ADVANTAGES AND CHALLENGES OF DIGITAL TRANSFORMATION IN MALAYSIAN FOOD AND BEVERAGE SMEs

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UNIVERSITI UTARA MALAYSIA
DECEMBER 2023

THE ADVANTAGES AND CHALLENGES OF DIGITAL TRANSFORMATION IN MALAYSIA FOOD AND BEVERAGE SMEs

By

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Thesis Submitted to
School of Technology Management and Logistics,
Universiti Utara Malaysia,
In Partial Fulfillment of the Requirement for the Master of Science
(Supply Chain Management)

Kolej Perniagaan
(College of Business)
Universiti Utara Malaysia

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Program Pengajian *(Programme of Study)*	:	**Master of Science (Supply Chain Management)**
Nama Penyelia/Penyelia-penyelia *(Name of Supervisor/Supervisors)*	:	**Assoc. Prof. Dr. Mohamad Faizal bin Ahmad Zaidi**
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ABSTRACT

Digital transformation is the process of integrating digital technology into every aspect of a business. It has a profound impact on how those firms run and provide value to their clients. When it comes to the digital transformation of supply chain management, especially food and beverages in Malaysia, some companies are still facing challenges of implementing digitalization in their companies, while others are unaware of the advantages of adopting technology to the companies. This study aims at to examine the potential advantages and challenges of the digital transformation on the food and beverages SMEs in Malaysia. Qualitative research methodology has been used in which two case studies have been selected to study objectives of the study. The study applied the Technology-Organization-Environment (TOE) framework, to provide a holistic understanding of the advantages and challenges of digital transformation faced by the food and beverage SMEs. The analysis was organized in accordance with the TOE framework, consisting of three major themes, namely technology, organization, and environment. In general, the identification of advantages and challenges enabling the food and beverage SMEs in formulating strategies to implement the digital transformation initiatives and overcome the obstacles successfully. The findings have practical implications not only the food and beverage SMEs, but also to the industry associations, policymakers, and digital technology providers.

Keywords: Digital Supply Chain, Digitalization, SMEs, Digital Transformation, Technology

ABSTRAK

Transformasi digital ialah proses menyepadukan teknologi digital ke dalam setiap aspek perniagaan. Ia mempunyai kesan mendalam terhadap cara firma menjalankan dan memberikan nilai kepada pelanggan. Apabila bercakap mengenai transformasi digital dalam pengurusan rantaian bekalan, terutamanya untuk industri makanan dan minuman di Malaysia, sesetengah firma masih menghadapi cabaran untuk melaksanakan pendigitalan dalam perniagaan mereka, manakala yang lain tidak menyedari akan kelebihan menggunakan teknologi digital. Kajian ini bertujuan untuk mengkaji potensi kelebihan dan cabaran transformasi digital terhadap PKS makanan dan minuman di Malaysia. Metodologi kajian kualitatif telah digunakan di mana dua kajian kes telah dipilih untuk mengkaji objektif kajian. Kajian itu menggunakan rangka kerja Teknologi-Organisasi-Persekitaran (TOE), untuk memberikan pemahaman holistik tentang kelebihan dan cabaran transformasi digital yang dihadapi oleh PKS makanan dan minuman. Analisis disusun mengikut kerangka kerja TOE, merangkumi tiga tema utama iaitu teknologi, organisasi, dan persekitaran. Secara umumnya, pengenalpastian kelebihan dan cabaran membolehkan PKS makanan dan minuman merangka strategi untuk membantu melaksanakan inisiatif transformasi digital dan mengatasi halangan dengan lebih berkesan. Dapatan kajian yang diperolehi mempunyai implikasi praktikal bukan sahaja kepada PKS makanan dan minuman, malahan kepada persatuan industri, penggubal dasar, dan penyedia teknologi digital.

Kata kunci: Rantaian Bekalan Digital, Pendigitalan, PKS, Transformasi Digital, Teknologi

ACKNOWLEDGMENT

I would like to express my deepest gratitude to my supervisor, Dr. Mohamad Faizal Bin Ahmad Zaidi, whose invaluable guidance, encouragement, and unwavering support throughout this journey have been instrumental in shaping this thesis. His expertise, patience, and constructive feedback have been invaluable in refining my research and enhancing its quality.

I am also thankful to the faculty members of the School of Technology Management and Logistics for their valuable insights and knowledge shared during the course of my studies. Their teachings and guidance have broadened my understanding of this field and enriched my academic experience.

Furthermore, I extend my appreciation to my family and friends for their understanding, support, and motivation during this academic endeavor. Their encouragement has been a constant source of strength for me.

Last but not least, I am grateful to all the participants and individuals who contributed their time and insights to this research project. Without their cooperation and participation, this study would not have been possible. Thank you all for being a part of this academic journey and for your invaluable contributions.

Sanad Adel Abdo Saeed Saleh

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AI	Artificial Intelligence
COVID-19	The Corona Virus Disease
e-POS	Electronic Point of Sale
ERP	Enterprise Resource Planning
F&B	Food and Beverages
GNI	Gross National Income
MCO	Movement Control Order
MNCs	Multinational Companies
MOF	Ministry of Finance
NSDC	National Skill Development Corporation
SMEs	Small and Medium-sized Enterprises
TOE	Technology- Organization- Environment

CHAPTER ONE
INTRODUCTION

1.1 Background of the Study

According to Verina and Titko (2019), "digital transformation" is the process of integrating digital technology into every aspect of a business, which has a profound impact on how those firms run and provide value to their clients. This covers not only putting new technologies into use but also implementing new business models and procedures. Gil-Gomez et al. (2020) state that the purpose of digital transformation is to boost productivity, improve customer experience, and eventually increase revenue and profitability. The digital transformation process is not without its difficulties, and many businesses find it difficult to properly negotiate this challenging and quickly changing terrain (Zaki, 2019).

When it comes to the digital transformation of supply chain management, Small and medium-sized enterprises (SMEs) may experience particular challenges (Eller, et al., 2020). These companies frequently lack the infrastructure and resources necessary to properly incorporate digital technology. May also have limited budgets. However, it is impossible to disregard the advantages of digital transformation in supply chain management for SMEs (AlMulhim, 2021). SMEs can increase their agility, cut expenses, and compete more effectively with larger firms by adopting digital technology (Del Giudice et al., 2021). This study will examine the opportunities and problems of digital supply chain management for SMEs and offer helpful advice for effective implementation.

Digitalization trends have some impacts on both organisations and individuals (Parviainen et al., 2017). As digitalization has spread, it has become necessary for all

businesses (Bala & Verma, 2018). In its annual report for 2017-2018, SME Corp Malaysia (2018) pointed out the important role that digitalization plays in improving the business landscape by giving businesses the chance to improve development, create more jobs, and speed up innovation (Tham & Atan, 2021). Many digital technologies, such as the Internet of Things, Cloud Computing, Big Data, Mobile, and Social, can help businesses grow and give them new opportunities if make the switch to a digital environment (Sestino, et al., 2020).

Also, the digital transformation had challenges on many levels, such as global supply chain processes, data governance, leadership, and how to integrate organisational transformation technologies (Attaran, 2020). These problems may not have been seen before a few decades ago, and this change has put traditional business models to the test (Khai, et al., 2020). Not only do organisations find it hard to take advantage of the opportunities the digitalization offers, but also fail to change their business models to reflect digitalization's economic features and basic processes (Linde, et at., 2020). With the growth of globalisation and the digital world, it's not clear if the rules from traditional theories are still enough to explain how well an organisation does (Witt, 2019). Amankwah-Amoah, et al. (2021) pointed out that digitalization mostly affects operational processes, which vary in how complicated are and how widelycan be used. Abdulaziz, et al. (2023), emphasized that how some big companies in Malaysia have moved quickly into the digital world, while most SMEs in the manufacturing sector are not ready to use these digital technologies in their business. Also, digitalization has spread to all parts of life and makes new ways to work, talk, and work together (Zakaria, et al., 2021). But standardisation and widespread use of these solutions are not enough to give a firm a long-term competitive edge (Mohammad & Wasiuzzaman, 2021).

According to Tham and Atan, (2021), since 2013, all ministries and agencies, financial institutions, and regulatory agencies that take part in SME development plans have used the definition of SMEs that was approved by the National SME Development Council (NSDC). The 11th Malaysia Plan 2016 says that 98.5% of all businesses in Malaysia are small and medium-sized enterprises (SMEs) (Morshidi, et al., 2021). Most of these businesses are in the Services Sector (89.2%), followed by the Manufacturing Sector (5.3%) and the Construction Sector (4.3%) (Mohamad, Mustapa, & Razak, 2021). The "National E-Commerce Strategic Roadmap" also makes it possible for SMEs to contribute as much as possible to the total GDP, which is expected to reach RM211 billion by 2020 (Tham & Atan, 2021). The roadmap covers things like getting sellers to use e-commerce faster, boosting cross-border e-commerce by promoting national brands, and changing economic incentives that are already in place (Yean & Yi, 2023). The Malaysian government has also started the National Entrepreneurship Policy 2030 (Othman, et al, 2021).

This policy makes rules for the growth of an entrepreneurial community that is inclusive and competitive, especially in the SME sector, and can compete on the global market. It also helps the B40 group and social entrepreneurs grow. In line with the Government's idea of "shared prosperity," the goal of DKN 2030 is to increase the number of skilled, successful, and resilient entrepreneurs and to improve the skills of local entrepreneurs, especially in the SME sector (Johari, et al., 2021). Usahawan, (2019) stated that it supports high growth and innovation-driven enterprises by creating high growth and innovative firms through targeted support in nine pillars of Industry 4.0, such as automation, digitalization, and artificial intelligence (AI).

The food and beverage industry in Malaysia is a significant contributor to the country's economy, with a substantial number of SMEs operating within this sector. As the global landscape of business operations continues to evolve through digital transformation, it is essential for food and beverage SMEs in Malaysia to adapt and embrace digital technologies to stay competitive. However, there is a lack of comprehensive research focusing specifically on the digital transformation advantages and challenges faced by these SMEs. This study aims to fill this research gap by investigating the advantages and challenges associated with digital transformation in food and beverage SMEs in Malaysia.

1.2 Problem Statement

In Budget 2020, the Malaysian government's Ministry of Finance (MOF) put aside RM500 million, according to Kuriakose and Tiew (2022), to help SMEs go digital. The goal of the grant is to get small businesses to use e-POS systems, enterprise resource planning (ERP) solutions, and electronic payroll (Nair, et al., 2021). According to Budget 2020, RM500 million will be given to the first 100,000 SMEs that have applied to upgrade their systems (Hasan, et al., 2021). This money will be given over a period of 5 years. Also, most business in Malaysia is done by SMEs (Tan & Lee, 2022). Because SMEs are so important to economic growth, many things have been done to keep them competitive in the global market (Ulas, 2019). For economic, technological, regulatory, and social challenges, take advantage of new growth opportunities, and make the most of digitalization. To do all of this, there must be transformational changes in the organisation, its culture, its people, and its digital environment in Malaysia (Tay, Alipal, & Lee, 2021).

Based on a report by Flanders Investment & Trade (2020), the Malaysian Food and Beverages (F&B) sector is a rapidly expanding market that significantly contributes to the national account. In 2018, F&B revenues amounted to around €22.12 billion, with an annual growth rate of 7.6 percent. The projected Gross National Income (GNI) for 2019 rose from €286 billion in 2018 to €302 billion, representing an anticipated €8,836.54 GNI per capita at current prices, an increase of €9,255.95 in 2018. This has suggested an increase in the purchasing power of Malaysians, allowing them to acquire relatively more expensive imported goods of higher quality. The evolving lifestyles of Malaysians in recent years have resulted in a surge in the desire for organic and nutritious food. The food and beverage sector is distinguished by a substantial export market, consisting primarily of items derived from palm oil, given Malaysia's status as one of the top two exporters of palm oil globally.

For domestic use, Malaysia is also highly reliant on the importation of numerous staple foods, including rice, beef, seafood, and dairy products. The F&B sector in Malaysia is predominantly controlled by small and medium-sized enterprises (SMEs). Additionally noteworthy are the domestic and international multinational corporations (MNCs) that conduct manufacturing operations in Malaysia. Malaysia is a net importer of food items due to the substantial demand for imported F&B products in terms of local consumption. As a result of the ongoing initiatives of the Malaysian government to open up commerce and give incentives, Malaysian citizens today have access to an extensive selection of domestically manufactured and imported food and beverage items.

The World Bank's June 2021 report indicates that despite numerous government initiatives in the past to promote digital transformation, adoption has been

comparatively sluggish, particularly among small and medium-sized enterprises (SMEs) (Achieng & Malatji, 2022). Merely one-third of Malaysian enterprises have adopted digital technology, and a mere quarter have established a dedicated digital team. Since the first MCO (movement control order), the COVID-19 epidemic has significantly damaged local firms, with at least 100,000 SMEs stopping operations, according to a recent BusinessToday News report (movement control order) (Amirah, 2022). Particularly hard-hit has been the food and beverage (F&B) industry, where many companies have shifted their emphasis from profitability to survival.

