concerned with: "What drives SMEs in Malaysia to venture into DBMI and how does DBMI influence SMEs' competitiveness?"

1.1.1 Overview of SMEs in Malaysia

Given volatile business trends, structural changes, and price inflation, the new definition for SMEs was implemented in July 2013, and all SMEs must have registered with the Companies Commission of Malaysia (Suruhanjaya Syarikat Malaysia) or local authorities such as the Sabah State Government, Dewan Bandaraya Kota Kinabalu (for Sabah), Kuching North City Hall (for Sarawak) (Dewan Bandaraya Kota

Kinabalu, 2022; Kuching North City Hall, 2022; Sabah State of Government, 2022; SME Corporation Malaysia, 2021e, 2022).

In 2020, SME Corporation Malaysia (2021c) showed that there are 1151339 SME establishments in Malaysia, and it includes 85.5% of SMEs in the service sector, 7.4% in the construction sector, 5.1% in the manufacturing sector, 1.7% in the agriculture sector, 0.3% in the mining and quarrying sector.

The definition of SMEs is determined by two main criteria: annual sales turnover and the number of full-time employees. SMEs in the services and other sectors in Malaysia have yearly sales of up to RM20 million or up to 75 full-time employees, while SMEs in the manufacturing industry have sales turnover not exceeding RM50 million or up to 200 employees (SME Corporation Malaysia, 2021e).

SMEs play an essential role in the economic growth of Malaysia. As compared to the year 2018, SMEs contributed more to GDP (at constant 2015 prices) and exports in the year 2019, which is RM552.3 billion (38.9%) and total exports at RM176.3 billion (17.9%), employed 7.3 million people (Department of Statistics Malaysia, 2020b). However, due to the impact of Covid-19, in 2020, SME contribution to Malaysia's GDP fell from 38.9% to 38.2%, export decreased from 17.9% to 13.5%, and employment provided by SMEs were reduced from 7.3 million to 7.25 million people (Department of Statistics Malaysia, 2021). Although many SMEs were affected by the negative impact of the Covid-19 pandemic, this threat and the influence of digitalization force SMEs to venture into the digital business model innovation to achieve a competitive advantage.

1.1.2 Digitalization and its Influence on Organization

Digitalization exerts unprecedented disruptions on business models and organizations regardless of its business size and structure. Rantala, Ukko, Saunila, Puolakoski, & Rantanen (2019) highlight that digitalization affects traditional and physical business in both internal and external operations. They further explain that to implement digital operations, an organization needs to digitalize existing business practices and provide more e-services. The competition level in the digital world is more intense than in traditional business due to the low entry barrier and initial capital investment (Rantala et al., 2019). Digital business differs from traditional business as SMEs can virtually manage business activities, collaborate and exchange databases with business partners, and use existing online platforms to interact with global suppliers and customers. Customers can raise any complaints or request technical assistance via an online chat box instead of visiting the physical store far away from their homes.

With digitalization, the existing business model could be obsolete and unable to fulfil customers' future requirements. SMEs need to review and reconfigure their business model, resulting in digital business model innovation to raise competitiveness in the digital world. Digitalization pertinent to services and database positively affects organizational performance (Martín-Peña et al., 2019). Digitalization with the effective use of digital technology influences the business model and communication channels with employees (North et al., 2019). Examples of digital technologies include artificial intelligence, chatbot, digital twins, internet of things, wearable technologies, analytics, social media, big data, cloud computing, cyber-physical systems, augmented and virtual reality (Khin & Ho, 2019; Urbinati et al., 2018; Zaki, 2019).

Digitalization stimulates the extensive use of digital technology, digital platforms, and the establishment of digital business. For example, Google 3D animals allow users to search for augmented reality animals and better understand animal attributes (Phelan, 2020). Likewise, IKEA Place is an augmented reality application that allows targeted customers to virtually place the 3D furniture before a making purchase decision (Khin & Ho, 2019). There are four major digitalization areas: digital interface, automation, connectivity and data (Sehlin et al., 2019). Sehlin et al. (2019) postulated that public utilities install digital sensor systems to trace any problem pertinent to heat, airing, and calibration of the buildings to offer better customer solutions; digital systems were used by the business to gather and secure information. It demonstrated that public utilities incorporated digital technologies to digitalize their business processes and deliver new values to customers (part of DBMI adoption).

