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**THE INFLUENCE OF SYSTEM'S INTERACTIONS ON HALAL
BUSINESS PERFORMANCE IN SMALL-MEDIUM ENTERPRISES
FOOD MANUFACTURERS**

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In Fulfillment of the Requirement for the Degree of Doctor of Philosophy**



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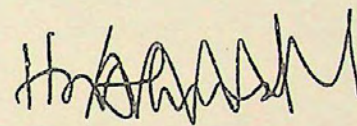
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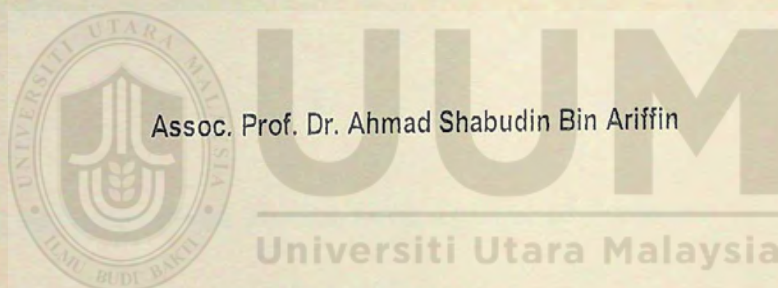
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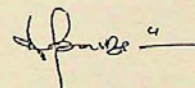
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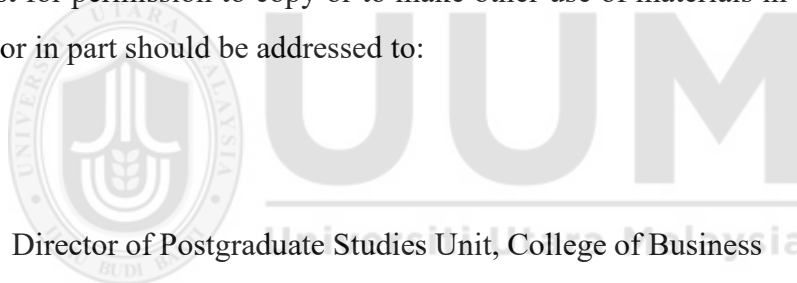


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ABSTRACT

Halal products are becoming more popular worldwide, including in Malaysia. Recent trends emphasize halal business performance in small-medium food manufacturers. The purpose of this study is to examine the system's interactions that consisted of machine, people, and knowledge management and small-medium enterprises (SME) halal business performance in Malaysia. The underpinning theory used in this study was System Theory which highlighted the importance of the interactions of the key variables i.e. machine, people, and knowledge management on the outcome of the business. Hence, the System Theory underpinned the research framework. The environment served as a mediator between the key variables and halal business performance. Data were collected from respondents among the top management who represented SMEs halal food manufacturers. Thus, the unit analysis in this study was the top management who consisted of mainly the owner and the Chief Executive Officer of the company. The Partial Least Squares Structural Equation Modeling (PLS-SEM) main steps were conducted accordingly when used for the data analyses. The key findings showed machine and knowledge management were significantly related to halal business performance. In addition to that, the environment mediated the relationship between machine, people, and knowledge management towards halal business performance. This study hoped to contribute to an increased understanding of the systems' interactions in SME halal food manufacturers for business performance enhancement. It could contribute to the body of knowledge in business performance studies particularly on strategic management's research interest. The implications for practice in terms of offering the industry players to focus focusing on the key components system to enhance halal business performance.

Keywords: Halal business performance, small-and-medium enterprises, internal and external environments, halal market demand, government support, halal market

ABSTRAK

Produk halal semakin popular di seluruh dunia termasuk di Malaysia. Tren terkini menekankan prestasi perniagaan halal dalam pengeluaran makanan kecil dan sederhana. Tujuan kajian ini adalah untuk mengkaji interaksi sistem yang terdiri daripada mesin, manusia, dan pengurusan pengetahuan serta prestasi perniagaan halal perusahaan kecil sederhana (PKS) di Malaysia. Teori asas yang digunakan dalam kajian ini ialah Teori Sistem yang menekankan kepentingan interaksi pembolehubah utama iaitu mesin, manusia, dan pengurusan pengetahuan terhadap hasil perniagaan. Oleh itu, Teori Sistem menyokong rangka kerja penyelidikan. Persekitaran berfungsi sebagai pengantara antara pembolehubah utama dan prestasi perniagaan halal. Data dikumpul daripada responden dalam kalangan pengurusan tertinggi yang mewakili pengeluaran makanan halal PKS. Oleh itu, analisis unit dalam kajian ini adalah pengurusan tertinggi yang terdiri daripada terutamanya pemilik dan Ketua Pegawai Eksekutif syarikat. Langkah-langkah utama Partial Least Squares Structural Equation Modeling (PLS-SEM) telah dijalankan dengan sewajarnya apabila digunakan untuk analisis data. Penemuan utama menunjukkan pengurusan mesin dan pengetahuan mempunyai kaitan yang signifikan dengan prestasi perniagaan halal. Di samping itu, persekitaran menjadi pengantara hubungan antara mesin, manusia, dan pengurusan pengetahuan ke arah prestasi perniagaan halal. Kajian ini diharapkan dapat menyumbang kepada peningkatan pemahaman tentang interaksi sistem dalam pengeluaran makanan halal PKS untuk peningkatan prestasi perniagaan. Ia boleh menyumbang kepada bidang pengetahuan dalam kajian prestasi perniagaan terutamanya dalam penyelidikan pengurusan strategik. Implikasi amalan adalah menawarkan pemain industri untuk memberi tumpuan kepada komponen utama sistem untuk meningkatkan prestasi perniagaan halal..