Adopting digital transformation in the form of digital tools and platforms would be crucial for enhancing business sustainability and operational efficiency (Zoppelletto, Orlandi, & Rossignoli, 2020). Malaysian F&B SMEs have adapted their operations and adopted internet markets in response to the pandemic (Abhari et al., 2022). This phenomenon is similarly apparent in the regional food and beverage sector, as the analysis suggests that the current limitations may impede an additional 60% of F&B establishments, ultimately resulting in additional closures. In conclusion, it appears that the significance of digital transformation in the Malaysian F&B sector is growing (Chowdhury et al., 2020).

Despite the ongoing uncertainty surrounding the industry's future, many companies have demonstrated resilience and adjusted to the digitalization in Malaysia by diversifying their customer base through digital channels in order to generate additional revenue (Jahari, French, & Ismail, 2022). Trends in digitalization, to some extent, have an equal impact on both organisations and people (Buer, et al., 2021). Today's businesses cannot function without the pervasive use of digitalization (Jones, Hutcheson, & Camba, 2021). SME Corp Malaysia (2018) acknowledged and outlined

the critical role that digitalization plays in enhancing business landscape by providing the opportunity to enhance development, increase employment opportunities, and accelerate innovation in its recently released annual report for the years 2017–2018 (Tham & Atan, 2021).

Numerous digital technologies, including the Internet of Things, cloud computing, big data, mobile, and social media, can accelerate business growth and create new opportunities for organisations that have undergone a transformation to the digital environment (Yuan & Cheah, 2020). Additionally, the digital transformation had created issues with leadership, data governance, global supply chain operations, and how to integrate organisational transformation technologies. These challenges may not have existed decades ago, and this transformation has tested the viability of conventional business models (Bonnet & Westerman, 2020).

Additionally, organizations not only struggle to seize the opportunities offered by digitalization, but also fail to modify their business models to take into account its economic traits and fundamental processes (Alam, Awawdeh, & Muhamad, 2021). The growth of globalization and the digital age make it doubtful that traditional theories' guiding principles are still adequate to explain how well an organization performs. According to Ritter and Pedersen (2020) the main operational processes that are impacted by digitalization vary in terms of complexity and application. The majority of SME in the manufacturing sector are not prepared to integrate these digital technologies into their business practises (Tay, Alipal, & Lee, 2021). Additionally, digitalization has permeated all aspects of life and has given rise to new modes of collaboration, communication, and work (Fussey & Roth, 2020).

The food and beverage industry in Malaysia is characterized by a multitude of SME that play a crucial role in the country's economic growth. As digital transformation continues to reshape industries worldwide, these SMEs face both opportunities and challenges in adopting digital technologies to enhance their business operations. However, there is a need to investigate the specific challenges faced by food and beverage SMEs in Malaysia and the advantages can gain from digital transformation.

Despite the potential benefits, there is limited understanding of the unique challenges that hinder the digital transformation process in this sector. SMEs often face resource constraints, limited digital literacy, and resistance to change, making it difficult to embrace and implement digital technologies effectively. Additionally, there is a lack of comprehensive research focusing specifically on the food and beverage SMEs in Malaysia, highlighting the need for an in-depth investigation (Azmi, 2022).

Moreover, while digital transformation has the potential to revolutionize the food and beverage industry, it is essential to identify and analyze the advantages that SMEs can gain from adopting digital technologies. These advantages include improved operational efficiency, enhanced customer experience, expanded market reach, optimized supply chain management, and data-driven decision-making. Understanding and highlighting these advantages will provide insights into the potential benefits that food and beverage SMEs in Malaysia can leverage through digital transformation.

It is necessary to deepen in reviewing information from business actors regarding constraints and challenges in aspects of production, marketing, and human resources to carry out digital transformation so that a more comprehensive discussion can be obtained (Mangifera & Mawardi, 2022).

Therefore, this research necessitates an investigation into the challenges faced by food and beverage SMEs in Malaysia during the digital transformation process and the advantages the firm can gain from embracing digital technologies. Addressing these gaps will contribute to filling the knowledge void and provide practical recommendations and insights to support SMEs in overcoming barriers and maximizing the benefits of digital transformation in the food and beverage industry in Malaysia.

1.3 Research Questions

In order to accomplish the study's objectives, this research examines the benefits and difficulties associated with digital transformation in Malaysian food and beverage SME sectors. The research was centred on small and medium-sized enterprises (SMEs) operating in the food and beverages (F&B) sector in Kedah, a northern region of Malysia. Based on the problem statement above this study's main goal is to investigate the possible advantages and challenges of digital transformation in Malaysia SMEs. The study specifically seeks the following research questions:

a) How does digital transformation bring advantages to the food and beverages SMEs in Malaysia?
b) How does digital transformation bring challenges to the food and beverages SMEs in Malaysia?

1.4 Research Objectives

The following research questions serve as the study's compass:

a) To explore the potential advantages of digital transformation in the food and beverages SMEs in Malaysia.

b) To explore the potential challenges of digital transformation in the food and beverages SMEs in Malaysia.

1.5 Significance of the Study

This study holds several key implications and significance. Firstly, it provides a comprehensive understanding of the specific challenges that food and beverage SMEs encounter during the digital transformation process. Identifying these challenges enable stakeholders, such as policymakers, industry associations, and technology providers, to develop targeted support programs and initiatives to assist SMEs in overcoming these obstacles. Secondly, by examining the advantages that SMEs can gain from digital transformation, this study contributes to a better understanding of the potential benefits and encourage SMEs to embark on their digitalization journey. Lastly, the findings of this study contribute to the existing body of knowledge on digital transformation in the food and beverage industry, specifically focusing on the Malaysian context.

1.5.1 Theoretical Significance

The study adopts a theoretical framework based on relevant theories and concepts in the field of digital transformation and SMEs. The theoretical underpinning draw upon the Technology-Organization-Environment (TOE) framework, to provide a holistic understanding of the advantages and challenges of digital transformation for food and beverage SMEs. The TOE framework provides a comprehensive lens for understanding the factors that influence the adoption and implementation of digital technologies in organizations. By applying the TOE framework, the study can systematically investigate how these factors interact and influence the advantages and challenges of digital transformation in food and beverage SMEs in Malaysia. It provides a structured approach to analyse the technological, organizational, and environmental dimensions,

helping to identify the specific barriers and enablers of digital transformation within the industry. The findings from this framework can guide strategies and recommendations to address the challenges and leverage the advantages of digitalization in food and beverage SMEs.

1.5.2 Methodological Significance

The methodological significance of this study lies in the utilization of qualitative research methods, such as interviews, to gather rich and detailed data from food and beverage SMEs informants. Qualitative methods enable the exploration of the experiences, perspectives, and insights of individuals directly involved in the digital transformation process. This approach allows for an in-depth examination of the challenges faced by SMEs, the advantages the firm gain from digital transformation, and the contextual factors influencing these outcomes. The use of qualitative methods enhances the validity and reliability of the study's findings and provides a holistic understanding of the research phenomenon.

1.5.3 Practical Significance

The findings of this study will have practical implications for food and beverage SMEs, industry associations, policymakers, and technology providers. The identification of challenges will guide SMEs in formulating strategies to overcome obstacles and successfully implement digital transformation initiatives. Industry associations can develop support programs and provide guidance tailored to the unique challenges faced by SMEs. Policymakers can utilize the study's findings to design policies and initiatives that foster an enabling environment for digital transformation. Technology providers can gain insights into the specific needs and requirements of food and beverage SMEs, enabling them to develop customized solutions and services.

1.6 Scope of the Study

This study focus specifically on food and beverage SMEs in Malaysia. The research covers a range of sub-sectors within the food and beverage industry, including restaurants, cafes, food manufacturing, and catering services. The geographical scope is the Northern Region of Malaysia, with a focus on the state of Kedah. The study explores the advantages and challenges related to digital transformation, including aspects such as e-commerce platforms, mobile applications, digital marketing, inventory management systems, and customer relationship management. This study does not delve into the financial implications or provide a comparative analysis between different countries or industries.

1.7 Definition of Key Terms

Table 1.1 shows the definition of key terms referred to by this study.

Table 1.1: Definition of Key Terms

Term	Definition	Source
Advantages	The benefits, opportunities, or advantages that food and beverage SMEs can gain from embracing digital transformation. This can include improved operational efficiency, enhanced customer experience, increased market reach, optimized supply chain management, data-driven decision-making, cost savings, and increased competitiveness.	Mangifera and Mawardi (2022)
Challenges	The obstacles, barriers, or difficulties faced by food and beverage SMEs in their digital transformation journey. These challenges can include resource constraints, limited digital literacy, resistance to change, financial limitations, lack of infrastructure, and technological complexities.	Oduro (2020)
Digital Transformation	The process of adopting and integrating digital technologies, tools, and strategies to fundamentally transform business operations,	Martínez-Caro,Cegarra-Navarro, &

	processes, and models in order to enhance efficiency, innovation, and competitiveness	Alfonso-Ruiz, (2020)
F&B	Small and medium-sized enterprises operating in the food and beverage industry. These are typically businesses involved in food production, processing, distribution, catering, and/or retailing, with a relatively smaller scale compared to larger corporations.	Davis et al. (2018)
SMEs	Is the micro scale; less than 50 employee, small scale; 50 employees, medium scale; 50-200 employees.	Bauchet and Morduch (2013)
TOE Framework	Is an organization-level theory that explains that three different elements of a firm's context influence adoption decisions. These three - elements are the *technological context*, the *organizational context*, and the *environmental context*. All three are posited to influence *technological innovation*.	Baker (2012)

1.8 The Organisation of the Study

The present study is based on five chapters. The first chapter provides background of the study, highlights problem in the problem statement section, provides significance and scope of the study. At the end definitions of key terms are provided. The second chapter includes literature review conducted on digitalization in supply chain management and theoretical framework. Chapter three provides details about methodology; qualitative research methodology had been taken to conduct interviews with the participants in order to get their experiences and opinion about advantages and challenges of the adopting technology in supply chain management in Malysia. Chapter four discusses key themes which emerged from the data from the interviews. At the end chapter fives discussed the conclusion, recommendation, limitation, and directions for future studies.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

This chapter provides a comprehensive review of literature on the digital transformation elements of supply chain management that influence supply chain performance. The chapter also references recent research regarding the significance of supply chain technology internalisation, E-procurement, and supply chain integration due to digital transformation. This chapter's objective is to provide a comprehensive understanding of the most recent findings concerning the significance of digital transformation in enhancing the supply chain performance of a firm.

2.2 Digital Transformation

There have been big changes in almost every industry because of new technologies like the internet, big data, and mobile devices. Because of this, businesses need to be aware of how this is affecting nearby industries and act accordingly. Organizations must adopt digital transformation in order to stay competitive and relevant in today's digital market; failing to do so would lead to their demise (Andersson, et al., 2018). The move to digital has become an interesting trend for strategic IS professionals and researchers in recent years (Vial, 2019). Scholars have come up with different ways to describe digital transformation (Westerman, et al., 2011). Vial says that digital transformation is when digital technologies are used to make an organisation better at what it does (2019). Gurbaxani and Dunkle (2019), on the other hand, said that digital transformation is a planned way to use new digital technologies to help the investing organisation make things better for customers, run more smoothly, or come up with new ways to make money. Martínez-Caro et al. (2020) also talk about how digital technologies can change

organisations, which could mean making changes to system processes, products, or the way organisations are set up. Different researchers have given different explanations of what "digital transformation" means, but one thing they all have in common is that it means changing the way work is done by using new digital technologies or improving old technologies to make the organisation more efficient (Attaran, 2020).

Even though many businesses write down great digital transformation plans, there is a huge gap between having a logically sound digital plan in writing and putting it into action. A lot of digital transformation projects fail because the strategies aren't put into action well (Correani, et al., 2020).

Digital transformation is more than just small improvements made by an organisation; it's an ongoing process that comes with a carefully thought-out plan to reach specific goals. Harmonizing the business strategy with the IT strategy is an important part of a well-thought-out plan for digital transformation (Bharadwaj, Sawy, & Venkatraman, 2013). Sometimes, companies fail to achieve their digital transformation goals, not because they did not come up with a good strategy, but because they did not have a good plan for putting it into action. Researchers have come up with four important things for businesses to think about in order to help them reach their goals (Correani et al., 2020). The first thing the investigating organisation needs to do is get the customers involved. To make predictions about the future, they need to look at and analyse data about how customers behave. This will improve the customer experience, which is good news for the effort to have a successful digital transformation. The second thing they should do is give their employees the tools they need to succeed in the new digital job market, which comes with all the changes that come with it. To make their system work better, they should also push for the

automation of business processes across all of their different departments. Lastly, they should start making changes to their services, products, or business plans.

For the digital transformation of organisation to do well, they need to improve both of their digital and leadership skills (Schiuma, et al., 2022). This will help the firm to figure out the skills they need to improve and how to do it. The matrix has four levels of digital mastery: fashionistas, novices, conservatives, and digital masters (Weerasinghe & Nirere, 2022).