To sum up, digitalization is associated with using digital technologies to exploit digital opportunities, produce completely new products and services at lower production costs, optimize existing production capacity and communicate effectively with stakeholders (Rachinger et al., 2018). Besides that, organizations can deploy digital technologies to transform existing business processes into digital ones (Bouncken et al., 2019).

1.1.3 The Importance of Business Model

The business model is a navigator that incorporates architecture on optimizing the organization's resources to create and deliver values to customers at an effective cost and capture higher revenue and profits (Teece, 2018). Without it, SMEs lack

direction on coordinating their business activities and offering differentiated value-added products/services to the customers in the domestic and global marketplace.

There is a consensus among researchers that the business model can explain how SMEs create values, manage business activities, capture sustainable revenues and operating profit (Remane et al., 2017). Furthermore, Boojihawon and Ngoasong (2018) assert that a business model is a critical tool that can implement an organization's strategy to offer new products and services, organize business structure and practices in the most efficient way.

Once the business model is finalized, management has to decide the types of internal and external resources used to deliver values to the customers (Teece, 2018). Teece (2018) posits that it is crucial to ensure successful business model implementation using appropriate tangible assets and machines. When SMEs lack functional expertise to manage business operations, they can outsource certain functional activities to external partners instead of managing them by themselves at a higher cost, are less efficient, and unable to focus on their core business.

Business model pioneers could not achieve a competitive advantage in the long term, as competing organizations may imitate their business models and adversely affect their competitiveness. Therefore, the organization can integrate its intangible assets and strategy into a business model to resolve this issue. Intangible assets are the unique resources for each organization, and not all of them possess the same intangible assets. When is coupled with strategy and business model, the organization can prosper in the fierce competition. The competitive business model is appropriate for different market segments, in which an organization must determine its targeted customer and communicate its offerings to them (Teece, 2018). SMEs can develop different agile

business models to compete with rivalries with similar business sizes and sustain their business over larger organizations (Parnell et al., 2018).

Alarmingly, a business model cannot permanently remain status quo due to the rapidly changing external environment. Therefore, organizations can review business models regularly and be proficient in making changes to the existing business models when necessary.

1.1.4 The Importance of Business Model Innovation (BMI)

Business model innovation refers to the novel changes in the main elements of the business model and the way they correspond with business partners, existing and new customers (Bouwman, Nikou, Molina-Castillo, & de Reuver, 2018; Wahyono, 2018). Rachinger et al. (2018) support these view, who posit that innovating existing business models with new offerings can fulfill customer requirements and strengthen the collaboration relationship. Innovation in products and services, business processes, and practices leads to the changes in value creation, value proposition, value caption, and delivery of SMEs (Bouncken et al., 2019; Bouwman et al., 2018). Therefore, business model innovation undertaken by SMEs can escalate their competitiveness and business performance (Pucihar et al., 2019).

A broader perspective by Teece (2018) argues that substantial changes on the business model for small business does not guarantee superior performance if the organization lacks commitment from different parties and possesses strong financial resources (Nunes & Russo, 2019). For instance, small taxi businesses cannot duplicate the Uber business model because it involves huge initial capital, advanced technologies, and a strong management team (Teece, 2018). Notwithstanding, SMEs

are more flexible to innovate their business model than large firms. Small changes in the current business model can increase value capture (Teece, 2018). He further asserts that innovating a business model which is compatible with the organization's resources and serving the right customer segment can lead to business sustainability in the long term.

1.1.5 The Importance of Digital Business Model Innovation (DBMI)

In the digital era, SMEs' competitiveness not only depends on their strategic resources but also on digital business model innovation (DBMI). DBMI is a supreme weapon that can help SMEs raise their competitiveness and achieve extraordinary performance. Without DBMI, SMEs may encounter difficulties creating star and cash cow products to gain higher market share, satisfy customers' digital needs, collaborate with new business partners, and growth opportunities. Digital businesses primarily incorporate digital technologies such as cloud computing, big data analytics, and social networks sites (Facebook, Twitter) in their business model to manage internal and external operations (Ansong & Boateng, 2019).