Kata kunci: Prestasi perniagaan halal, perusahaan-kecil-sederhana, persekitaran dalaman dan luaran, permintaan pasaran halal, sokongan kerajaan, pasaran halal

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LIST OF ABBREVIATIONS

AVE	Average Variance Extracted
CMV	Common Method Variance
CR	Composite Reliability
DV	Dependent Variable
f^2	Effect Size for R ²
GMP	Good Manufacturing Practice
HACC	Hazard Analysis Critical Control Points
HFC	Halal Food Certificate
HIMP	Halal Industry Master Plan
HIDC	Halal Industry Development Corporation
HMS	Halal Management System
IHC	Internal Halal Committee
IoT	Internet of Things
IR4.0	Fourth Industrial Revolution
IT	Information Technology
JAKIM	Jabatan Kemajuan Islam Malaysia
MPG	Management & Profesional Groups
PLS-SEM	Partial Least Squares- Structural Equation Modeling
PM	Performance Management
q^2	Effect Size for Q ²
R ²	Coefficient of determination
SMEs	Small Medium Enterprises
ST	Systems Theory
TPB	Theory of Planned Behavior
TRA	Theory of Reasoned Action
TQM	Total Quality Management

CHAPTER ONE

INTRODUCTION

1.1 Background of Study

In this competitive business environment, corporate performance is critical. It's fascinating to see how companies seek more stability by being able to learn, adapt to changes, and manage market demand. Rapid developments in halal industries demand Small and Medium Enterprises (SMEs) capacity for halal compliance. As a basis, in the last thirty-seven years, Porter (1985) examined corporate performance in terms of maximizing profits. As a result, the company's production operations should become more efficient. Based on the systems approach, business performance could be achieved at the early stage of input-process-output (Ahmad et al., 2019) to measure operational effectiveness. The discussion on corporate performance has focused on financial and non-financial accomplishments that lead to business competitiveness, as expressed primarily in the strategic management literature (e.g., Porter 1985, 1991; Porter & Kramer, 2006; Wheelen & Hunger, 1995).

Even though the data about business performance from many industries were not consistent, Haffer (2017) provided a broad understanding that business performance is becoming a specialized type of competitiveness for a company to flourish. In addition to economic achievement, business performance emerges from a social systems approach, where it should perform to satisfy stakeholders, the social environment, and the social environment through social responsibility. As a result, previous studies debated the importance of meeting customers' expectations and keeping them satisfied (Bagorogoza & de Waal, 2010; Haleem

et al., 2019).

As a result, the research field of knowledge focuses on strategic management viewpoints, which businesses need to sustain and improve profitability efficiently. Strategy guides an organization's management decisions. Prominent authors on the strategy specified it as the overall plan for achieving an organization's mission and economic goals (David, 2007). While Sin and Tse (2000) conceptualized business performance as profitability, market performance, growth rate, and customer happiness in the business. On the other hand, looked at four aspects of corporate success: financial, marketing, production, and inventive performance (Hashim et al., 2018; Yuliansyah et al., 2017). In the context of this research, taking into account all the key aspects discussed in the previous studies, and engaging the customers' requirements is considered the pull strategy (e.g. Jia & Chaozhi, 2021).

Previous studies identified that business performance drivers might vary based on the size of industries, whether small, medium, or large. The majority of studies link strategic management to a set of knowledge that may help businesses become more competitive and profitable. Barrozo (2021) says that corporate performance can be measured in financial and non-financial measures, such as a commitment to improving customer happiness. Financial performance is the primary assessment to gauge firm performance in most scenarios, especially during a global economic slump. Therefore, it is essential for the company to critically measure the drivers for business performance enhancement, besides the policy, method, and procedure (David, 2007; Talib & Chin, 2018), that are uniquely captured in the systems. The current study employs strategic management viewpoints, including vision, mission, goals, and objectives that consider the

organization's internal and external contexts, as aligned with the Systems Theory.

In general, organizations in both large and SMEs continue to focus on gaining new consumers rather than retaining existing ones (Choi & Jeong, 2019; Salindal, 2019), and ensuring the high performance of the business. Customers' perceptions of organizations might be managed by maintaining system recognitions such as Good Manufacturing Practices (GMP) (Talib & Chin, 2018; Zin et al., 2013), Six-sigma (Azmi et al., 2018), Total Quality Management (TQM) (Azmi et al., 2018; Márquez-Gutiérrez et al., 2020), ISO 9000, and so on. Food manufacturers obtain ISO MS 15000 accreditation for Halal Quality Management Systems and Shariah compliance for their systems.

It has brought a lot of discussions on the actual scenario for halal-certified SMEs since their capacity to improve business success depends on the systems' interaction in a unique context (Azmi et al., 2018; Jia & Chaozhi, 2021; Márquez-Gutiérrez et al., 2020). The ability of the company to adjust the changes in the business environment, such as not only changes in client preferences and competitive pressures (Zainudin et al., 2016), but also the business's components (Azmi et al., 2018; Jia & Chaozhi, 2021). The Department of Statistics Malaysia (2020, 2021) stated the emerging trends, the number of SMEs in Malaysia increased from 1,113,157 in 2016 to 1,151,339 in 2021. Accordingly, SMEs in Malaysia contributed 38.2% of GDP in 2021 and 97.2 percent of total business growth in 2020 (<https://www.oecd-ilibrary.org/>). It is a growing interest in the halal food industry ecosystems as it contributes to the growth of the domestic and world economy. Figure 1 shows the trend of the halal food market for three main categories. The growing demand for consumption by other communities is a leading factor that is anticipated to fuel market growth over the forecast period. The global

halal food market is expected to reach USD 2.55 trillion by 2024.

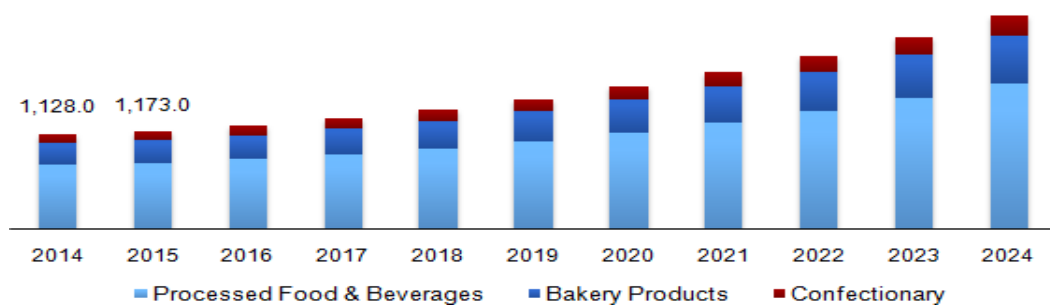


Figure 1.1
Global Halal Food Market Revenue
 Source: Statistica (2021)

The latest trend in the global halal food industry showed increasing demand from Muslim and non-Muslim consumers. Among the criteria for why halal food has higher demand is the assurance of hygiene, cleanliness, health, and well-being. Food safety is also essential for consumption that needs proper technology implementation, such as freshness and long shelf life. The Ministry of Health Malaysia (2019) reported the number of food poisoning cases in Malaysia went up by 24% in 2018 compared to 2017, which caused 36 deaths. WHO in 2019 also wrote that nearly one in ten people (an estimated 600 million) worldwide get sick yearly. At the same time, 420,000 died because of food contamination that produced bacteria, viruses, parasites, or chemical substances, which are detrimental to halal business performance at risk.