Because of the Fashionistas case study, companies that put more emphasis on developing digital skills than leadership skills should help their leaders get better at what they do. Giving managers the skills and abilities, they need is one way for an organisation to give them power. The manager should be able to get everyone excited about the upcoming changes to the organisation that will happen because of their active participation in the digital transformation process. To deal with the problems that come with going digital, Westerman et al. (2014) gave us three ideas to think about, which we will go into more detail below: setting up new behaviours, earning the right to take part, and sending signals. Signalling: Leaders must give clear information about the digital transformation at this point in the process of getting the organisation to work together.

They should explain what a digital transformation is, stress how important it is to be a part of it and list the resources that are needed to make it happen. At the end of this phase, at least every employee should know about the digital transformation and what it means for the firm and the individual. Getting permission to do something: This is the next step after the information about digital transformation is shared. During this phase, the leaders of the organisation set an example for the rest of the staff. They need

to work together with accountable staff to come up with new behaviours that match the new vision and a plan for putting the digital transformation vision into action.

Also, they should find the employees who understand the digital transformation vision the best and make them "digital champions" to help get other employees on board. Lastly, leaders should show both inside and outside the firm how quickly business will improve because of digital transformation. Changes in behaviour: This idea shows how employees must change how they act to fit into a new organisational culture created by new technologies when companies go digital (Neeley & Leonardi, 2022).

Along with that, organisations that embrace digital transformation have chances to deal with the new problems that come up in today's digital world (Casalino, et al., 2019). This not only gives businesses a way to become more competitive, but it also gives them problems to solve. As a result, leaders of organisations need to be aware of the different problems that come with going digital. Problems that come up when different industries go digital have been the subject of research. It was the goal of the study by Alhubaishy and Aljuhani (2021) to find out what problems students and teachers in Saudi universities were having with the digital transformation. The results showed that the most common problems students had were not having enough resources, not wanting to change, and having trouble learning.

Instructors, on the other hand, were mostly held back by a lack of experience and worries about data security. Also, Al-Ohali et al (2019) study of the human aspect of digital transformation in the education sector showed that both teachers and students have the most trouble when they cannot figure out how to use new technologies properly. Senior and Swailes (2016) found that owners face problems when they trying

to go digital with the businesses. These problems include worries about data security, not having enough control, and IT systems that do not work with the new ones.

According to Cichosz, Wallenburg, and Knemeyer (2020), logistics service providers are having trouble going digital because they do not want to change, they do not have enough resources (like skilled workers), they find it hard to use new technologies, and they are worried about data protection and security breaches. The mining industry said that the biggest problems with digital transformation are limited technology, unclear goals (where current skills do not match the needs of digital transformation), and outside restrictions (Gao, Hakanen, Toytari, & Rajala, 2019). According to Chen et al. (2021), three main problems keep small service-oriented businesses from going digital: not enough money, not enough people to work there, and technical problems (Zhen et al., 2021).

Shahi and Sinha (2021) named the main problems that traditional organisations face as not having enough foresight, an organisational culture that makes it hard to learn new skills, bad infrastructure, limited funds, problems integrating systems across different functions of the organisation, and worries about data security. Moeuf et al. (2020) said that the two biggest problems that SME digital transformation projects face are a lack of resources and lack of knowledge. Hai, Van, and Thi (2021) looked at the problems that leaders face during the process of digital transformation and came to the conclusion that leaders do not have the right skills to adapt to a new digital environment.

Maksimenko, Vashko, and Zdrestova-Zakharenkova (2021) say that strategic management systems face problems when they try to implement digital transformation. These problems include not having enough digital skills, not having a digital culture,

not integrating systems well enough, not having enough money, and making the implementation hard.

It is necessary to look at organisational change concepts in order to look into the challenges of digital transformation, since the two go hand in hand. Understanding the culture of an organisation can also help they figure out why some groups do not want to change. We learned that an organization's culture can sometimes be open to change or resistant to it by looking at the argument that Senior and Swailes (2016) made about the connection between organisational change and culture. It is possible for the digital transformation to fail if the organization's culture stops being open to change. As long as an organisation has leaders, those leaders must always have the knowledge and skills to deal with cultural issues that may come up during a digital transformation.

Sambamurthy and Zmud (2017) explained what organisational change is all about by drawing a parallel between how quickly digital technologies change and how quickly people change how they act and think. They found that it is easier for an organisation to change digital technologies than it is to change people's minds. He showed what might happen if employees do not want to use the new digital environment. They do not have the skills to finish the tasks they have been given, which means the project fails if these tasks depend on others in the same project.

The lack of awareness is another important thing to think about when looking at the problems that come with going digital. In their book "Guiding the Digital Transformation," Sambamurthy and Zmud described knowledge as a shared understanding and argued that combining it with information is necessary for digitalization to go well. This happens most often in businesses across all fields where organisational knowledge is not stored digitally as a resource but is instead kept in

people's minds. Unfortunately, things get even worse when the person who knows everything about the organisation isn't there and no one else can do their job. It is suggested that knowledge be organised and checked by knowledge experts in order for it to become an asset for an organisation (Sambamurthy & Zmud, 2017). This would make it possible to get information whenever it's needed in the future.

A lack of resources, including human capital, is another common problem that almost all organisations face. It's a challenge for all organisations to replace old systems with new digital ones in order to meet the needs of digital transformation (Hai, Van, & Tuyet, 2021). Resources include buying new technology gadgets to replace old ones, learning how to work in a digital environment, or spending money on new software. Concerning the skills resource, Sambamurthy and Zmud (2017) went into more detail about how important skills are during the digital transformation process and what happens when people do not have enough of them. They used an example to show how a project manager who isn't doing their job can make it hard for companies to keep their digital investment promises. If the project manager made a mistake when giving tasks to different people, that person may not finish their work if their tasks are connected to those of other team members working on the same project.

Also, Westerman et al. (2014) talked about how a lack of skills in an organisation can cause disagreements among its employees (those who are habitual with using digital tools with those who are not). It is smart to think about intangible assets like skills when planning an investment in digital transformation. This will help the firm avoid the disaster of not getting the results they were hoping for from the digital transformation. Problems with digital transformation need to be fixed so that the

expected benefits of digital transformation can happen. To handle this, they need to be able to do both digital and leadership things (Westerman et al., 2014).

2.3 Digital Transformation in SMEs

The way that businesses, individuals, and groups operate, communicate, and generate value through IT is all altered by digital transformation. In these kinds of situations, people represent this change in order to build a mental model that helps them understand the world. However, a person's ideas are not formed in a vacuum; rather, they are derived from shared perceptions of objects (González-Varona et al., 2021). Thus, the often-overlooked social component of sensemaking, the social dimension of the digital transformation process is made visible (Weick, 1995). In doing so, it has been stated that, given the challenges of the digital age, it is necessary to connect complementary forces in order to support entrepreneurship and small and medium-sized enterprises SMEs (Roundy & Fayard, 2019). This is due to a number of factors.

Digital transformation in SMEs aims to tackle three types of inertia: psychological (individual entrepreneurs), sociotechnical (group IT professionals), and economic and political (systemic) (socioeconomic support professionals). Second, the unique and developing IT requirements lead to a greater interdependence of different and frequent new relationships amongst cooperating actors. Third, there is a good chance that vital technological assets or resources for the business and its operations are located outside of organisational borders. This is particularly true for resources needed for services and innovation input. Fourth, each actor must establish their own boundaries of action, including the circumstances in which exchanges and activities take place (Bin & Hui, 2021; Pelletier & Cloutier, 2019).

Additionally, academics and practitioners are very interested in and current affairs regarding the topic of digital transformation in SMEs. Innovation and production processes are changing as a result of the growing application of advanced DT. Its implementation necessitates the ability to lead technological innovations in the socio-technical environment and adapt the business model to new technologies, despite its technological profile (Frank et al., 2019; Muller et al., 2018).

Moreover, experts claim that in an era of relentless technological advancement and digital revolution, SMEs need research to help them maintain their economic relevance. Regarding SMEs, digital transformation pertains to the digitization of the entire organisation and its business procedures (Tarutė et al., 2018). Additionally, the digital transformation process necessitates a creative cultural approach capable of supporting both the intricate path towards the digital configuration in the present and the future, as well as the drastic transformation of the organisational settings of the companies (Garzoni et al., 2020). Furthermore, modern sales channels are often unknown to SMEs, but the firm are especially intriguing because they have the potential to expand their market reach. The traditional sales model in the digital age is shifting from a counter to a product line on online marketplaces. For SMEs to be able to keep selling goods globally, they must use web stores or participate in big platforms (Stich et al., 2020).

The extent of the digital transformation, which goes beyond just implementing digital technologies, has completely surprised SMEs. Organisational and cultural factors are frequently overlooked. SMEs compete globally with other businesses that are rapidly advancing into the digital era (Zhang, Xu & Ma, 2022). By focusing on niche markets, SMEs can still hold a strong position in the market. This position cannot

be sustained in the future due to the emergence of digital business models and platforms (Tarutė et al., 2018). It is necessary for SMEs to approach the internal digital transformation from a holistic perspective. This involves taking actions that go well beyond technical details. The resources available to plan and carry out digitization projects are particularly limited for medium-sized businesses. The firm frequently lack the required knowledge and experience in addition to time and financial resources (Bin & Hui, 2021).

2.4 Digital Transformation in Food and Beverages

In the last few decades of the 20th century, businesses, universities, national governments, and public and nongovernmental organisations paid more and more attention to the idea of sustainable development (Salim & Padfield, 2017). It is very hard to achieve sustainable development in developing countries like Malaysia. This makes the conflict between protecting ecological and environmental assets and promoting economic growth stand out even more. There are some problems that need to be fixed in the local industry for it to stay competitive and keep its huge potential for agricultural products. The authors of Salim et al. (2018) say that the production and consumption of food are major causes of global environmental degradation. Still, there haven't been many comprehensive efforts to find the possible problems, solutions, and drivers that will help people get past the problems (Boiral al., 2017). The food case is relevant when growing food puts a lot of stress on ecosystems around the world and in local areas.

As expected, between 2015 and 2020, food sales in Malaysia grew by more than 7% per year. This is similar to how the food and drink industry in Malaysia is changing, with a greater focus on health and convenience trends. People who care about healthy

eating and living have created a demand for natural and organic foods, as well as fresh and functional foods that are processed as little as possible. Recently, people have changed their shopping habits from buying basic things like rice and fish to buying more expensive imported goods like wine, dairy, meat, organic foods, and sweets (Euromonitor, 2015).

Also, the food retail industry is always changing because more and more people are switching from buying goods at wet markets to getting them delivered to their homes from supermarkets. Malaysia's diverse population, which includes Malay, Chinese, and Indian people as well as a large number of western and expatriate communities, makes the country's food scene stand out. This led to more people wanting fresh and processed foods, drinks, and products that are halal-friendly. Given that 60% of Malaysia's population is Muslim, the country is known as a hub for re-exporting halal food to nearby Muslim countries (Euromonitor, 2015). The global halal food industry is thought to be worth about US$700 billion right now. But most of the countries that Malaysia sells F&B to, like the US, China, Indonesia, Singapore, and Thailand, are not concerned with the environment (MIDA, 2013). Because of this, the F&B may be very motivated to expand its market reach in European countries and countries like Japan that already have strong environmental laws, rules, and guidelines (NRE, 2014).

In 2019, the food and drink industries in Malaysia brought in a total of $268 million. A compound annual growth rate of 18.0 percent is expected for the sales from 2019 to 2023. This will bring the market volume to $520 million by that year. Also, 19.5% of people used it in 2019, and that number is expected to rise to 22.6% by 2023. One user brings in an average of $42.28 million a month, which is called ARPU. China

brought in the most money ($21,945,000,000,000) around the world in 2019. The food and beverage industry is expected to bring in 28.8 percent more money in 2020. (Statista, 2019). It is expected that the food and beverage industry will have 7.7 million users by 2023, up from 19.5% of the total user base in 2019. The ARPU for the food and drink segment in 2019 is $42.28 million. In the same way, 39.8 percent of users in 2017 are in the high-income group. In 2017, 50.6% of all users were men. The information shown in the records comes only from the answers people gave in a survey about their income.

The Statista Global Consumer Survey is where the data came from. With a market volume of US$21.945 million in 2019, China led the food and beverage sector in terms of revenue. However, the UK has the highest user penetration rate in the industry, at 56.8 percent. From this information, it looks like Malaysia can compete with both developed and developing countries. Because of this, it is helpful to look into changes in the food and drink industry.

Most of the waste and natural resources used in the manufacturing sector come from making things (International Energy Agency, 2007). In particular, it caused a 61% rise in energy use and a 36% rise in CO2 emissions around the world from 1972 to 2004. (OECD, 2014). The NWRS Peninsular Malaysia says that the need for water will rise by 63% from 2000 to 2050. Gross domestic product (GDP) grew by 27.2% in Malaysia in 2012 and by 6.4% in 2014. In 2015 and 2016, the manufacturing sector grew by 5.5% and 4.2%, respectively, thanks to strong export-oriented and domestic industries. For more information, the Malaysian Industrial Policy Studies say that value added increased by 4.5% in 2017. This is the biggest part of Malaysia's economy and provides 28.9% of all jobs (Bank Negara Malaysia, 2011).