A business model can be known as digital when the organization applies digital technologies to do notable changes to business elements (Remane et al., 2017), such as value creation innovation, value proposition innovation, value delivery innovation, and value capture innovation. Value creation innovation refers to the ability of SMEs to utilize their new core capabilities, digital technology, partnerships, and efficient value-added processes to create new values for main stakeholders (Clauss et al., 2019; Still et al., 2017). Value proposition innovation emphasizes using digital technology to develop a new product/ service portfolio and customer relations (Clauss et al., 2019;

Panda, 2019; Still et al., 2017). Value delivery innovation is associated with using digital technology to establish a new channel of delivery and market segments (Clauss et al., 2019; Panda, 2019; Still et al., 2017). Finally, value capture innovation explains SMEs' ability to use digital technology to transform its value proposition into new revenues at effective cost (Clauss et al., 2019; Still et al., 2017). Section 2.4 discusses each of the DBMI elements in detail. Indeed, not all organizations adopt DBMI by implementing the innovation on the four DBMI elements and following the definition suggested by Clauss et al. (2019), Panda (2019), and Still et al. (2017). For example, some organizations may adopt DBMI by innovating two or three DBMI elements. For example, some organizations could perform value creation innovation that focuses on new business processes and digital technologies to improve operational efficiency instead of focusing on all dimensions of value creation innovation to create new values for the stakeholders. In particular, those organizations that implement any dimensions of value creation innovation, such as developing new capabilities or new partnerships or new business processes, or adopting new digital technologies, were categorized as value creation innovation (part of DBMI adoption).

DBMI associated with organization employ digital technologies to innovate any two business model elements (International Association of Controllers, 2017). The organization should prioritize the DBMI as a business strategy and select the relevant digital technologies to implement it (Köbnick et al., 2020). Innovating business models digitally, such as configuring cloud computing, 3D printing, virtual reality, big data, and the internet of things (Corsaro, 2018), results in new or improved revenue streams. Speaking in terms of smart waste management business, fill level sensors (IoT) were employed to coordinate the routes, emptying schedule, and optimize the waste collection process (Aagaard et al., 2018). The business used the IoT to optimize the

business processes, reduce redundancy/ inefficient schedule arrangement and minimize the associated costs (part of value creation innovation and value capture innovation).

Innovating a digital business model requires the organization to decide on changes in business model elements and the outcomes. For example, determine the new targeted market segments with new offerings (digital products and services), look for potential business partners that support DBMI, outsource tasks and provide complementary services (Remane et al., 2017). Blaschke et al. (2017) argue that three approaches to innovating the digital business model (DBM) are developing the key elements of DBM coupled with business strategy; next, looking for potential synergies; and lastly, determining how to employ digital technology in the digital business model.

Without thorough planning on DBMI, it will inhibit its implementation. Sathananthan et al. (2017) presented the design process of DBMI. It begins with assessing the current business model innovation framework, developing SWOT analysis, generating ideas on the possible changes and the implementation methods of DBMI (with the inclusion of digital technology), and lastly evaluating data related to the DBMI framework to avail future innovation activities.

Business expansion depends on the efficient function of digital technology. SMEs can install a cyber-physical system to revamp existing business operations and provide better customer solutions (Bouncken et al., 2019; Martín-Peña et al., 2018). DBMI requires the collaboration of different parties in supply chain management, innovation activities, and integrated production resources (Martín-Peña et al., 2018).

Forecasting and assessing market needs through market research are essential to offering superior customer solutions and maintaining market position. Moreover, SMEs should change their business model by using digital technology (Faghih et al.,

2018) to develop new capabilities (Parida et al., 2019). More importantly, SMEs need to identify the drivers of DBMI (embedded with the blue ocean strategy) and be customer and future-oriented by offering the right products and services to raise SMEs' competitiveness.

1.2 Preliminary Interview Findings

A preliminary interview was carried out to obtain insights on DBMI adoption among SMEs in Malaysia. Indeed, the preliminary study can ascertain whether literature and anecdotal evidence reflect the real-life situation besides verifying SMEs' perceptions pertaining to the areas of prior research interest. Preliminary interviews allow the researcher to gain useful knowledge on DBMI and its issues in the real business environment, particularly among SMEs, to support the research problem of the present study. Furthermore, preliminary interview findings complement the literature, allowing the researcher to develop a research framework for this study.

In this regard, a preliminary interview was conducted with four SMEs (business owners/ managing directors/ top managers) in Malaysia to unearth the adoption of DBMI, its issues, barriers, and consequences to their business. The interviews were conducted in September and October 2020 at the respective organization. They were labelled as respondent A, B, C, and D. The findings are important to support the development of the problem statement and determine the key antecedents that influence DBMI adoption, which subsequently improve SMEs competitiveness.