The halal food and beverages industry is the main contributor to the Malaysian halal economy with a total value of RM17.40 billion, followed by halal ingredients (RM8.83 billion), Cosmetics and Personal Care (RM2.67 billion), Palm Oil Derivatives (RM0.89 billion), Industrial Chemicals (RM0.47 billion) and Halal Pharmaceuticals (RM0.30 billion) in second to sixth respectively (Money Compass, 2021).

It is observed that Malaysia is heading towards a halal hub that is advantageous and not limited to the local halal industry, making it an ideal choice for businesses from other nations to access the global halal market. The already sizeable demand for halal products, 1.9 billion Muslims worldwide, approximating 24 percent of the global population – further increased by non-Muslim halal practitioners. The possibilities and breadth of halal products and services available to the business sector are equally significant. Halal products range from food and beverages, pharmaceuticals, personal care, cosmetics, and financial services. The Halal Industry Development Corporation (HDC) projects the global market of the halal industry to reach RM10 trillion by 2024. The Halal Industry Master Plan 2030 (HIMP, 2030) has been developed to provide structure and direct efforts at holistically growing our country's halal industry. This plan identifies 5 Super Catalytic large-scale transformative initiatives targeted at shifting the trajectory of the growth of the halal industry. The primary focus of HIMP 2030 is to promote the development, advancement, and internationalization of the local halal sector (MIDA, 2021).

There are significant opportunities and values in leveraging Malaysia's globally recognized halal certification. It gives manufacturers in other countries seeking a halal seal of approval and trusts to be attached to their products to ease and facilitate entry into new untapped markets. Applying Malaysia's halal certificate to international manufacturers' products will further increase Malaysia's international profile and reinforce our country's position at the forefront of the global halal ecosystem. Through the untiring efforts of HDC, Malaysia has emerged at the forefront of the international Halal fraternity. A principal component in promoting the halal industry to the world is our country's Halal

certification, widely held as the gold standard across the Islamic world (MIHAS, 2019).

Malaysia's government has urged Small and Medium Enterprises (SMEs) to embark more on research and development, especially in technology, and explore new growth areas in the digital economy in the Fourth Industrial Revolution (IR4.0) for more sustainable growth (Cooper, 2017). Among the critical strategic interventions under the 12th Malaysia Plan (12MP) is to boost economic growth by enhancing the competitiveness of the halal industry to capture a larger share of the global halal market. Economic growth will increase the demand for halal products, enabling new opportunities for more halal entrepreneurs to participate in the industry (SMECorp, 2021).

Malaysia is a good mover in the Islamic/halal economy and promotes itself as a global halal hub. As the halal hub business grows in popularity among all customers, halal food manufacturers, particularly SMEs, are seizing the chance to expand the halal industry in Malaysia. SMEs can boost the country's competitive edge to tap into the halal developing sectors since they play an essential role in its economic development, particularly in the halal food business. Therefore, it is the right time for Malaysia to focus on halal entrepreneurs and sustainable innovation. In line with that, The Ministry of Entrepreneur Development (MED) in Malaysia targets to produce a million SME entrepreneurs in the next five years (2019-2023). It prepared an entrepreneurship framework that involves various stakeholders and entrepreneurs through the Bumiputera Entrepreneur Congress, which MED in the different states has organized. Thus, the developed framework consisted of 21 strategic objectives grouped into four strategic thrusts: Accelerating Economic Growth through Innovation Driven Entrepreneurship. The Global Entrepreneurship

Monitor report confirmed that Opportunity drives most entrepreneurs in every economy. Many entrepreneurs strive to improve their lives through better income or more independence in their work.

In addition, Malaysia can expand its market to global markets as SMEs, international companies' brands and well-known multinational giants manufacture a wide range of food products. This international market is proven by a report from the Ministry of Economic Affairs,eleventh (11th) Malaysian Plan (2016-2020), has value added for SMEs to moderate growth of 6.2% per annum during the review period, which remained below the targeted rate of 9.3% in the Eleventh Plan. However, the value-added growth of SMEs exceeded the GDP growth of 5.1%, mainly driven by wholesale and retail trade, food and beverages, rubber, oil palm, and livestock subsectors. Regarding exports, SMEs contributed 17.3% in 2017, which is on track to achieve the target of 23% by 2020. Meanwhile, SMEs in Malaysia contributed 13.5 percent of overall exports in 2020, with 9.4 percent coming from the manufacturing sector, 3.9 percent from the services sector, and 0.3 percent from agriculture (Department of Statistics, 2020). SMEs' exports of vegetables, fisheries, poultry, bananas, and durian have increased recently, resulting in growth in the farm industry. Malaysia focuses on China, Singapore, and Hong Kong as its primary export destinations.

These SMEs are unable to accomplish effective performance as a result of performance issues, which has an impact on their overall performance. Because SMEs constitute the backbone of the economy in many nations, a drop in SME performance harms their influence on the country's economic growth. For the most part, Malaysian SMEs have made significant contributions to the economy. As a result, it is critical to propose various methods or models for long-term business

success. Because performance is one of the most complex procedures, it necessitates a comprehensive plan. Halal food management in the halal food sector is compelling. It is influenced by external variables such as consumers and governments and the organization's effective and competent internal management. Strategic vision alignment is critical in determining an organization's halal performance.

Management is viewed in this light as an operational process that creates products and services. It is responsible for planning, coordinating, and controlling the resources required to produce an organization's goods and services (Barrozo, 2021). Because they affect and are greatly affected by the investment firm's movements, business strategy, and other internal and external elements that influence the firm's business performance.