Several big problems exist in Malaysia's FBC sector that the industry has to deal with. Some of these are a bad business environment, more toxic waste, bad infrastructure, low disposable income, fewer chances for growth and development, products that aren't available for long periods of time, a lack of ability to innovate, and poor long-term performance. Because of this, the performance situation in Malaysia's agro-allied industries is about to face big problems. The current situation in Malaysia is likely to change because of the prime minister's bold promise to lessen the country's environmental impact (Manzo & Padfield, 2016).

2.5 Underpinning Theory

The Technology Organization Environment Framework serves as a comprehensive model that examines the intricate interplay between technology, organizational structure, and the broader environmental factors that shape an entity's operations. In today's rapidly evolving landscape, where technology is a driving force of innovation and transformation, understanding the dynamics within this framework has become pivotal for businesses and institutions seeking to remain competitive and adaptive. By delving into the complex relationships among technology, organizational strategies, and external influences, this framework provides a structured lens through which we can analyze how technological decisions are made, implemented, and ultimately impact an organization's overall success. In this context, we explore the multifaceted dimensions that contribute to the synergy—or potential conflicts—between technology, organization, and the environment in which the firm operate.

In The Processes of Technological Innovation authors Tornatzky and Fleischer (1990), lay out the TOE framework. The book covers the full spectrum of creativity, from ideation through commercialization by engineers and businesspeople to the

acceptance and application of those innovations by customers inside an organisation. One part of this procedure is exemplified by the TOE framework, which examines how factors external to the firm affect the success of innovation implementation. The TOE framework is a theory at the organisational level that describes how these three factors in a firm's environment have a role in shaping adoption choices. The technological, organisational, and environmental settings all play a role. These three factors are thought to affect technological progress.

Existing studies have shown that the TOE model may be used to a variety of technological, industrial, and national/cultural settings and provides useful explanations in each. Electronic data interchange (EDI) (Kuan & Chau 2001), open systems (Chau & Tam 1997), enterprise systems (Ramdani et al. 2009), and a wide range of general IS applications (Thong 1999) are just a few examples of how the TOE model has been applied to explain their widespread uptake.

Manufacturing (Mishra, 2016; Zhu et al. 2006), healthcare (Lee & Shim 2007), retail, wholesale, and financial services are just few of the industries that have used the TOE model to describe the diffusion of new ideas. Zhu, Xu, and Dedrick, (2003), Zhu and Kraemer (2005), and Zhu et al. (2006, 2004) reported that the TOE model has been successfully implemented in a variety of settings across Europe, the United States, and Asia. Technology, organisational structure, and external factors have all been demonstrated to affect a firm's propensity to recognise the need for, pursue, and implement technological change. The (TOE) Framework sheds light on the benefits and drawbacks of digital transformation for small and medium-sized food and beverage businesses in Malaysia.

This framework helps policymakers and industry stakeholders find crucial areas for intervention and assistance by analysing the interplay between technological factors, organisational factors, and environmental variables. The TOE Framework can SMEs successfully traverse the digital transformation journey and reap the benefits of digital technology to increase their competitiveness and sustainability in the dynamic business landscape. Please refer to Figure 2.1 for the TOE framework.

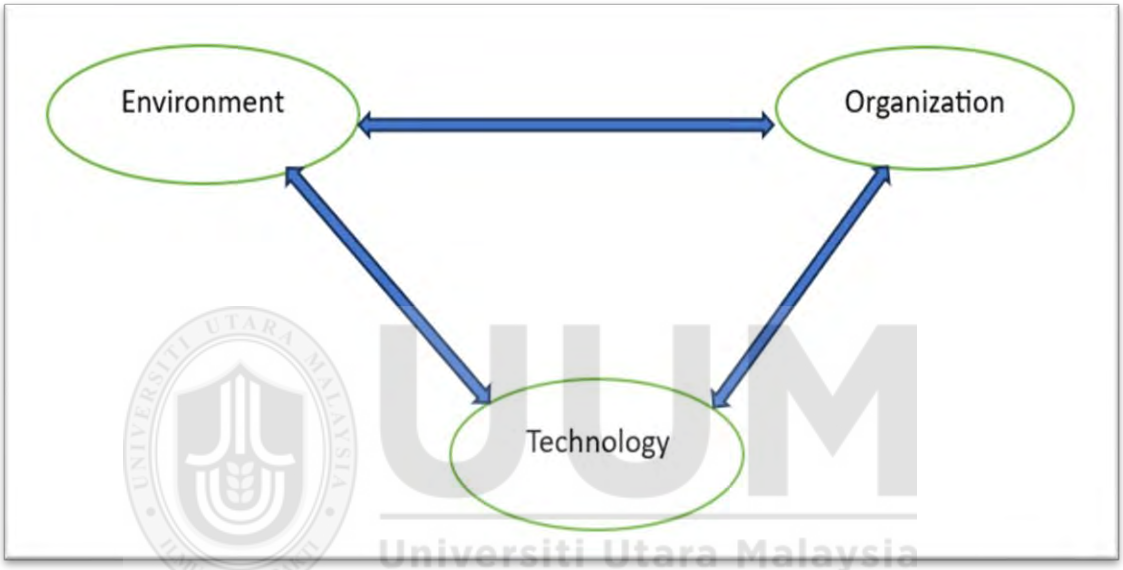

Figure 2.1: TOE Framework (Source: Baker (2012))

2.6 Conceptual Framework

The current study intends to identify advantages and challenges of adopting digital transformation in food and beverages SMEs in Malaysia. Based on the theoretical understanding of the TOE framework, the study's conceptual framework is based on three key areas which are technology, organization and environment. The main objective of the study is to identify advantages and challenges, therefore, the study has

used two case studies to figure out advantages and challenges of adopting digital transformation in terms of technology, organization, and environment. Refer to Figure 2.2 for the proposed conceptual framework based on the TOE framework.

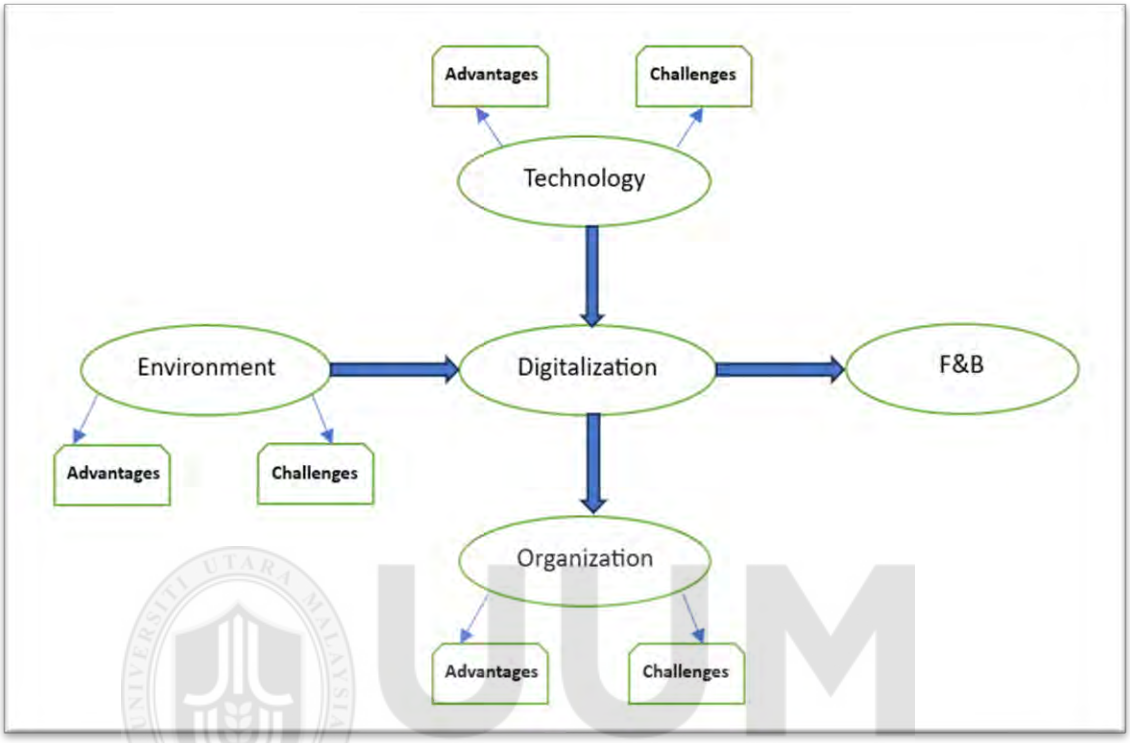

Figure 2.2: Conceptual Framework

2.6.1 Advantages and Challenges from Technological Context

The technological framework encompasses all applicable technologies, such as those now employed by the firm and others that are commercially accessible but have yet to be adopted. The technologies already in place within a firm are significant in the adoption process because they determine the extent to which and the rate at which technological change may be implemented inside that firm (Collins, Hage, & Hull, 2018). Existing innovations that aren't being used by the firm have an impact on innovation, too, by setting boundaries for what's feasible and demonstrating to businesses how technology may help them change and adapt.

Tushman and Nadler (1986) distinguish between three sorts of innovations that exist outside the firm: innovations that produce incremental, synthetic, or discontinuous changes. Incremental innovations improve upon current technologies by adding new features to them or releasing updated models of such technologies. Minimal risk and disruption are involved in adopting such modest advancements. Examples include the shift from cathode ray tube (CRT) to liquid crystal display (LCD) computer monitors and upgrades from older to newer versions of enterprise resource planning (ERP) software. Synthetic innovations, in which preexisting ideas or technology are merged in a creative way, constitute a middle ground of moderate change. Online course materials provided by educational institutions are one such instance. Neither the methods of instruction nor the material covered are particularly cutting-edge or novel. So, to innovate, we integrate old technologies in new ways.

2.6.2 Advantages and Challenges from Organizational Context

Organisational resources and characteristics include things like internal communication channels, the scale of the firm, and the availability of spare manpower. Decisions on adoption and implementation are influenced by this setting in a number of ways. Galbraith (1973) and Tushman and Nadler (1986) argue that innovation thrives when internal subunits are linked or when borders within an organisation are crossed. Adoption is linked to the presence of informal linking agents such product champions, boundary spanners, and gatekeepers. Other examples of such systems include cross-functional teams and individuals who have connections to other departments or partners in the value chain, either formally or informally.

Researchers have looked into the link between firm structure and the rate at which new ideas are adopted. Adoption is connected to organic and decentralised

organisational structures (Burns & Stalker 1962; Daft & Becker 1978). Teams are emphasised, roles are flexible, and both vertical and horizontal lines of communication are encouraged in flat organisational structures. Mechanistic (rather than organic) structures, with their emphasis on formal reporting relationships, centralised decision-making, and clearly defined roles for employees, may be best suited to the implementation phase of the innovation process, according to other research on organisational structure (Zaltman, Duncan, & Holbeck, 1973).

2.6.3 Advantages and Challenges from Environmental Context

Industry structure, availability of technological service providers, and government regulation are all elements of the larger environmental setting. Several approaches have been taken to study the structure of industries. For instance, Mansfield (1968) and Mansfield et al. (1977) find that high levels of competition encourage the use of new ideas. Another way that leading companies can spur innovation among their suppliers is by setting an example themselves (Kamath & Liker, 1994).

It has been stated that, in terms of the industry life cycle, businesses operating in expanding markets are more likely to innovate frequently. However, innovative practises are less straight and dry in established or waning businesses (Tornatzky & Fleischer, 1990). In response to a declining market, some companies implement new efficiency measures or branch out into other fields. Some businesses may choose not to invest in innovation as a cost-cutting measure. There is still a need for empirical research to confirm these hypotheses about the life cycle of industries and the rate of innovation uptake.

Technology innovation is also affected by the framework in which it is deployed. Companies that have to pay more for competent workers are typically pushed to

innovate in order to cut costs elsewhere (Globerman 1975; Levin et al. 1987). There is an increase in creativity when both trained workers and consultants/other suppliers of technological services are readily available (Rees et al 1984).

2.7 Summary

Sustainable development through digitalization is a growing concern for industries, universities, and governments in developing countries like Malaysia. The food and beverage sector in Malaysia has experienced a 7% annual growth between 2015 and 2020, driven by convenience trends and health concerns. Consumers are increasingly seeking natural and organic foods, with a shift towards imported items. The food retail sector is experiencing continuous transformation, with Malaysia's multi-cultural population attracting high demand for processed and fresh food, halal-friendly products, and beverages. Malaysia's halal food industry is estimated at US$700bn, but most export destinations are not eco-sensitive countries. The also included theoretical framework in which TOE Framework has been utilized to explain the phenomenon at study.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction

Qualitative research can use a number of different research methods. One such method is the case study. Some people have said that case studies are not quite as rigorous as quantitative research that uses statistical methods (Ellram, 1996) that are not as hard hitting. Still, a lot of scholars say that both qualitative and quantitative approaches are necessary to make sure that scholarly inquiry covers a wide range of topics. The goals of qualitative and quantitative research may be different. For example, the goal of case research is not to come up with statistically generalizable results. However, if the results help us understand the existing theory better or more fully, the firm will be useful for analysis (Yin, 2003).