Respondents were asked several questions particularly related to their perceptions of DBMI, their adopted business model, driving factors that stimulate them to adopt DBMI, challenges encountered in the DBMI adoption process, and the outcomes of

DBMI. Correspondingly, the area of interest was grounded by literature reviews and anecdotal evidence. The key questions for respondents are:

1. Their perception and understanding of DBMI
2. The challenges faced by the organization during the DBMI adoption process
3. Antecedents contributing to DBMI adoption in the organization
4. How does the adoption of DBMI enhance an organization's competitiveness?

Company background

Respondents A and B in the manufacturing sector operate their businesses for more than 10 years, respondents C and D in the service sector operate for more than 6 years. Respondent A is a small-size business that manufactures and sells baby products in the physical store and virtual platform. It has 7 employees, with an annual sales turnover of more than RM300,000. Respondent B is a medium-size original equipment manufacturer (OEM) that manufactures rubber-related products for large retailers. It has 350 employees and an annual sales turnover not exceeding RM50 million. In the service sector, respondent C and respondent D are small businesses with sales turnover within RM 300,000 to not exceeding RM3 million. Respondent C is a trading company that sells industrial assembly technology and machines. It has 7 employees. Respondent D is an international agent for Taobao, Alibaba, and Tmall, helping customers buy goods from China and deliver it to them. It has 5 employees.

Theme 1: Digital business model innovation (DBMI)

Respondent A: The general manager explained that even though they always review and innovate existing business models digitally to sustain the business in the

digital era, they did not term this practice as DBMI. Value creation innovation includes training employees to support DBMI, a new thumbprint system to record human resources attendance and working hours, a new Autocount system to manage stock, invoices, issue purchase orders and accounting systems. At the same time, they are using excel to record the sales of baby fairs, historical data, forecasting sales, and inventory for the following months. These systems can help to achieve cost efficiency, optimize business processes and operations. Traditionally, they manufacture and sell the finest quality baby products. She mentioned that, they use digital platforms for value proposition innovation to offer professional customer service, speedy and reliable product delivery, establish strong trust, credibility, and good relationship with customers. The business provides honest and easy return service to customers and prompt replies to customer questions and feedback. In terms of value delivery innovation, other than retailers' physical stores, the business sells the products on online platforms to ease customers' purchases and increase their satisfaction. The business uses email, WhatsApp, and social media to communicate with new and existing suppliers, wholesalers, retailers, employees and customers. Value capture innovation is associated with cost reduction by using new online platforms and efficient systems while earning new revenue sources from online stores.

Respondent B: The managing director stated that DBMI is a new term, and he is not sure what the organization is doing now can be referred to as "DBMI" or not. He mentioned that value creation innovation includes providing regular training to improve employee competencies, the business employing a new digital sensor to control the machines, a new thumbprint system to record employees' attendance, new digital printing machine at higher quality to print the customized design on rubber related products based on large retailers' orders, new automated machine to do the

finishing such as rolling and packaging, new SQL system to manage inventory, raw materials, accounting and point of sales (POS) system; they are using large retailers' real-time system to key in the relevant information for the product specification and access packaging instruction. Lastly, they access large retailers' integrated quality system to receive feedback and returns of the products from customer/end-user without any valid reason due to the large retailer's policy that allows customers to return the goods within one year. For value proposition innovation, rubber technologists always do research and development (R&D). The business diversified product ranges and evolved from manufacturing niche products to mass customized products using natural rubbers of higher quality, safe, and environmentally friendly. Furthermore, they practice a just-in-time (JIT) inventory system with the large retailers and suppliers. The innovative and customize products based on customers' latest needs, at a competitive price able to satisfy customer demands and establish a profitable relationship with the large retailers. Also, they offer virtual and physical support services to large retailers. They have received rewards such as a vendor of the year, a national award for the export of rubber products, and an innovation award. Value delivery innovation involves targeting new large retailers (customers) in the EU, USA, etc, and receiving inquiries from email and website only. The managing director stated that the business is 100% export business. Digital channels were used to communicate and exchange data with foreign customers. He mentioned that the business tried to use social media such as Facebook, Shopee, and Lazada to sell the product, but they did not attain positive responses. Value capture innovation related to cost efficiency due to the efficient system aforementioned and earn new sources of revenue from new offerings and new customers (large retailers). However, he highlighted that cost and revenue structure increase simultaneously. For example, foreign retailers require the

business to use their integrated system for reporting and data-entry purposes, some retailers demand the business use a particular invoice format. Consequently, the business must hire new employees for these additional tasks, leading to high costs and low profit margins.