Halal should be considered as a whole, not just a result of the 'halal' brand. It results from strategic management, particularly concerning internal and external control interaction. Muslims feel that the notion of halal cannot be entirely captured inside the product construct. Instead, halal extends well beyond corporate management, organizational behavior, cultural anthropology, and sociology (Arif et al., 2019; Razak et al., 2019). Halal is a part of Muslims' Islamic beliefs and values, not just a brand.

The rapid development of halal industries necessitates early planning, long-term implementation of procedures, and a strong commitment among the organization's employees. However, to persuade customers, businesses must secure the necessary halal certification. It is possible to examine the effects of halal certification on different types of companies, to obtain the pure significant consequences of halal certification (Salindal, 2019).

Halal's strict methodology has helped customers in many industries, including food, food processing, pharmaceuticals, cosmetics, healthcare, packaging, logistics, banking and finance, packaging machines, tourism, and others in the Halal ecosystem. Undoubtedly, food companies have begun to implement Halal Food Certificate (HFC) on a global scale, such as the case with International food companies like McDonald's and Nestlé, which have extensively implemented and introduced halal certification into their operations and productions (Fischer, 2016), and further related to the systems' interactions (Ali et al., 2021; Jia & Chaozhi, 2021). To adopt halal as a way of life, Malaysia External Trade Development Corporation (MTDC) urges practitioners to apply the absolute principles of *Halalan Toyyiban* in their services (MTDC, 2021).

Halal is very important for Muslims when choosing and buying food or product. Following Islamic instructions, Muslims are supposed to use halal foods and be healthy. Hence, it is unavoidable that the demand for halal products, especially food products, will increase in tandem with the growth of the Muslim population worldwide. In the Holy Quran, the difference between halal and haram is clearly stated, meaning this:

“Those who follow the messenger, the unlettered prophet, whom they find written in what they have of the Torah and the Gospel, who enjoins upon them what is right and forbids them what is wrong and makes lawful for them the good things and prohibits for them the evil and relieves them of their burden and the shackles which were upon them. So, they who have believed in him, honored him, supported him and followed the light which was sent down with him - it is those who will be successful.” (Al-A'raf [7]: 157).

Other than sources from Al-Quran, Malaysia has a statute to regulate the halal industry in Malaysia. The Trade Descriptions (Definition of Halal) Order 2011 is legislated under section 28 of the Trade Description Act 2011, which states that food or goods described as halal must be safe for Muslims to consume or use (Miskam et al., 2015), in every aspect in life including food (Al-Ansi & Han, 2019; Haleem et al., 2019).

Before this, the halal concept is not unfamiliar to non-Muslims, especially those in Muslim countries. The latest trend in the global business market is the halal industry; the demand for halal products is increasing due to the request by both Muslim and non-Muslim consumers. Not only are Muslims indebted to halal products, but non-Muslims are attentive to them as well. This has sparked intriguing discussions. Nowadays, halal applies not only to Muslims but also to non-Muslims; instead, halal products have become well known globally and emphasize the need for a halal value chain to accommodate the demands for halal foods by non-Muslims.

The Wuhan Municipal Health Commission (WMHC) in Wuhan City, Hubei Province, China (WMHC, 2021), reported a cluster of pneumonia cases with a commonly reported relation to Wuhan's Huanan Seafood Wholesale Market on December 31, 2019. It was a wholesale fish and live animal market selling different animal species. One element contributing to this problem is food safety, which occurs when Wuhan residents consume exotic animals without adhering to hygienic regulations. Food security is also very essential from an Islamic standpoint. This assertion is clear when Muslims are taught to eat food that is in harmony with their bodies. To enhance food safety, the food industry requires halal as a requirement.

Regarding Al-Quran, foods are meant to be eaten without causing harm, allergies, or cause any diseases. This is in line with the practice of the Prophet Muhammad, who loved nourishing and nutritious foods. If he does not have the desire to do something, he will not force himself to touch it. In addition, there are Allah's words and the Prophet's hadith to show the prohibition of self-destruction for every act that brings harm and danger to one must not be on the side of Islam, mentioned in this word:

“And spend in the way of Allah and do not throw (yourselves) with your (own) hands into destruction (by refraining). And do good; indeed, Allah loves the doers of goods” (Surah al- Baqarah 2:195).

Alongside WMHC (2021), a few years back Krishnan et al. (2017), highlighted food safety is paramount. It influences non-Muslim purchasing behavior, which is also an indicator of the hygiene and cleanliness needed to maintain their health. Non-Muslims should have some knowledge of halal cuisine to improve their knowledge, which could be a consequence of a better understanding of the elements that impact non-Muslims' purchasing decisions to prefer halal products in their daily lives (Haleem et al., 2019).

For Muslims, the halal mark on food packaging has been a good indicator of permissible food rendering to their religion. Their inclination to buy a specific type of food is influenced positively by their Halal understanding and certification (Arif et al., 2019; Razak et al., 2019). In Muslim-majority nations like Malaysia, products with the Halal mark attract more customers. It is a standard guideline developed to safeguard halal food's safety, purity, and integrity, whether it be Muslim food or ritually slaughtered meat. Furthermore, the Malaysian halal food

business prioritizes safety and quality while adhering to halal principles and maintaining halal integrity. Without the strategies and evaluation of performance measurement with the system's interactions, the halal company in Malaysia is absurd to succeed, especially for SMEs that create halal products to satisfy consumer satisfaction.

Notify that once an SME obtains a halal certificate from an authorized body such as JAKIM, the SME has already met all halal requirements; however, they are required to maintain the certification to ensure compliance (e.g. Haleem et al., 2019; Rakhmawati et al., 2019). Therefore, SMEs will most likely enhance their business performance in the halal food industry. Like most halal firms, SMEs have relatively few resources, especially finance, employees, and knowledge (Muhamed et al., 2020). In this view, SMEs must adopt halal implementation for sustainable business performance and comply with the Shariah law regarding their halal product status.

There are still anomalies in the performance management system for food manufacturers to establish a halal system for their products and obtain competitive benefits. As a result, the organization must devise a proper strategy for production processes. Managers can use the method to determine the effectiveness of the halal system that the company has adopted (Arif et al., 2019; Muhammad et al., 2020). SMEs have several flaws, including a lack of workers, a lack of financial assistance, a lack of educational background, and a lack of competence and a professional management team. Governments are always making considerable efforts to improve the development of SMEs (Al Dhaafri et al., 2016; Jia & Chaozhi, 2021).