Miles and Huberman say that some of the best things about qualitative research are its flexibility, richness, ability to find meanings, holistic assessment of causes, and natural setting (1994). McCutcheon and Meredith (1993) say that case studies are very useful for looking at examples from the "real world." Also, Ellram (1996) says that case studies are great because they give detailed explanations of "best practises." Seuring (2008) says that case studies are great for looking at different parts of a supply chain because they let them see things directly from the field. Case studies have been found to be useful and useful by many authors, including Seuring (2008), in their research in the areas of purchasing and supply management, operations management, supply chain management, and logistics.

The case method is the best way to look at business networks, according to Jarvensivu and Tornroos (2010) and Halinen and Tornroos (2005). However, Voss, Tsikriktsis, and Frohlich (2002) say that case research has consistently shown to be one of the most useful research methods in operations management. According to Ellram (1996), the utilisation of case study research methodology presents significant prospects across various domains of logistics and purchasing. Please refer to Figure 3.1 for the research design of this study.

Figure 3.1: The Research Process for Case Studies (Source: Kahkonen (2014))

3.2 Research Questions

Based on the research questions, the methodology and data collection method should be chosen (Stuart et al., 2002). According to Yin (2003), coming up with research

questions is one of the most important first steps in the research process. The purposes and aims of a study are made clear through research inquiries. The researcher needs to know both the substance (what the study is about) and the form (what kind of question is being asked, like "who," "what," "where," "why," or "how") (Yin, 2003). Koulikoff-Souviron and Harrison (2005) say that the research scope can affect the levels of analysis used when asking questions. For example, when studying supply chains, the research scope can affect the levels of analysis used.

It was suggested by Voss, Tsikriktsis, and Frohlich (2002) that research questions and constructs can change, grow, or be thrown out over time. Another possible strength is that this makes it easier to learn more than if the questions were set in stone. Because "how" and "why" questions are meant to explain, case studies are often used to answer them (Yin, 2003). Yin (2003) says that a case study is an empirical investigation that looks at a current phenomenon in its real setting, where it is hard to tell the difference between the phenomenon and its context and uses a lot of different types of evidence. The different parts of the case are seen as a whole, rather than as separate variables (Dubois & Araujo, 2007).

Eisenhardt (1989) says that a case study is a way to do research that focuses on understanding how things work in certain situations. Case studies are a way to look at modern events that are hard to separate from their surroundings. To understand how things work in a certain setting, the firm need to be studied in that setting (Halinen & Tornroos, 2005). In addition, interviews were used along with case studies to allow for more in-depth discussions about the reasons and methods behind the questions, as well as the underlying causes and context of the problems at hand. This supports the methodological approach chosen in a number of studies even more. With case design,

a lot of empirical data about the thing they are studying can be gathered, which will help to understand it much better.

Case study can be descriptive, explanatory, or exploratory in your case studies (Yin, 2003). The goal of an exploratory case study is to find out if a certain research method is possible or to come up with questions and hypotheses for further research. According to the definition, a descriptive case study gives a full picture of the phenomenon in its own right, while an explanatory case study uses information from cause-and-effect relationships to explain how things happen (Seuring, 2008). Based on the current research, a descriptive case study would be a good way to look at the pros and cons of going digital in Small and Medium-sized Enterprises (SMEs) food and drink businesses.

The goal of a descriptive case study is to give a thorough account of the features of a certain event or situation. The thing that is being looked at is how Malaysian small and medium-sized food and drink businesses are going digital. With the help of descriptive case studies, researchers could find out how far along these small businesses are in their digital transformation, what problems they are facing, and what benefits they have gained from going digital. This kind of research would help us figure out what factors affect the outcomes of digital transformation projects carried out by small food and drink businesses in Malaysia.

Primary data is collected by means of conducting interviews with the CEOs/founders of two companies. In order to provide guidance for the semi-structured interview session, a questionnaire structure is devised, and the ensuing responses are assessed. For the purposes of this study, the food and beverage SME sectors in Kedah qualify. A thorough examination of the organisation was conducted using its official

website. Two individuals were chosen as a representative sample and subsequently shortlisted for the case study.

The two organisations chosen for this study are both product providers with an approximate equivalent number of employees. In addition, the organisations were classified into short, medium, and long lists based on the year of their establishment. The purpose of this study is to analyse the digitalization strategies that have been implemented by the organisation throughout its extensive operational history. Malaysia has been designated as the region to facilitate comparisons. Moreover, the level of digitalization implemented in each region of the country varies. Firm A and Firm B, both Inc., were the finalist organisations for this research.

Following this, the interview-supporting questionnaire was formulated and appended to the manuscript. The experiences of the CEOs and owners of the companies were investigated, regardless of whether or not their organisations had adopted digitalization practises. Based on the objective of the study, TOE framework has been utilised to provide theoretical support and formulate questions to conduct interviews. The details of the interview questions are given in the appendix.

3.3 Research Methodology

Choosing the right sample for the study can only be done after the research questions and research strategy have been set. There are many things that affect the case study, such as the number of cases, the units of analysis, the time frame, and the choice of case companies and cases. Two case companies were chosen as examples for this study in the field of supply chain management, more specifically in the food and beverages industry. The following were the selection criteria: i) they were chosen to represent different parts of the network being studied, giving them different roles within it; ii)

they were connected in different ways; iii) they were all big names in the industry; and iv) their analysis would give a full picture of the network. Also, the different ways they shared power, played roles, and were connected in the network were important to the study's research goal and helped choose the case firm.

3.4 Case Study Selection

Yin (2003) suggests four different ways to do case studies. An embedded perspective uses more than one unit of analysis, while the holistic perspective looks at one or more cases using only one unit of analysis. The case that was looked at in the example case study was in the food and drink business and involved two different companies. Because of this, the case study was labelled as an embedded single case study. Understanding the pros and cons of doing business for SMEs in Malaysia's food and drink industry was the main goal of the study, so it was clear that this case was unique. In any case, this study looked at two different companies, which were the main focus of the study. As a result, there were many units of analysis, and the point of view could be called embedded. Dubois and Araujo (2007) say that using more than one unit of analysis makes the study stronger.

The goal of this study is to look at how SMEs in Malaysia's food and beverage industry are trying to take their businesses digital. Case studies should be carefully and strategically chosen to make sure that they fully understand the subject. The case studies are chosen based on the following important factors. There is a wide range of SMEs in the food and drink industry, with different employee counts and annual turnover rates. This could include micro-enterprises, small businesses, and medium-sized businesses so that we can get a full picture of digital transformation projects of all sizes.

Promoting inclusion across Malaysia's different regions is important to deal with issues like differences in how people use technology and the unique problems small and medium-sized businesses SMEs face because of their location. This includes areas that are rural, suburban, and urban. By looking at different sub-sectors of the food and drink industry, like dairy, processed food, drinks (both alcoholic and non-alcoholic), candy, and more, it is possible to see how approaches to digital transformation change depending on the types of products.

It is very important to find SMEs at different stages of adopting digital technology. At this point, these organisations are only starting to work on their digital projects. They are using cutting edge technologies like IoT, AI, and data analytics in the advanced stages, on the other hand. It is very important to pick case studies that show a range of outcomes, from successes like higher efficiency, market growth, and cost savings to those that ran into problems or setbacks along the way to digitalization.

SME participants who exhibit a willingness and receptiveness to exchange their perspectives, challenges, and methodologies with respect to digital transformation initiatives. By collaborating with these organisations, the research will gain access to a substantial and valuable dataset. Select a limited subset of case studies that can be examined consistently over an extended duration. The researcher will be able to observe the evolution of digital transformation over time. This makes an examination of the growth, evolution, and long-term viability of digital projects within these SMEs. When selecting cases to examine, maintaining the confidentiality of information, and obtaining consent from small businesses that assist in data collection and analysis, ethical considerations must be adhered to.

The case studies will provide a comprehensive depiction of the digital transformation being undertaken by SMEs in Malaysia's food and beverage industry, as determined by these selection criteria. Following a review of these various case studies, the subsequent comprehensive analysis will examine the advantages and disadvantages that these companies encountered when they transitioned towards digital.

3.5 Validity

A critical aspect of research as a whole pertains to the assessment of the study's validity and reliability. The quality of case research is contingent upon the research design's construct validity, internal validity, external validity, and dependability, according to Yin (2003). Stuart et al. (2002) suggest that construct validity and internal validity are the most crucial for the case study. It is important to acknowledge that the assessment of validity and reliability in qualitative and quantitative research approaches differs. In light of the example case study's qualitative nature, the study's validity and dependability were assessed in accordance with the principles of qualitative research. As a result, the definitions provided by Yin (2003) were endorsed and adhered to.

Construct validity is defined by Voss et al. (2002) as the degree to which accurate operational measures of the concepts under study are established. Yin (2003) and Stuart et al. (2002) assert that construct validity can be upheld by employing a variety of evidence sources, establishing a chain of evidence, and soliciting the review of case study reports by key informants (Beverland & Lindgreen, 2010). By utilising multiple sources of evidence (data triangulation), the construct validity of the example study was enhanced.

An assortment of informants was initially interviewed. Additionally, data was acquired from a variety of sources. The usage of investigator triangulation was apparent

in the data analysis and interview procedures, which involved the participation of six researchers. Moreover, the construct validity of the study was enhanced by the chain of evidence: each stage of the research was meticulously documented, and the entirety of the primary evidence is accessible and well-documented. According to Seuring (2008), despite frequent criticism regarding the case study's lack of rigour (Ellram, 1996), case study research remains a viable method for conducting comprehensive analyses of contemporary phenomena provided that the research process is methodically organised and meticulously documented.

In order to mitigate interview bias, the results were presented to the informants after the interviewees of the example case reviewed the case reports, as suggested by Jauch, Osborn, and Martin (1980). The fact that interviewees could provide feedback regarding potential researcher misunderstandings but were unable to alter the findings in their favour was of the utmost importance. It is advisable, according to Miles and Huberman (1994), to consult informants regarding the results and interpretations before retaining them in their initial form. Moreover, this process improves construct validity, as stated by Yin (2003), and Hirschman (1986) suggests that it can be utilised to assess the study's credibility.

External validity is the domain in which the results of a study can be generalised; that is, the degree to which the results accurately represent the phenomenon under investigation (Yin 2003). (see Ellram, 1996). Generalizability is defined by Neuendorf (2002) as the degree to which the results can be extrapolated to different situations.

Yin (2003) defines internal validity as the process of establishing a causal relationship, whereby it is demonstrated that specific conditions cause other conditions, as opposed to spurious relationships. Furthermore, Yin argues that internal validity is

of no consequence in descriptive or exploratory studies and is only relevant in causal or explanatory case studies. Therefore, considering the primarily descriptive nature of the example case study, internal validity was not deemed to be as significant as alternative forms of validity. However, in the case of a single instance, Stuart et al. (2002) state that pattern matching guarantees the correspondence between the proposed patterns and the data patterns, thus enhancing internal validity and providing strong evidence for a given proposition.

Consequently, consideration was given to internal validity, and consultations with key informants assisted in establishing the correlation between a specific outcome and a particular phenomenon. That is to say, the rationales for the problems were examined, which was deemed essential considering that the primary inquiry of the study was "how."

3.6 Reliability

Furthermore, when assessing the quality of research, reliability is an additional criterion to consider alongside validity. Yin (2003) defines reliability as the degree to which the procedures of a study can be duplicated and produce consistent outcomes. The common definition of qualitative research, according to Naslund (2002), is more subjective than quantitative research, which is therefore more objective (see also Morgan &Smircich, 1980). This frequently pertains to the function of the researcher. Hirschman (1986) elaborates on the concept of confirmability, proposing that external auditors be engaged to assess the logical and unbiased nature of the interpretations.

As an additional point, Yin (2003) discusses the use of multiple researchers in the context of study bias: preliminary findings should be reported to two or three critical colleagues, who should then provide alternative explanations, so as to test for bias and

tolerance of contrary findings. In the case study example, a number of researchers reviewed and provided feedback on the case reports. In addition to deliberating on the interpretations and findings, the research team engaged in discussions with the case companies regarding the results. "The purpose of reliability is to minimise the errors and biases in a study," as stated by Yin (2003, p. 37).

Yin (2003) further posits that the implementation of a case study protocol and the establishment of a case study database may enhance the study's reliability (Beverland & Lindgreen, 2010); the aforementioned suggestions were adhered to in the illustrative case study. As stated by Ellram (1996), "a case study protocol comprises the interview guide and the prescribed procedures for utilising the assessment instrument." As previously stated, a case study database was established, wherein meticulous documentation was maintained of the obtained evidence, stages of the research process, interview questions, and procedures. This approach significantly enhanced the reliability of the study. Furthermore, when assessing the quality of research, reliability is an additional criterion to consider alongside validity.