Respondent C: The Director mentioned that they are always seeking innovative ways to revamp the existing business model by using digital technology to satisfy customer requirements and respond proactively toward Industry 4.0. Evidently, they are incorporating DBMI, but DBMI is still a new term for them. He posited that value creation innovation includes providing face-to-face training on Industry 4.0 and receiving virtual training from suppliers to support DBMI. Their new and existing partners are mainly in the US, Germany, Malaysia, and Southeast Asia. New digital technology was employed to support automated machines. To become more efficient, they will upload a pre-recorded video to Youtube instead of physical demonstrations, always looking for a new approach to simplify internal processes. Speaking in terms of value proposition innovation, they offer new and innovative products, solutions, and ideas to customers. They provide on-site testing of the digital machines, professional and technical advice, free trial on the assembly machines and tools, virtual support, and demonstration to enhance customers' production quality (visit them if necessary). Value delivery innovation related to targeting new customers manufacture high-end products in Southeast Asia, especially the new projects by private businesses. He highlighted that there are two types of customers. Firstly, customers who need more clarification confirm some details, and they have basic ideas on digital machines. Secondly, customers with limited knowledge of digital machines want to learn, seeking some relevant machines for the new venture. New and existing channels to communicate and deliver values to customers include Google Ads, social media,

website, email, Youtube, business Whatsapp group to send latest catalogues, virtual exhibition due to Covid-19 (30 minutes' slot meeting). Value capture innovation pertaining to lower cost when exporting digital machines to foreign countries, with assistance from a flexible logistics partner that charges lower prices and faster and speedy procedures. New revenue streams comprise rental fees of digital machines (bound with terms and conditions) and cross-selling. When customers purchase a digital machine, the staff will suggest the purchases of relevant parts and convince customers to buy it together.

Respondent D: The business owner understands the definition of a business model. It refers to making changes to the business model digitally and innovatively. DBMI is not a new concept in the digital landscape, but indeed is a new term for him. He delineated that value creation innovation of the business primarily on the new customized digital system to manage orders, shipment, and tracking system that improve the business's internal processes. Customers will email to ask about product specifications, the staff uses Ali wangwang (instant messaging platform) to deal with suppliers and receive their reply. Customers can do payments to the staff through the PayPal system by using a credit card, and the staff uses Alipay to make payments to relevant suppliers. The online inventory system of business partners helps the business to manage goods at the Guangzhou warehouse. New and existing logistic partners include ABX, Skynet, Gdex, etc. The business's value proposition innovation is helping customers buy products from Taobao, Alibaba, and Tmall. The business uses online advertisements such as Google ads, Facebook ads, and search engine optimization to stimulate new and repeat purchases and remind customers of the business's services. For value delivery innovation, the business targets customers located in Malaysia and Singapore, using social media and the relevant systems to

deliver services to customers. Value capture innovation on cost reduction by using an online inventory system instead of going to China frequently to manage the goods in the warehouse. The business no need to rent a warehouse in Malaysia too. It has a reliable logistic partner to avoid delivery delay that could lead to losses and customer complaints. For new sources of income, other than earning from service charges at 9% on total purchases, the business gains from lower currency exchange rates when charging higher exchange rates to customers.

In sum, the findings illustrate that all SMEs adopt DBMI via value creation innovation, value proposition innovation, value delivery innovation and value capture innovation at the initial stage that involves basic digital technologies/systems.

Theme 2: Issues and challenges during DBMI adoption

It is not peculiar that any new changes tie with certain obstacles and challenges. The first step is always the difficult one. Respondent A mentioned that they are learning and adopting DBMI. Some employees may face difficulties using specific systems, but they communicate and convince employees to learn and practice it to sustain the business. When encountering problems, employees can get support from top managers.