There are still unfilled voids in the systems' interactions, as the SMEs need a system that generates a performance measurement to aid businesses in carrying out their distinctive plan to implement the halal system on their products to satisfy customer demands in sectors like the halal market (de Araújo, 2019; Haleem et al., 2019). Halal Management System (HMS) is one of the most important factors for SMEs to implement the Shariah-compliant process in producing halal products. Failure to comply with HMS has resulted in various concerns, such as halal product makers' integrity, which has disrupted the halal business. This argument can be supported by the fact that previously, in halal performance, the focus has always been on the product's output, such as logo and brand. Still, the halal business has been disrupted due to halal product manufacturers' integrity issues.

The issue of animal feed from non-Muslim suppliers, where the material used for the food is doubtful, is one of the concerns concerning SMEs, such as Kedah SMEs that offer raw meat. Buyers don't want meat from questionable suppliers, so their business performance suffers. Rizal Nainy, the CEO of SMECorp, presented SMEs that have financing problems such as access to financing and start-ups due mainly to inadequate cash flow to meet repayment obligations. SMEs and start-ups are also facing issues with complex application processes, insufficient collateral and documentation, and high risks related to business ventures. More than 70% of SMEs' financing needs are sourced internally or from personal savings, and only about 30% are obtained from banks, development finance, and microcredit institutions (SMECorp, 2021). As for the budget 2021/2022, the Ministry of Finance (MoF) stated the country should prioritize and assist all sectors, including SMEs. In 2021, Malaysia's GDP was between three to four percent, with a Global economic growth of 5.9%, and in 2022

continue to improve (IMF, 2021). In addition, SMEs use technology sparingly because they conduct insufficient research, lack simple access to talent pools, and lack sufficient funds for strategic planning and technology implementation. (Ying, 2019).

This research defines Halal business performance as a measure of how the company fulfills the standard requirements for HMS, as stated in the MS1500:2019. This HMS can be identified by examining the business performance concerning the financial and non-financial aspects such as cost, productivity, quality, employee, customer loyalty, legislative compliance, production process, business sustainability, market share, and brand image (Nugraha et al., 2022; Perdani et al., 2018). These preparations are intended to ensure a more comprehensive halal management implementation and serve as a benchmark for good industrial practice. Recent research has also highlighted how financial and non-financial measures may be defined using internal and external standards (Panno, 2020). Also, the study by Giyanti et al. (2020a) found that implementing HMS is a guide for SMEs, especially top management, in adopting halal food standards in their production.

1.2 Problem Statement

The concept that business strategy is correlated to organizational business performance has been confirmed in the literature (e.g., Köbnick et al., 2020). Competitiveness in business performance issues and the best strategies to market the quality of final goods have long been a topic of discussion at the international level in the halal industry. Hashim et al. (2015) found that firms must develop and implement business strategies that fit with their business environment for them to support their

organizational business performance. Shamimul et al. (2017) argue that firm performance is an outcome that reflects a firm's success in fulfilling its business goals. Amroune (2016) said that SMEs must understand what leads to improved performance. Business performance is the main consideration in investigating organizational phenomena, while performance improvement is a concern of strategic management and business strategy that required innovation (Köbnick et al., 2020. Matanda et al. (2016) used firm performance as a dependent variable.

All companies regardless of different forms (financial institutions, small manufacturers, support providers, professional services, distributors, and countless others) need to know the level of their performance (Negi, 2020; Perdani et al., 2018). Concerning this, SMEs are anticipated to upgrade their performance, especially in developing and emerging countries context (Amroune, 2016; Ramadan & Ahmad, 2018). In this study model business performance of SMEs is a dependent variable that is measured by Systems Theory (people, machine, and knowledge management) as independent variables and the environment as a mediator variable. The theory consisted of components in the system's interactions used to fill the gaps in SMEs' halal business performance in the context of Malaysia.

Despite this, little empirical research has studied SMEs' business performance in the halal food industry. Currently, there is still a lack of validated and solid empirical findings for SMEs on halal business performance. This is because SMEs are constantly facing these problems and facing widespread criticism from consumers (Talib & Chin, 2018; Boukerika et al., 2019). Without denying, halal food products have become progressively popular among consumers globally, as the idea of halal is related to good, healthy, safe, and high-quality assessment. However, some SMEs have little knowledge of the aspects that could improve their business performance

significantly.

Generally, SMEs encounter numerous hurdles and challenges in gaining competitive advantages, notably in Malaysia's food manufacturing industry. Hence, past researchers have frequently mentioned funding or financial constraints as critical issues that need to be addressed for SMEs to grow and thrive (Shuhada et al., 2018; Fard & Amiri, 2018). Previously, Tehseen et al. (2015) found that Malaysian SMEs are still losing their competitive advantage in the global business environment due to their low productivity and poor performance. In continuation, Salam et al. (2017), argued that commercial enterprises' continuity and sustainable business enterprise performances are going to be competitive.

The low in business performance may cause by the low readiness and support among top management and employees. The concept of top management support has been studied by many scholars and unarguably it is known as one of the most important components in the halal performance of companies that sometimes being neglected (Muhammed et al., 2020; Perdani et al., 2018). Top management still lacks confidence in implementing halal because they do not have sufficient knowledge to obtain halal to increase business performance. Many SMEs could not cope with halal guarantees in supply chain management without top management support, commitment, credibility, and compatibility. They are gaining a halal certificate essential for SMEs and business producers to ensure halal from a religious view. It is also to ensure food safety and good food quality while at the same time helping them to increase their business performance (Kirchoff et al., 2016). Therefore, it should come as expected that the support from top management has a repercussion in defining performance in halal SMEs (Muhammed et al., 2020).

Besides that, one of the factors that influence SMEs' business performance is machines. The machine term in Systems Theory remains as the technology and innovation. Like technology, based on research from Lo et al. (2016) if the firm failed to adopt the advanced technology to customers' benefit, the business performance of the firm could not happen. Therefore, any high-technology adaptation should align with high organizational performance. The application of new technology, such as using machines within an SME food manufacturer, had been widely discussed (Giyanti et al., 2020b; Soltanian et al., 2016). Nevertheless, SMEs were not able to deal with it very successfully. Proper equipment is also crucial for Malaysian SMEs to overcome technology and innovation obstacles in the global halal market.