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3.7 Data Collection Method

Yin says that many kinds of evidence should be used to show that the study is valid and reliable in terms of its construct (2003). The authors of the study (2007) say that having more than one Informant gives researchers a chance to get a lot of different interpretations and meanings. This is very helpful for understanding how business relationships work when they are complicated. There should also be less interview bias if there are a lot of very knowledgeable sources who have different opinions on the main topic (Eisenhardt & Graebner, 2007). The case studies should triangulate their

data, which means getting information from more than one source and talking to more than one research informant. This will get rid of any bias that might be there.

Most of the time, interviews are used to gather information for a case study (Yin, 2003). The authors Eisenhardt and Graebner (2007) say that interviews are one of the best ways to gather a lot of useful empirical data. Interviews were also used to gather information for the example case study. For the purposes of the research questions and objectives of the illustrative case study, it was important to collect complete and detailed data. Interviews were chosen as the best way to do this. Because of the way the example case study was done, the questions were about the organisation itself (i.e., how it works) rather than about individual behaviour (i.e., individual behaviour) (Yin, 2003).

Hirschman (1986) and Yin (2003) say that theory should be used in case studies. For example, established theories should be used to come up with interview questions. The interview questions in the example study were based on the literature review and established theory. The informants asked about the pros and cons of digitalization for small and medium-sized businesses (SMEs) in the food and drink industry. The interview questions went through a validation process in which they were looked over and changed by several researchers (specifically, investigators of a given research project). Then, a small group of key informants from the case companies were used to test them. Those that gave problems were changed. As much as possible, the wording and order of the questions were kept the same for all participants.

But the interviewees were free to share their thoughts and opinions, and the questions were changed to fit the position and role of the informant within the organisation. When an informant talked about the pros of digitalization, the informants were mostly asked about the pros. On the other hand, when an informant talked about

the cons of digitalization in the food and beverage SME sectors, the informants were mostly asked about the cons. Investigative triangulation was made easier by the fact that seven interviewers were involved in gathering the data. Eisenhardt (1989) says that using more than one investigator has two main benefits: it increases confidence in the results by bringing together different observations, and it makes the study more creative by adding different researchers' insights that make the data richer.

Multidisciplinary researchers' participation was helpful both during the data collection and analysis stages. For example, by talking about interpretations and findings, the researchers brought to light different points of view and observations. Representatives from the two case companies, experts, and officials in the example case were interviewed seven times in a semi-structured way. The above information was gathered using an audio recorder to make sure it was correct and lower the chance of researcher error. As it turned out, the saturation point was used to see if the interviews were enough. In case studies, this often happens.

Eisenhardt (1989) says that data saturation happens when more interviews that confirm the existing interview data do not give any new information that is useful for the research questions. The people who were interviewed for the study were picked because the informants were involved in Malaysian small and medium-sized businesses that deal with food and drinks and digitalization. For more information and different points of view, interviews were done with people in high-ranking positions within the companies or in other high-level positions (i.e. CEO). There was an interview with the owner of Firm A, which was the case network's main firm and had both pros and cons, so that both points of view could be heard.

In the same way, Firm B was asked to give their opinion on the pros and cons of digitalization in the Malaysia SMEs food and drink industry. Because the companies had different reactions to the same issue, this led to some interesting results. Eisenhardt says that case study data can be either qualitative or quantitative, or both (1989). Tesch (1992) says that qualitative data is any information that is not a number that the researcher gathers.

In fact, Miles and Huberman say that qualitative data is "a source of well-grounded, rich descriptions and explanations of processes in identifiable local contexts" (1994). Both qualitative and quantitative data were used in the example case study. However, to make sure the validity, only quantitative data were used, as was done in previous research. The numerical and quantitative data, which included basic facts about the case companies, came from a database that held data on companies. The interview data were the main sources of information for the study.

3.8 Data Analysis

Miles and Huberman (1994) and Griggs (1987) posit that case research data analysis techniques may encompass data reduction, data presentation, verification, and conclusion derivation. Indeed, data analysis constitutes a pivotal phase within the case research process. After completing data collection, the researcher must possess an understanding of data analysis techniques. This section elucidates the way the data analysis procedure was implemented in the case study provided and offers direction on the appropriate presentation of the findings.

Auxiliary records were utilised to document each interview, while audio recordings were maintained during the example case. Precise transcriptions were produced from the recordings, integrating non-verbal cues including prolonged pauses

and laughter. The transcripts generated a total of 36 pages of data, of which 18 pages per interview. After the interviews were transcribed verbatim, the resulting qualitative data underwent several rounds of review, during which annotations and precoding were applied. Pre-coding was performed on the data in accordance with the interview themes.

This objective was achieved by employing color-coding and supplementing the transcriptions with supplementary annotations. By conducting multiple readings of the data, the researcher gained a deeper understanding of it and commenced the process of organising and structuring the information into logical units. By following this method, the researcher gains a deeper understanding of the intrinsically meaningful patterns, themes, and categories of significance that are inherent in the data (Shaw, 1999). Following an exhaustive analysis of the data, the information was color-coded in accordance with the themes of the interviews.

Furthermore, in accordance with Griggs's suggestion, abbreviations were utilised as codes and annotated in the margins of the transcripts (1987). The pre-coding served as the foundation for the final coding. This approach demonstrated adherence to the interview themes by presenting a logical, systematic, and reliable strategy that upheld the integrity of the chain of evidence. The coding process was executed using the Atlasti software, and it underwent several rounds of subsequent review. Coding was employed to organise, structure, and assign meaning to the raw data (see Shaw, 1999; Strauss & Corbin, 1998). Through the utilisation of color-coding, in which an individual colour was allocated to each subject or theme, a comprehensive tally of three themes were identified. The coding procedure was utilised as the fundamental basis for categorising the data according to themes.

According to Dey (1993), the data loses its initial shape during the categorization process, which involves dividing it into relevant blocks for analysis. Nevertheless, it facilitates a more streamlined procedure of comparison. Comparison is an essential element of data analysis, as stated by Strauss and Corbin (1998), due to its capability of identifying discrepancies in the identified patterns. Additionally, this methodology functions as a method for reducing data and provides a preliminary phase of examination (Miles & Huberman, 1994; Tesch, 1992).

Data reduction is defined by Miles and Huberman (1994) as "the process of selecting, concentrating, simplifying, abstracting, and transforming the data." Additionally, according to Griggs (1987), data reduction should not be confused with data deletion or neglect. Data display, on the other hand, comprises a multitude of visual components, including quotations, tables, and matrices (Griggs, 1987). In the given example, the coded and categorised data were subjected to a thematic analysis.

Tesch (1992) defines content analysis as a comprehensive process that incorporates diverse components, such as themes, words, sentences and paragraphs In this particular case, the entities in question were sentences. It would have been impractical to deconstruct them into individual words, as the aim was to conduct a qualitative analysis of the meanings rather than to divide words into more substantial entities. Furthermore, paragraphs were utilised as units of analysis because understanding the interviewee's main points and their meanings at times required more than a single sentence.

In accordance with Yin's (2003) suggestion that establishing a database, implementing a case study protocol, and verifying the chain of evidence can increase the reliability of a study, this advice was followed in the illustrative instance. The

implementation of a case study database facilitated the methodical organisation of qualitative data while also ensuring the maintenance of a sequential presentation of evidence. In order to streamline the analysis process, the coded and categorised data were documented in distinct documents. However, the original file containing all interview data was preserved.

The case study database comprised every piece of this information, including the initial transcriptions, data that had been coded and categorised, summaries, memos, matrices, and mind maps. The data underwent a separate analysis that was consistent with the principal theoretical frameworks. Despite this, numerous documents employed the exact same data in order to verify the relationships between the constructs.

Furthermore, the utilisation of mind maps enabled the discernment and examination of the interrelationships between different concepts and themes, in addition to elucidating the interrelationships within the case studies. This phase enabled the cultivation of a deeper understanding of the overarching concept. A multitude of summaries, mind maps, matrices, and memos were produced during the data analysis phase. Incorporating and contrasting the interview data with supplementary empirical data. Following this, an assessment was conducted on each piece of data in light of the theoretical insights, with an effort to detect any interfaces. The procedure involved a re-examination of the literature review and the collection of additional sources in order to support or clarify the empirical results.

3.9 Summary of the Chapter

The chapter introduced case studies in detail along with its types. Later on, how to select and research questions and particular case studies are also being discussed. Moreover,

choosing data collection method and data analysis is discussed based on justification of required selection.

CHAPTER FOUR
ANALYSIS

4.1 Introduction

This chapter focuses on the empirical findings of observation and semi-structured interviews. To answer the following research questions: What potential advantages could the digital transformation of food and beverages have for Malaysian small and medium-sized enterprises? And what potential challenges can small and medium-sized food and beverage companies have when used digital technology? The empirical findings are organised into three themes: technology, organization and environment.

4.2 Background of the Companies

The case study companies are included two food and beverages SMEs. All the organization involved in the development and producing food and beverages products. An overview of the two companies is shown in Table 4.1.

Table 4.1: Background of the Companies

Firm	Primary Functions	Market Segments	Recognition/Awards
A	Design, development and manufacture food and beverages.	-Malaysia -Focus on local area of Kedah	• Halal Certificate • MeSTI Certificate
B	Design, development and manufacture food and beverages	Malaysia -Focus on northern, Kedah	• Halal Certificate • MeSTI Certificate

4.2.1 Firm A

Firm A was started in 2003 and has 8 full-time employees right now. Food items like cookies, bread, cakes, and chocolates are the main things that are made. Some of the

products are regularly made so that they can be sold directly at their store or through agents, distributors, and retailers. After being in business for almost 14 years, the firm was able to make up to thirty (30) different products. The firm used to only make cookies, but now it also makes chocolate products thanks to the founder, who is also the director. The business is run in two different places.

During the holiday season, especially during Hari Raya, there is a huge demand for products, and that month alone brings in about RM40,000. Normal business, excluding Hari Raya, brought in about RM20 to 30,000 a month. Workers have been given specific training to improve their skills and knowledge in making the products. The firm got project timelines that were based on what was ordered. For a new product to meet customer needs, it needs its own product strategy. Refer to Table 4.2 for the summary of Firm A.

Table 4.2: Details of Firm A (Interview: Section A)

Items	**Details**
Year founded	2003
Types of products (Tailored and routine)	• Bread • Cookies • Cakes • Chocolates
Customers	• Distributors • Agents • Direct selling from own physical store
Projects	• Tailored product for external customers • Routine processing • New product development • Research
Future business planning	Expansion of current business factory with the store.

4.2.2 Firm B

The business began in 1964 and has about 8 employees at the moment. One (1) worker is part-time, while seven (7) work full-time. The business was started by a Bumiputera and was one of the first coffee shops. Its founder, Osman Ahmad, was able to get attention from many groups, especially government agencies. The campaign to support the firm was able to help it open for business. It all began with small amounts of coffee being made at home before it spread and became very popular. At some point, business growth slows down because they are no longer welcome since there are so many other companies, some from other countries. As of when the new manager took over, the factory was only open once a month and made about RM2,000 in sales. Refer Table 4.3 for the summary of Firm B.

Table 4.3: Details of Firm B (Interview: Section A)

Items	**Details**
Year founded	1946
Types of products (Tailored and routine)	• Bread • Cookies • Coffee • The Tarik • White Coffee • Coffee Durian
Customers	• Distributors • Agents • Direct selling from own physical store
Projects	• Tailored product for external customers • Routine processing • New product development • Research
Future business planning	Market expansion to abroad.

4.3 Data Analysis

In addition to the inclusion of sub-sections to this domain of the framework, the thematic analysis of the digitalization section is grounded in empirical findings from observation and semi-structured interviews. The analysis of data is interpreted according to the themes in the proposed conceptual framework in Figure 4.1.