Respondent B emphasized that it takes time to learn how to incorporate automated machines into the production process. It is challenging as not all digital machines are suitable for the business due to customized orders requiring different formulations, mixing more than 150 compounds with various ingredients, and mouldings. The business is seeking the most appropriate digital machine to replace some of the manual production processes. The business uses large retailers' real-time

systems to key in the relevant information for the product specification and access the packaging instruction, using large retailers' integrated quality systems to receive feedback and returns from customer/end users, which results in heavier workloads and new employees are needed to key in the relevant data. Another challenge is to scout for a better digital system/software to digitalize the internal processes of functional departments. For instance, an e-HRM system can synchronize the employee's working hours with the payroll. Finally, not all newly adopted digital technology and automated machine can integrate well with the existing ones and yield the expected outcomes. To overcome these challenges, the business is still constantly looking for digital experts who can assist them in adopting DBMI efficiently and effectively.

As mentioned by respondent C: "During DBMI adoption, there are employee grievances on spending more time, efforts and higher workload to support DBMI". The director uses monetary rewards to motivate employees to receive more inquiries from online platforms, websites and social media. The director will trace whether the orders were placed on the online platform and give rewards accordingly.

The challenge confronted by SME D is that the business owner spends much money searching for the best-customized system to manage the business. They perform a trial run to determine errors and make changes accordingly. Unfortunately, some systems are too vulnerable and are hacked easily. The staff will record the logistics partner's delivery speed, and the business owner will change the logistic service if necessary.

It was observed that SMEs A, C, D found responsive solutions to overcome the challenges. As demonstrated in SME C, employees can earn more income, and the business can attain positive results. On the contrary, SME B is trying their best to

search for external experts to support their DBMI adoption and digital transformation pathway.

Theme 3: Antecedents of DBMI

From the literature review, there are antecedents that can influence a business model, e-commerce business model adoption, business model innovation, digital orientation, digital innovation, digital business model, and digital business model innovation. It includes technology turbulence, innovation activities (Bouwman et al., 2018), digital technology, external environmental pressures, cross functional integration (Quinton et al., 2017), digital technology, organizational culture (Chen et al., 2021), business environment and information technology (Pucihar et al., 2019), integrative capability (Pang et al., 2019), relative advantage, perceived complexity, employee capability and skills (Low et al., 2021), digital business leadership (Kreutzer et al., 2018), digital leadership (Mihardjo et al., 2019), entrepreneurial leadership (Phangestu et al., 2020; Schoemaker et al., 2018; Simba & Thai, 2019; Volery & Mueller, 2018), entrepreneurial orientation (Dewi & Ahamat, 2018), digital supply chain capabilities (Queiroz et al., 2019), information technology (IT) capabilities, strategic capabilities (Gauthier et al., 2018), IT capabilities (Riera & Iijima, 2019), digital capabilities (Da Silva Freitas Junior et al., 2017; Lenka et al., 2017; Wetering et al., 2018), digital service capabilities (Wulf et al., 2017), digital technology and digital capabilities (Khin & Ho, 2019), government support (Chau et al., 2020; Chen et al., 2021; Mohtaramzadeh et al., 2018; Suresh & Venkateswara Prasad, 2019). In addition, it was found that entrepreneurial leadership, digital capability and government support was the antecedents that frequently mentioned by prior studies. Therefore, these antecedents were incorporated into the present study.

Respondent A: “Entrepreneurial leaders who can take calculated risks, solve the problem using innovative ways, visionary for future changes and trends, always encourage employees to do the tasks innovatively are crucial to support DBMI”. The business’s digital capability to seek new and affordable digital technologies to raise efficiency, productivity, and profit can influence DBMI adoption. With the relevant digital technologies, the business can innovate the existing business model effectively and efficiently. The general manager stated that government financial support such as matching grants up to RM5000 support the digital autocount system of the business.

Respondent B: The managing director emphasize the entrepreneurial leader who takes risks and always looking for innovative ways to transform the existing way to do business, determine the future business direction and exploit new opportunities, looking for expert assistance and advice to digitalize further on the existing production line, internal process promote DBMI adoption for the business. Furthermore, the business’s digital capability to incorporate new and advanced digital technologies to improve productivity and efficiency is extremely important to implement DBMI. The managing director highlighted the government’s training in the form of human resources development fund (HRDF) claimable. He asserts that financial support from the government, such as emergency financial assistance during COVID-19 at RM0.5m (2.5% plus BLR rate) from UOB, retaining the employee fund can support the business operation. Due to the pandemic, the funds were used for business sustainability instead of DBMI.