Halal food industry problems are also related to manufacturers' knowledge of halal standards implementation. In addition, the lack of knowledge management among SMEs inhibits their implementation of HMS (Azmi et al., 2018), and lack of halal integrity in production (Haleem et al., 2019). To get higher business performance, the mitigation knowledge particularly on the halal knowledge, finance, and quality of halal productions should be adopted as a strategic orientation for better performance questioning the lack of understanding of the halal concept among businesses as one factor contributing to halal business performance issues. Hence, the SMEs' primary challenge is understanding the halal concept and standards. Without knowledge of halal principles, concepts, and standards, SMEs would not be able to pertinent produce halal food. Among SMEs, knowledge management needs to be practiced to increase business performance, in which all the staff understands the production based on allowed and permissible consumption (Kirchoff et.al, 2016; Nawati et al., 2022). The knowledge is intriguing

to investigate because Nawi et al. (2022) discovered that knowledge failed to foresee the commitment of food industry firms to Halal standards. Predominantly, halal-related research conducted in Malaysia by Mostafa (2020) concerns on the halal compliance of halal food production in Malaysia. The deviations of compliance to Halal Assurance System (HAS) are because of the lacking of government support, hence government supports plays an essential role in assisting SMEs (Veronica et al., 2020), particularly in the halal and hazard and critical control point systems.

Global market demand could drive the SMEs to effectively produce halal in line with halal requirements and standards. Little is known about how the market demand could determine the competitive advantage of halal food manufacturers towards meeting customers' demand and becoming better in competition (Hashim et al., 2018; Yuliansyah et al., 2017). Hence, the study bridges the gaps in understanding the connection of market demand on business performance.

The lack of the system's component leads to the lack of halal integrity, which makes SMEs commit to using non-halal product ingredients, non-segregation between halal and non-halal foodstorage, and slaughtering issues. It is worth noting that once SME gets a halal certificate from JAKIM, the SME already fulfills halal requirements, therefore most likely enhances their business performance.

Bridging the gaps in the previous studies, Systems Theory comprehends all the components of SMEs (Haffer, 2017), both internal and external factors (Panno, 2020), including skills and expertise (Li et al., 2020). Understanding how these variables interact is crucial to understanding how and why this system works. This Systems Theory can assist SMEs assess the effect of these variables, which can

quantify halal business performance.

1.3 Research Questions

Generally, the research questions investigate the effect of the systems' interactions (machine, people, knowledge management, and environment) on SMEs' business performance. Hence, specific research questions were developed while conducting the research:

RQ₁: To what extent does the machine affect the halal business performance of SMEs?

RQ₂: In what way do the effects exist between people and the halal business performance of SMEs?

RQ₃: To what extent does knowledge management affect the halal business performance of SMEs?

RQ₄: Does the environment (government support and halal market demand) mediate the effects of machine, people, and knowledge management on the halal business performance of SMEs?

1.4 Research Objectives

The overarching objective of this study is to determine the effect of machine, people, and knowledge management on halal business performance among SMEs, with the environment serving as a mediator. The systems' interaction of these three (3) variables would affect SMEs' performance in the halal food industry. The specific objectives are as below:

RO₁: To examine the effect of machine (technology and innovation) on halal business performance SMEs.

RO₂: To examine the effect of people (top management and organizational

readiness) on halal business performance among SMEs.

RO₃: To examine the effect of knowledge management (understanding, awareness, and integrity) on halal business performance among SMEs.

RO₄: To examine the environment (government support and halal market demand) in mediating the effect of machine, people, and knowledge management on halal business performance among SMEs.

1.5 Scope of the Study

This study is centered on the interaction of machines (technology and innovation), people (top management and organizational readiness), environment (government support and halal market demand), and knowledge management (understanding, awareness, and integrity) on halal business performance among SME food manufacturers. The study narrowed down to the halal food manufacturers registered under JAKIM, 2020. The study focuses on SMEs in Malaysia, represented by middle-level and top-level management. It was designed to assess people in charge of putting strategy into action rather than those in charge of formulating it. Both levels are essential since their knowledge allows them to become team leaders, and responsible for business performance.

This study employed the quantitative research approach and data were collected using a survey questionnaire. The survey instrument consisted of five primary sections, specifically, machine (technology and innovation), people (top management and organizational readiness), environment (government support and halal market demand), knowledge management (understanding, awareness, and integrity), and halal business performance (Appendix A).

1.6 Significance of Study

The study is important because the emerging trend in the literature review stressed the gaps of knowledge of the halal ecosystems and less work on the SME context. The study would contribute to the new knowledge about interaction on the systems theory in a holistic manner by looking into the elements of the machine (technology and innovation), people (top management and organizational readiness), environment (government support and halal market demand), and knowledge management. Business performance especially halal business performance would contribute to the body of knowledge of the SMEs' context for the competitiveness of the halal business environment. While this framework of the study is to support the SMEs in their definition of halal business performance. Other than that, the study is important to contribute to the SMEs as a whole for business performance and sustainability. Whilst, the practitioners could have a better understanding of the applications of elements for halal performance increment. Finally, it is hoped that the research findings can help the sustainability of SMEs' food manufacturers' strategy regarding halal business performance. This study was also intended to assist SME food manufacturers with competitive advantages in the halal food industry.

1.7 Definition of Key Terms

The present study examines the relationship and interaction between machine, person, and knowledge management in SMEs' performance, especially on their business performance mediated by the environment. The definitions of the main terms are elaborated as follows:

1.7.1 Business Performance

Performance is a measure of organizational performance by the organization's internal halal committee on halal management. Business performance is related to financial and non-financial such as cost, productivity, quality, employee, customer loyalty, legislative compliance, production process, business sustainability, market share, and brand image. (Fadhlur et.al., 2018).

1.7.2 Technology

Technology is the extent to which practitioners believed that technology would assist them in influencing their business, particularly in terms of sales growth and conformance with the halal standard. Technological expansion within the food system most obviously contributes to the economic effectiveness of the system, mainly through a reduction in product costs and the adaptation of products to consumer criteria (Ngah et al., 2019).