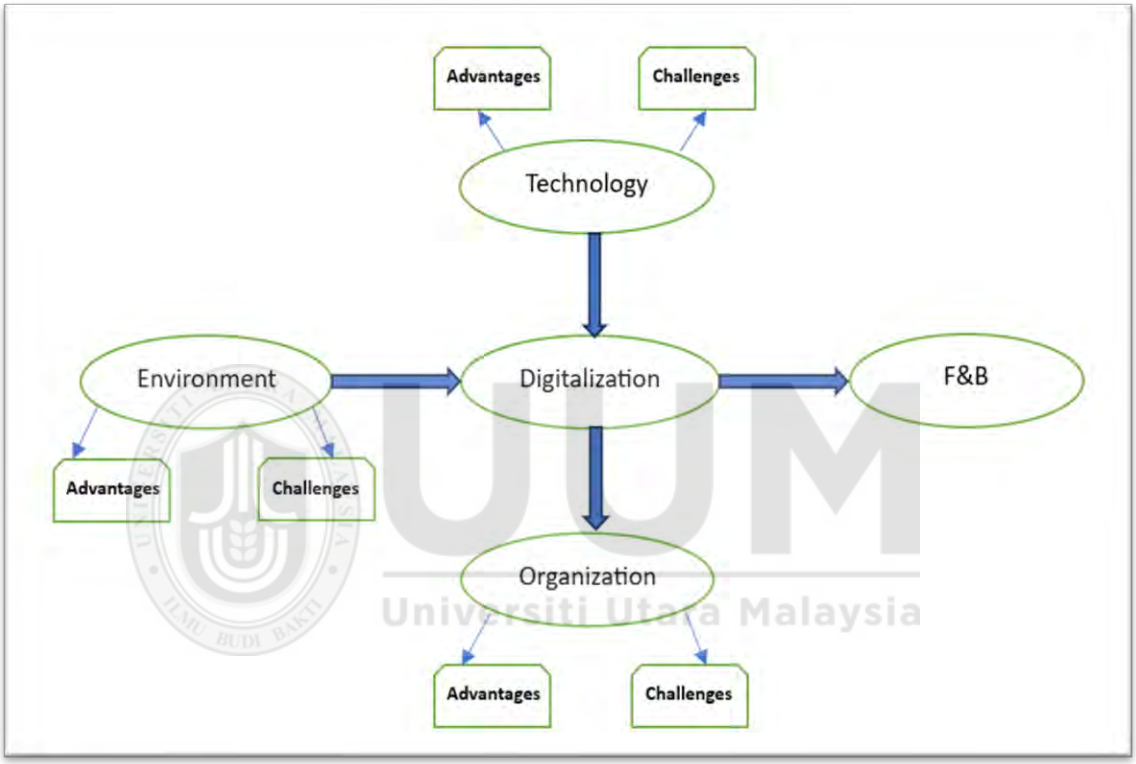

Figure 4.1: The Thematic Analysis of Digital Transformation Based on the Conceptual Framework.

4.3.1 The Technology Theme

Following are the results of the advantages and challenges under technology theme:

4.3.1.1 Advantages

Based on the observations and opinions of informants, it has been determined that a firm's digitalization strategy is the most important and crucial step in analysing the effectiveness and implementing new technologies, such as using a new software or purchasing promotion versions of a software that the firm is already using. According to the CEO of Firm A, one of the most important aspects of this phase is answering the following question: "How does your firm prioritise the incorporation of new technologies into the existing framework?" In subsequent board meetings, the significance of the strategy's objective would be explored. This phase can be identical to setting objectives in the framework. Firm B referred to the following phase as the design of a digital strategy, which entails subdividing the procedures and implementation process of the new technology into smaller steps. The final phase is to implement the plan within the organisation.

According to the interview with R1 from Firm A, it is demonstrated that the firm analyse efficiency in the initial stage. "First, we evaluate the available possibilities. We should have precise dates and a wealth of information regarding the orders. This is why a dependable and competent software is essential for the firm." In addition, Digital Goal Setting and Strategy Formulation are the following elements of Firm A 's digital strategy. After completing these steps, the new technology will be implemented.

In addition, R1 from the owner of Firm B underlines that "the first stage in digital strategy is to determine what our needs are and why we need it. Is it for our benefit or for the customer's?" The reply to writes, "We have a long-term intention to establish a website-orderable platform," which explicitly refers to Digital Goal Setting inside the

framework. They will then formulate and implement a digital strategy following these stages.

Regarding the R2: to identify the potential problems that food and beverage SME's may face while integrating digital technology, “We prioritise efficiency." We are efficient with the current programmes and strive to make them as easy as feasible. We are not currently investigating digitalization. We want to make everything as straightforward as possible.

4.3.1.2 Challenges

Observations at Firm A indicate that preparing the personnel to adapt the new technology is one of the most important topics discussed by decision makers. It is essential to anticipate the opposition of elder staff members to change. The firm's top executives analyse the strengths and weaknesses of the human resource before deciding how to manage the transition, how the workforce should learn about the new technology, and why they must digitalize its supply chain. In May 2022, for example, they decided to use an Excel-based project planning programme. To reduce the resistance of some employees to the new programme, a series of meetings were held to first explain the necessity of the programme, then its benefits, and finally to educate the staff on how to use it. Lastly, explain to the staff how the new software can reduce risks during the duration of the project and improve communication with raw material suppliers. Through these discussions, the organisation was attempting to transition to a digital culture.

Based on R2's reaction, Firm A believes that, due to the rapid rate of digital transformation in other organisations, particularly in the supply chain, it will take time for them to adopt a digital culture. On the other hand, the environment influences the

digital transition, as evidenced by the statement, "Our office is technologically advanced." Here, we are utilising the most recent manufacturing software and machinery. In addition, we have the most up-to-date equipment in the factory, but it is difficult to use computer programmes there due to the tough environment. Due to the manufacture of some items, it is possible for tablets to break, for instance.

To deploy new technologies and make proper use of them within the organisation, it is essential to first familiarise the staff with them. As discussed in the preceding section, it is now time to permit the workers to utilise the new technology after educating them. In the case of utilising the new Excel application for project planning, the top-level managers ensured that the tool is compatible with the project managers' desktops, tablets, and mobile devices.

Working from home was another topic of working enablement conversations in the organisation. After several board meetings, they announced that it is not possible for more than 90 percent of Firm A employees to work from home; only the accounting and marketing departments have this option in exceptional circumstances. The most important factor in this decision was the fact that there are only ten employees in the office; if fifty percent of the office personnel want to work from home, just five people will remain.

After preparing the workforce to utilise the new technologies, the implementation phase will commence. One of the shortcomings in the digital operation phase was the firm's lack of digital operation management, which was caused by a lack of human resources, time, and money. For example, R2 states, "to identify the potential challenges that food and beverage SME's may face when implementing digital technology, that we have now is from the old guard, but now we are noticing that they

are more and more from the younger generation who are starting to work in our customers' companies, so I have recently realised that we do not have this technology at the moment.

Based on the products and services offered by Firm A, only product data sheets, newsletters, brochures, and catalogues are available. In this sense, the corporation does not invest a significant amount of time or money customising them or analysing their lifecycle or ecology. For instance, product data sheets are standard documents based on the characteristics of the product, the raw materials used, and the manufacturing process, thus no changes are permitted.

Moreover, R2 approved the lack of personalization of digital products and services due to the nature of the products they produced. "Unfortunately, we can not offer this type of personalised digital product, and we must always have direct contact via telephone or email in order to ensure continual progress and accurate delivery. Once or twice each year, we upgrade digital items such as digital brochures based on customer feedback, investigations, and adjustments. Sometimes we employ businesses to verify all of these records.

4.3.2 The Organization Theme

Following are the results of the advantages and challenges under organsization theme:

4.3.2.1 Advantages

Implementing new technology begins with defining each implementation stage. Defining the function of each individual, time scheduling, planning, and introducing the new technology to the entire team who will be utilising it, followed by its implementation. Time and cost are two essential factors that the project manager

carefully examines. In March of 2022, Firm A planned to implement a method to control the transportation of its manufactured goods. The most essential reason for utilising this application was to reduce the amount of time spent organising the transfer of pieces, as well as to lessen the chance of delivery errors and prevent penalties. The project manager and transport manager had a meeting to analyse the advantages and disadvantages of the technology-based transport planning programme based on the observations made after the first delivery made under the new programme. In this instance, the significance of project management from initiation to evaluation was evident.

Within the examined supply chain, the project management procedure is identical. According to R1, the planning of the project, which can be termed the initiate phase, precedes the implementation of the process. In the last phase, the process will be evaluated. R1: "Initially, the person accountable in the organisation for managing the deployment of the new technology attempts to comprehend the entire process of utilising the new technologies, and then explains and educates their coworkers. We could conduct training sessions with the service provider."

4.3.2.2 Challenges

According to the observations, educating the personnel is one of the most crucial steps in the process of introducing new technology. According to the June 2022 weekly meeting of managers, the CEO of Firm A stated, "In order to achieve the best results with the new project planning programme, the project managers must be trained on how to use it. If we invest a few hours in training the staff, we can avoid future errors." In the firm, there is a lack of post-training analysis of how the workforce interacts with the new technology and how they collaborate with it.

Due to a lack of time and qualified personnel in the field of digitization, the top management is unable to conduct this analysis. The cause of this condition can be investigated through additional research. According to Informants, the absence of Human-Technology Interaction and Human-Technology Collaboration is evident. For example, it is claimed that "User training is very vital in the organisation, and we are happy to educate the human resource to adapt their knowledge to the latest technologies, but there is no plan to analyse the interaction or collaboration between humans and technology.

Before integrating new technologies, it is essential to examine the existing state of the organisation based on the managers' weekly meetings. Therefore, the initial phases consist of analysing the requirements and assessing the organization's current state. The purpose of this phase is to cut expenses as much as possible. Then, the process infrastructure is evaluated by the executives. Intriguingly, it is evident that the business can modify the process but not fully alter it. During the period of observation, the infrastructure of the product is not altered or modified. One explanation for this is that there is now no demand in the supply chain to change the products.

The Informants concur that infrastructure evaluation is the initial step in the formation of technology infrastructure. Regarding this, the informants added, "We must first examine the infrastructure before implementing new technologies." Regarding the Product infrastructure, R1 says there is no need to change the products in the supply chain at this time, but the process infrastructure can be adjusted and improved. First, due to the lack of time and personnel, then the investment risk.

After making observations, evaluating the situation, and defining the firm's goals and requirements, it is now time to deploy the necessary technology. This new

technology may be for the firm's processes, goods, or administration. In April 2022, for example, the Digital marketing department of Firm A required two platforms for developing digital content, including video and an SEO analytics platform. Therefore, the corporation chose to invest in and adopt them as new departmental technology.

Informants 1 and 2 concur with supply chain process, product, and technological solutions. However, they prioritise Process enablers and Technology solutions and believe that product enablers require time and personnel. R2 asserts, "First, we need to determine what we need and what we should do; secondly, we can begin implementing the new technology." To have an integrated platform, for instance, there are a number of questions that must be answered before it can be implemented. Once all of these questions have been answered, we must review the system and then inform the entire team.

4.3.3 The Environment Theme

Following are the results of the advantages and challenges under environment theme:

4.3.3.1 Advantages

On the basis of the observations, the Firm A and Firm B have a substantial mutual goal of developing new digital supply chain strategies. For instance, digitising the project's paperwork, archiving the designs, and controlling assessments are the most critical supply chain concerns. Therefore, in order to attain these shared objectives, businesses must adopt new integration methods with their suppliers and customers. In this regard, the first step for the organisation is to create new objectives. All participants in the supply chain share information via digital platforms to improve documentation and reduce error risk during project execution.

Firm A, for example, provides a transport option to facilitate the installation phase for the customer, based on the terms of the contract. Based on the agreements for larger projects, the informants indicate that they will share risks in exceptional circumstances to decrease the risk of profit loss for both parties.

Setting new objectives was not mentioned as the initial stage in Supply chain integration in R1., all Informants concur that they share information and expertise throughout the supply chain. "We are able to share knowledge if the supplier or customer so requests." All Informants indicate that they may exchange resources for special projects. "It depends on the project and contract; for example, we share row materials with certain suppliers." Similarly, to the outcome of the observation, none of the Informants agree that there is an organisational link between the supply chain actors.

4.3.3.2 Challenges

During data collection via observation and interviews, one of the primary objectives of the observation was to identify the firm's most significant problems in transitioning to a digital supply chain. Top executives acknowledged the firm's issues, one of which was the use of new technologies and digital transformation in order to strengthen relationships with other supply chain actors. In addition, Informants were asked to identify the most significant obstacles in the digitalization process. In this section, the most significant issues are outlined.

It was evident from the statements of the organisations' informants that money was the primary priority of the top management and project managers. Firm A most major barrier to transitioning to a digital supply chain was the possibility of losing money and the amount of time that would be required. One of the topics of the meeting was the firm's purchase of the Impact platform. The top executives were concerned

about investing large sums of money. After analysing the department's revenue and turnover, they decided to delay the purchase of this platform until the following year. Overall, the CEO and board members were concerned about the cost and duration of implementing new technologies.

In this context, R2 identifies the absence of infrastructure for transporting items and acquiring software as the greatest obstacles to the digitization process. It is stated: "lack of raw materials, lack of infrastructure, and now we observe that the industry is stalled in shipping due to the absence of logistic routes; we should consider this.

Human resource, according to the observation, is the second difficulty of digital transformation. The majority of the firm's employees are of an older generation, and their aversion to change is one of the hurdles they face when the firm implement new technologies to digitalize their supply chain. For instance, the purchasing system from one of the suppliers was updated, and the supplier requested that the previous version be updated. The observer observed that some of the staff resisted using the new platform, despite the fact that it was functionally superior for purchasing. Therefore, human resource is the second most significant obstacle for the organisation to overcome when it transitions to a digital supply chain. It is also stated that "the elderly may have trouble adapting to new technologies.

According to the observation, the firm's struggle to transition to a digital supply chain is also complicated by a lack of supply chain management experience. Due to budget constraints, the firm lacks a supply chain manager who would bring knowledge of supply chain standards into the organisation. The executives are not fully aware of the most recent digitization trends in the supply chain. Consequently, a lack of supply chain understanding is the second major hurdle facing the business. R2 identifies the

absence of human resource knowledge and language barriers as further obstacles to digital transformation.