Respondent C: “For my business, entrepreneurial leadership and digital capability are more important than government support in DBMI adoption”. He explained that entrepreneurial leaders who are passionate and willing to take risks and venture into innovative solutions can affect DBMI adoption. The business’s digital

capability to make flexible adjustments on digital machines (with the support from partners) by using modern digital technology definitely can promote DBMI of the business. He has been experienced to get government financial support. However, due to strict terms and conditions, bureaucratic processes, it will be difficult to attain it. He mentioned that due to Covid-19, many SMEs are suffered from losses, and he hopes they can get the government grant and funds. Government financial and non-financial support could be important to other SMEs in Malaysia. Even though this is not a cash-rich company, his perception is better to focus on targeting the right customers to earn higher profit and escalate business performance.

Respondent D: "As a business owner and entrepreneurial leader, I am passionate and always take risks to customize the system and do a trial run, improve it from errors, helping customers to import some sensitive items such as electronic items, which will be difficult for the customer to import it by themselves, this can support DBMI adoption in the business". The business's digital capability to acquire new system/digital technologies is vital in DBMI adoption. Apart from that, government financial support such as 'Penjana' loan from BSN and training can influence DBMI adoption of the business.

Theme 4: Outcome of DBMI (SMEs competitiveness)

Respondent A: "DBMI adoption leads to higher competitiveness, for instance, higher sales; streamline, standardized and efficient business process; forecasting more easily; speedy responses to market changes and opportunities compared to competitors. This resulted in business survival in the long term and expansion strategy in the future".

Respondent B: “Digital technology, automation and digital printer support the business to reduce cost, produce quality products, raise efficiency. However, the adoption of DBMI at the basic level would only contribute to profit at the minimal level.”

Respondent C: “The adoption of DBMI leads to the business becoming more competitive. I will always learn from daily news for market changes, opportunities to stay competitive with the competing organization”.

Respondent D: “DBMI increase business competitiveness, now the business using the shorter time to respond to customer enquiries and orders, speedy delivery and charging lower service fees as compare to competitors”.

In a nutshell, findings from preliminary interviews provide the real-life situation of SMEs. The preliminary interview findings are consistent with the results of prior studies, in which the responding organization agreed that DBMI is at the initial stage in Malaysia. Evidently, they are practicing it but did not label it as DBMI. They have the same consensus that DBMI adoption is contingent on entrepreneurial leadership, digital capability, and adoption of DBMI contribute to SMEs’ competitiveness, even though at a minimal level (respondent B). In terms of government support, excluding respondent B, most respondents (respondents A, C, D) emphasized the importance of government support in DBMI adoption. Although government support for respondent C is perceived as insignificant, respondent C asserts that financial assistance from the government plays a significant role in supporting SMEs to venture into DBMI to achieve business survival during the pandemic.

1.3 Problem Statement

DBMI adoption of SMEs is low and at the embryonic stage in Malaysia (Economic Planning Unit, 2021). During the pandemic of Covid-19, MDEC and the government encouraged SMEs to digitalize their business operations to sustain the business in the digital age (New Straits Times, 2020). Based on the findings from the preliminary interview, DBMI is a fresh term for SMEs. They are still struggling to seek innovative ways to transform the existing business model using more advanced digital technologies to prosper in the digital environment. Organizations are increasingly pressured to employ digital technologies to transform and innovate business models (Kohli & Melville, 2019). DBMI could endanger the existing business model, and organizations are skeptical of the outcome of DBMI; they worry they might fail to exploit future opportunities and thus, keep business activities unchanged (Bouncken et al., 2019).

Based on the findings from 2033 SMEs in Malaysia, even though there are 44% of SMEs adopt an e-commerce business model, they are employing social media platforms for marketing and communication purposes only while still using traditional payment methods such as cash and not integrated online payment gateway (SME Corporation Malaysia & Huawei Technologies (M) Sdn Bhd, 2018). These would lead to poor customer experiences. Indeed, there is 23% of SMEs plan to embrace an e-commerce business model; another 33% of SMEs reluctant to employ an e-commerce business model to expand the business due to their preferences to manage physical sale channels instead of managing both offline and virtual sales processes, which adding workloads to their employees (SME Corporation Malaysia & Huawei Technologies (M) Sdn Bhd, 2018).