1.7.3 Innovation

Innovation improves business performance because the product of innovative activities makes a firm more competitive, and the process of invention transforms a firm's internal capabilities, either as a process or an outcome, which influences the firm's performance. Innovation has substantial effects on the food system, such as passing materials more rapidly through the food supply chain, diminishing the impacts of distance for the sourcing of materials, and impacting the structure and diversity of the food system. These effects have important implications for the sustainability of the food system. An interesting aspect of innovation is its capacity to participate in reforming the current food system (Bhuiyan et al., 2016a,b).

1.7.4 Top Management

Top management commitment in terms of providing adequate support, training, and education, as well as empowering personnel. Besides, disseminating information and knowledge, implementing halal policies and procedures, and focusing on consumer demand. As these factors can have an impact on organizational performance, SMEs must pay close attention to them (Indrasari et al., 2020). Aligned with Fadhlur et.al. (2018) stated the importance to realign and comply with halal standards.

1.7.5 Organizational Readiness

Organizational readiness degree is the capacity of the top management to adopt HMS and the number of employees who comprehend and comply with halal standard operations. Ngah et al. (2019) described organizational readiness, namely the functionality of the operation management to adopt new technologies, adopt innovations, understand the operations for halal standards, and understand halal system documentation and record.

1.7.6 Government Support

Government support can be gauged by their roles in assuring the halal food industry, which includes planning, developing, implementing, regulating, promoting, and educating SMEs and halal industrial players in the halal market (Zulfakar et al., 2014). Hence, government support relates to government policies, regulations, and agencies such as grants, finance, training, conference, information, and infrastructure (Othman et al., 2017).

1.7.7 Halal Market Demand

Halal market demand is the needs and desires deriving from consumer and community pressures in the halal industry. It was dominant in influencing the business performance in Malaysia context (Jayakrishnan et al., 2018). Manufacturers are to determine the specific standard; hence, the manufacturers have to constantly update various certifications as leading organizations for halal standardization and accreditation have been taking steps to harmonize the standards.

1.7.8 Knowledge Management

Knowledge management is about halal executives among SMEs company are found to implement the HMS based on their basic knowledge and skills, general knowledge of Islam, and knowledge and experience in managing food premises (Nusran et al., 2018). In this regard, it can be implied that the halal executives implement the HMS based on their spiritual knowledge of Islam. Knowledge is the best driving force for entrepreneurial and organizational performance, and knowledge, awareness, and understanding of the halal concept can influence business performance (Zaim et al., 2019).

1.8 Organization of Thesis

This chapter discusses the background of the study, Chapter Two presents the literature review on business performance in halal food SMEs, theories, and the multiple constructs being used for this study. It explains the theoretical framework and the proposed hypothesis. Chapter Three presents the research methodology, measurement instruments, and data analysis processes. Chapter Four presents the result of the instrument model, data characteristics, predictive validity, tested

hypotheses, and PLS-SEM results. Chapter Five summarizes the findings concerning the research objectives, and discusses the results, offers implications of the research, limitations, and recommendations for future research.



CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews the extant literature to offer clear insight into the field of study. The chapter critically addresses the issues of the study as in the problem statement in the previous chapter. The Systems Theory has been identified as the underpinning theory that supports the research framework and development of the hypotheses. Based on the Systems Theory, this study examines the system's interactions that exist between the three measured variables and a mediator effect. It offers the conceptual development of the key variables namely machine (technology and innovation), people (top management and organizational readiness), knowledge management (understanding, awareness, and integrity), environment (government support and halal market demand) as a mediator, and halal business performance.

2.2 Strategic Perspectives on Business Performance

A strategy could assist the halal food industry to enhance its business performance by gaining competitive advantages (Talib et al., 2016). From the strategic management view point, the business should embrace halal principles in each process and activity's input-process-output, Shariah, and regulatory compliance. This needs people, processes, and technology in the integrated systems of food manufacturing. Moreover, the food industry requires people who know (understand) and awareness to ensure the business performance is at par. Besides, the top management supports and commits to halal systems implementation to

ensure the business succeeds. In terms of external factors, the government support environment would influence the business performance. Likewise, the market demand for halal products also influences business performance.

Organizational readiness and integrity systems moderate the effect of people, technology, and the environment toward better business performance (Fadhlur et al., 2018). Integrity related to halal consumption by consumers would upsurge the business performance. The integrity element has been discussed by (Talib et al., 2019), and most manufacturers pursue Halal principles in their operations to achieve better performance. These factors appear in the halal systems that consisted of many manufacturers, besides it becoming the weapon for the companies to become sustainable in the business competition. Hence, the current research argues the factors surrounding the strategic pressures for business performance in the context of halal industry ecosystems.

Business performance in the halal food industry is a measure of organizational performance by the organization's internal halal committee on halal management. This measurement method is divided into two measurements that are financial and non-financial. For example, from financial aspects like profitability, sales volume increase, market abroad, product development, and new market. Then, from the other side, non-financial such as safety, quality, product process, customer satisfaction and loyalty, brand name, or brand image. Baharuddin and Ismail (2018) revealed many researchers and empirical studies have shown that implementing certification has a relationship with performance not only regard to financial performance such as sales, and marketshare, but it is also on non-financial performance such as quality, time, and brand image.

This also can be determined by examining the organizational operating performance based on cost, productivity, quality, employee, customer loyalty, legislative compliance, production process, business sustainability, market share, and brand image. These preparations are intended to ensure a more comprehensive implementation of halal management and to serve as a benchmark for good halal industrial practice.

In reality, performance effectiveness for halal food management in the industry; is not only influenced by external factors such as consumers and government but also by an effective and competent internal management of the organization which is very important in measuring an organization's halal business performance. In this regard, top management is seen as an operational process that produces goods and services and is responsible for the planning, coordination, and control of the resources needed for the production of goods or services within an organization (Muhammed et al., 2020). Vranakis and Chatzoglou (2011, 2014) also mention business strategy and other internal and external factors influencing the firm's business performance since they affect and are significantly affected by investment firm movements.

The internal process is one of the important parts for halal food manufacturers to prove that they can perform in the halal industry. Internal processes in the organization are a development working towards satisfying the process set out in the Malaysian halal certification application (Baharuddin & Ismail, 2018). It incorporates the documentation and the record required by SMEs that needs to obtain halal. SMEs need a special record for the application of halal the internal process consists of two dimensions that are documentation and process.