Lack of information results in the absence of a strategic plan for the digital transformation of the supply chain. Every change and transition in a firm, whether a small or medium-sized business or a major corporation, need a strategy to achieve its aim. Observationally, one of the firm's issues is the absence of strategic planning for the digital supply chain transformation.

According to R2, one of the obstacles in the transition to digitization is the policies that restrict international business relationships and prospects. Regarding this, it is noted, "We buy a great deal from China, but I do not believe it is simple to link to the China supply chain; country rules present a difficulty here.

4.4 Conclusion of Thematic Analysis

Table 4.4 shows the conclusion of thematic analysis that has been performed and found in the study.

Table 4.4: Conclusion of Thematic Analysis

	Firm A		**Firm B**	
	Advantages	**Challenges**	**Advantages**	**Challenges**
Technology	Digital goal setting Digital Strategy Strategy Transformation	Investment Cost Data Security and Privacy	Increased Efficiency Enhanced Reach Improved Decision-making Sustainability Cost Savings	Initial Investment Costs Skill Gaps Cybersecurity Risks Adaptability to Change
Organization	Reduce the amount of time organizational tasks	Lack of digital skills Employees' willingness	Scope of business operations	Size of the firm Subjective norms

	Reduce the cost of organizational tasks Efficiency and accuracy			
Environment	New objectives Improve documentation reduce error risk	Transitioning to a digital supply chain Top executives acknowledged the firm's issues lack of infrastructure	External support Trading partners' readiness	Competitive pressure

4.5 Chapter Summary

The chapter entails key findings of the study. Thematic analysis was used to analyze data through in-depth interviews. Three major themes were emerged from the data which are technology, organization, and environment. Resultantly a theoretical model was developed based on the themes which will be beneficial for the future studies in order to digitalize supply chain management in Malaysia.

CHAPTER FIVE
RESULTS AND DISCUSSION

5.1 Introduction

The chapter discusses the main findings of the study. It includes major themes such as technology, organization and environment. The chapter ends by providing recommendations and limitations of the study.

5.2 Discussion

This chapter comes after the results and analysis. It talks about the results and uses the empirical data to come up with discussion points. This part talks about the main parts of the findings and contributions, looking at them from both a theoretical and a practical point of view. The research came up with three main themes: technology, organization, and the environment.

5.2.1 The Technology Theme

Following are the discussion of the advantages and challenges under technology theme:

5.2.1.1 Advantages

Due to digitalization, SMEs can now access a broader range of customers via social media, e-commerce, and online platforms. Enhanced consumer engagement and heightened visibility are facilitated by this expanded scope. Digital instruments simplify a number of operational processes, such as inventory management, supply chain logistics, and order processing. Automation increases overall productivity and reduces the frequency of human error. Gaining access to data analytics provides valuable insights into consumer preferences, conduct, and market trends. This data can

be utilised by SMEs to execute their marketing strategies, make informed decisions, and more precisely target their services.

Technology has enabled customers to engage in personalized experiences through mobile applications, make online purchases, and receive deliveries. Enhanced convenience and responsiveness have the potential to increase client loyalty and satisfaction. By adopting digitalization, SMEs can introduce novel products, services, or business models, thereby fostering innovation. The firm can maintain their market competitiveness by differentiating themselves through the use of technology. Although digital transformation does entail an initial investment, it can yield long-term cost savings through operational efficiencies gained from streamlined processes and optimized activities. It is imperative to procure hardware, software, and infrastructure in advance in order to successfully deploy digital technologies. Many SMEs, particularly smaller businesses operating on a more limited budget, might find these costs prohibitively expensive.

5.2.1.2 Challenges

Insufficient digital literacy and proficiency among the workforce may hinder the adoption and effective utilization of technology. It may be difficult for SMEs to locate or finance personnel with the necessary expertise in digital platforms and tools. An increase in digitization heightens the vulnerability to cyberthreats such as hacking, fraud, and data breaches. Organizations that handle sensitive consumer and operational data inevitably prioritize concerns regarding data privacy and robust cybersecurity.

Conventional (SMEs) in the F&B industry may exhibit resistance to change as a result of entrenched practises and an unwillingness to embrace novel technologies. This opposition can be challenging to surmount in order to foster an innovative culture.

Particularly intoural regions, access to adequate infrastructure and high-speed internet may be limited in some locations. The absence of connectivity could potentially impede the effective implementation of digital solutions. SMEs may find it challenging and time-consuming to remain abreast of evolving regulations and compliance obligations in the digital domain, specifically with regard to online transactions, data protection, and food safety.

5.2.2 The Organization Theme

Following are the discussion of the advantages and challenges under organsization theme:

5.2.2.1 Advantages

Through the automation of tasks and the streamlining of operations, digitization boosts overall output. The ability of SMEs to achieve more with fewer resources boosts their productivity. The presence of analytics and real-time data enhances the ability to make well-informed decisions. For the purpose of devising strategic decisions, businesses may analyze operational performance, market trends, and customer behavior. Digital tools facilitate greater adaptability and responsiveness of SMEs to market shifts. Enterprises possess the capacity to expeditiously adapt their offerings or strategies in accordance with real-time insights. Digital platforms afford small and medium-sized businesses (SMEs) the capability to provide personalized experiences, optimize the ordering procedure, and augment customer support. These fosters strengthened consumer loyalty and relationships.

By implementing digital transformations, SMEs have the ability to carve out a distinct market position. A technological application that is novel and inventive can

function as a distinguishing element that sets one organization apart from its competitors. Digital platforms afford (SMEs) the opportunity to achieve global consumer expansion by surpassing geographical constraints.

5.2.2.2 Challenges

SME implementation and access to digital technologies are hindered by their limited financial resources and expertise. This involves the acquisition of necessary hardware, software, and skilled personnel. Integrating digital solutions into well-established organizational structures and processes can present challenges. Potentially required are modifications to operational procedures and workflows; these may provoke resistance from personnel accustomed to traditional methods. The responsibility of overseeing and analyzing vast quantities of data generated by digital systems can be quite formidable. SMEs might lack the essential capabilities required to effectively organise, analyze, and derive meaningful insights from this data.

SME systems that fail to undergo continuous upgrades or adjustments in response to the swift advancements in technology encounter a significant challenge. Ongoing commitment to training and staying informed about emerging digital trends is crucial. The utilization of digital platforms by SMEs renders them more vulnerable to cyber threats. The protection of sensitive data and the establishment of resilient cybersecurity protocols are of utmost importance. Resistance to change within an organization may impede the advancement of digital transformation initiatives. Employees might exhibit a hesitancy towards embracing innovative technologies or making adjustments to established work protocols.

5.2.3 The Environment Theme

Following are the discussion of the advantages and challenges under environment theme:

5.2.3.1 Advantages

The implementation of digitization has the capacity to yield numerous advantages, such as decreased dependence on resource-intensive traditional processes, decreased paper usage, and reduced dependence on physical storage facilities. Digital tools contribute to carbon emission reduction through the facilitation of remote work and virtual collaboration, which obviate the necessity for in-person meetings and commuting.

By facilitating the implementation of energy-efficient appliances, intelligent inventory management to minimise waste, and data analytics to enhance forecasting and planning, digital systems are instrumental in optimising resource utilisation. While there may be an initial financial investment, the adoption of sustainable technologies—such as packaging that is friendly to the environment and energy-efficient appliances—could yield significant long-term financial advantages and reduce the ecological impact. Digital platforms can promote environmentally conscious purchasing by heightening consumer consciousness regarding sustainable practises and environmental concerns.

5.2.3.2 Challenges

While digitalization does offer operational benefits, it can also lead to environmental concerns such as increased carbon emissions from online deliveries, decreased energy consumption as a result of obsolete technology, and a rise in electronic waste produced by obsolete technology. The cost and implementation challenges associated with

environmentally sustainable digital solutions may lead to a preference among SMEs for more cost-effective options rather than greener alternatives.

Digitization impacts the supply chain by potentially increasing packaging waste, transportation emissions due to online deliveries, and energy consumption from data centres hosting e-commerce operations. It is crucial to prioritise the proper disposal and recycling of electronic devices and equipment to prevent the accumulation of e-waste in the environment as technology progresses or becomes outdated. Although digitization offers numerous benefits, economic disparities and inadequate infrastructure may hinder technological access for certain segments of the population or regions.

5.3 Limitation

Despite the fact that this research develops a framework for the digitalization of SMEs it has certain drawbacks. For example, the scope of this study is restricted to the food and beverage industries in Malaysia. Due to scheduling constraints, only two companies have contributed to this study. As the investigated SMEs lack a supply chain manager or digital transformation manager, the researcher was required to conduct interviews with the top-level management of the companies, such as project managers and sales managers, who are better familiar with the technologies and digitalization process. In addition, all of the companies are headquartered in Malaysia, which is an additional constraint of the study.

5.4 Recommendation

This study based on observations and semi-structured interviews with two enterprises in a supply chain has not been field-tested. Therefore, it is suggested that future

researchers evaluate the framework in the real world to confirm its validity and functionality. The framework can be enhanced by testing, as deficiencies can then be remedied. To validate the generalizability of the model, it is suggested that the framework be evaluated by SMEs in various industries and nations. It is beneficial for professionals in the subject, such as digital transformation managers and consultants, to test it, as they can examine it from multiple perspectives.

Another recommendation is to examine the obstacles to developing digitalization for SMEs, since this research addresses five of them. A future study might be more focused on obstacles in different industries and countries in order to clear the path to developing digitalization for SMEs.

5.5 Conclusion

This study examines the digitalization roadmap and challenges faced by beverages and food SMEs in Malysia. It identifies three key processes: technology, organization and environment. The technology process includes digital strategy, digital organization and culture, digital operations, digital products and services, and digital customer experiences. Technology implementation consists of project management, human and technology relations, technology infrastructure, and technology enablers. Organization consists of five components: integration, automation, business model transformation, supply chain reconfiguration, analytics, and supply chain process. However, some subcomponents differ from the core framework, such as digital effectivity analysis, digital operation management, and infrastructure evaluation. The study also addresses environment theme which includes the structure of the industry, the presence or absence of technology service providers, and the regulatory environment lack of strategic planning, and country policy struggles.

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APPENDIX 1

Interview Protocol: Digital Transformation in Food and beverage SMEs in Malaysia: Investigating Advantages and Challenges

Introduction:

Hello, thank you for participating in this interview. I am conducting research on the topic of Digital Transformation in Food and beverage SMEs in Malaysia, with a focus on investigating the advantages and challenges faced during this transformation journey. Your insights and experiences as a key stakeholder in the industry will be invaluable for this study. The interview will take approximately 45 to 50 minutes. Please be assured that all information shared will be kept confidential, and your participation is entirely voluntary. If you have any questions or concerns at any point during the interview, feel free to let me know.

1. **Technology Organization Environment Framework**
   a) How does your organization prioritize the integration of new technologies within its existing framework? Can you provide examples of recent instances where technology adoption positively impacted your operations or customer experience?
   b) In what ways does your organization approach the balance between maintaining data security and leveraging emerging technologies that often require sharing or accessing sensitive information? Can you elaborate on any strategies or protocols in place to mitigate potential cybersecurity risks?
   c) Could you describe the collaborative dynamics between different departments or teams within your organization when it comes to implementing new technological solutions? How does your organization foster effective communication and collaboration between technical and non-technical stakeholders during the technology adoption process?

2. **The Technological Context**
   a) How do you perceive the current technological landscape within your industry, and what emerging technologies do you believe will have the most significant impact on your organization's operations and strategies in the next 2-3 years?
   b) Can you share specific instances where your organization successfully adapted to disruptive technological changes or failed to do so? What were the key factors that contributed to either successful adaptation or challenges in embracing new technologies?
   c) In what ways does your organization stay informed about the latest technological trends and innovations? Could you provide examples of initiatives or partnerships that demonstrate your commitment to remaining at the forefront of technological advancements within your field?

3. **The Organizational Context**
    a) Can you describe the organizational structure and decision-making processes that influence the implementation of new technologies? How does your organization ensure that technological initiatives align with overall business goals and strategies?
    b) How does your organization foster a culture of innovation and technological readiness among employees? Could you provide examples of initiatives, training programs, or incentives that encourage staff to embrace and contribute to technological advancements?
    c) Can you elaborate on your organization's approach to change management when introducing new technologies? How do you address potential resistance from employees and ensure a smooth transition while maximizing the benefits of technological changes across various departments and levels of the organization?

4. **The Environment Context**
    a) What advantages or benefits has your firm experienced as a result of digital transformation initiatives?
    b) Can you highlight specific areas where digital technologies have significantly improved operations, productivity, or customer engagement?
    c) What challenges did your firm face during the process of digital transformation or in adopting digital technologies?
    d) Were there any unforeseen obstacles that arose while implementing digital strategies?

Conclusion:

Thank you for sharing your valuable insights and experiences with us. Your input will be crucial in understanding the advantages and challenges of digital transformation in food and beverage SMEs in Malaysia. If there are any additional points you would like to add or any further information you wish to share, please feel free to do so. Your contribution will greatly contribute to the success of this research.