Top management plays a vital role in this matter to ensure that the firm can comply with HMS for the whole firm's operation as a measure of halal sustainability. Top management is also ready to adopt new technology and innovation to increase company sales. Şahin and Topal (2016, 2018) mentioned developments in technologies and innovations bring about a change in business activities and performance. The importance of using technology can be seen as implementing of latest technological equipment or innovative processes which lead to achieving higher profit, higher productivity, greater activity outcomes, reduced costs, improved quality, gaining competitive advantage, market share, and improve firm performance at the sametime. This is important for SMEs to maintain their halal business performance. Other than that, external factors like government and consumers influence halal business performance. This statement is proven by Adha et al. (2017), in their research, they mention the robust industry in the manufacturing and marketing sectors of halal products, strong relationships with major trading nations in the world, and support from the government.

Azam and Abdullah (2020) agreed that halal should be viewed as a whole and not only dependent on the 'Halal' brand but also on strategic management, especially in relation and interaction between internal management and external of the organization itself such as government support, halal market demand, etc. The halal concept has received increasing attention because the demand for halal food is growing every year as a result of the increase in the Muslim population worldwide and also to sustainability (Mohamed et al., 2020). This should be promoted by encouraging non-Muslims to socially interact with Muslims as well as supporting other factors that might improve non-Muslims' understanding and familiarity with halal principles.

However, there are still industries that are not in line with the rapid development of halal which requires early planning, and sustainable implementation of halal procedures accompanied by a strong commitment among the people of the organization. This statement is supported by the study from Soon et al. (2017) who determined the term halal refers to food that covers all the aspects starting from the farm and ending at the table of a halal-observant home. This means that halal food starts with sourcing various permitted raw materials and preparing them accordingly (such as proper halal slaughter and no cross-contamination with haram products). During all stages of halal production, the food must be sourced lawfully, such as free from corruption, dishonesty, and with no malicious intent.

Thus, for a halal food manufacturer to maintain halal business performance by assuring customers that the firm's halal products are not just halal in the logo but are halal products from the manufacturing of products that are guaranteed halal for consumers. This concept requires a high degree of interdependence by the manufacturers to maintain a halal status so as not to tarnish the company's name while affecting business performance.

2.3 SME Business Performance

SMEs have played an increasingly important role in Malaysia since the late 1990s. The income of SMEs is one of the sources that meet the household's income, which indirectly contributes to the increase of economic growth as a mirror of the capacity of goods and services' production flow (Rekarti & Doktoralina, 2017). The importance of SMEs to the Malaysian economy since the establishment of the National SME Development Council (NSDC) in 2004 (Chin & Lim, 2018). The SME Masterplan aims to help SMEs grow beyond the domestic market and

emphasizes innovations and new technology as strategies for the growth and development of SMEs.

SME master plan gives a much more detailed analysis of SMEs by providing an impact assessment of SME Development Programs, developing a new SME development framework, identifying forces that drive SME performance, and suggesting action plans to accelerate growth for SMEs. The identified six forces that drive SME performance concerning the level of importance in the SME master plan are (1) innovation and technology adoption; (2) human capital development; (3) access to financing; (4) market access; (5) legal and regulatory environment; and (6) infrastructure (Chin & Lim, 2018). This means that by successfully addressing these constraints with the implementation of the six-high impact programs under the master plan, SMEs will perform well.

Figure 2.1 shows that based on the time series of Malaysia's GDP and SMEs' GDP, the growth of SMEs' GDP is usually higher than Malaysia's GDP. However, in 2020, the growth of SMEs' GDP registered at negative 7.3 percent, which was lower than Malaysia's GDP for the first time in the past 17 years since 2003.

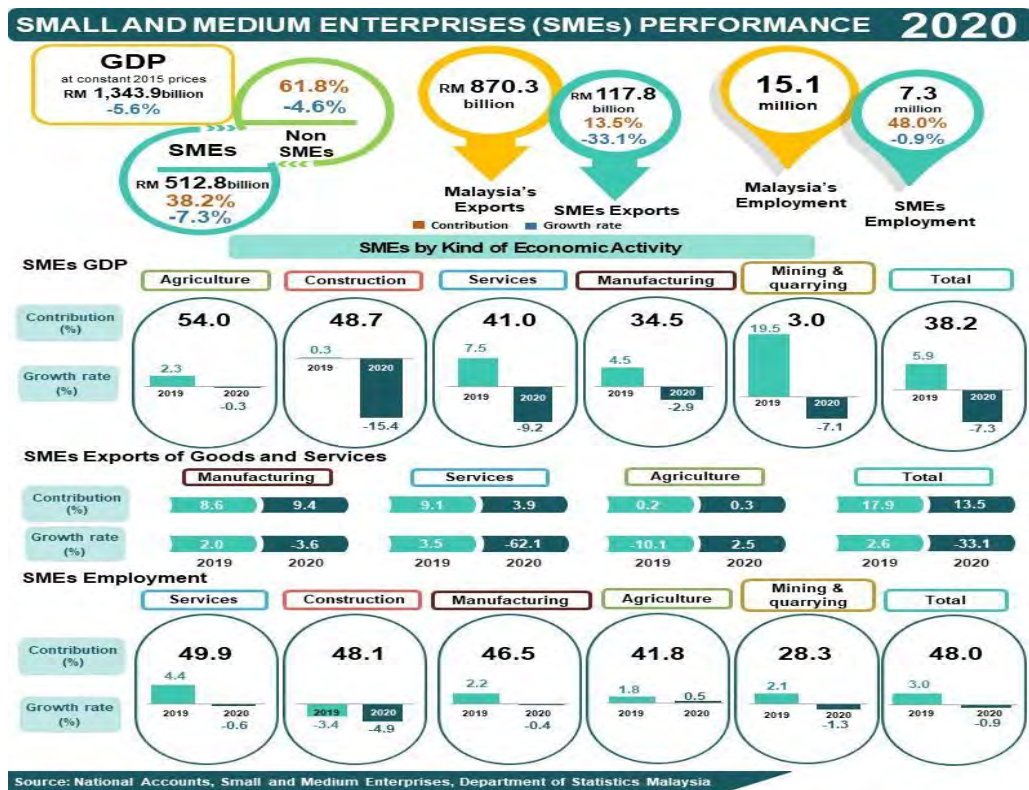


Figure 2.1 Small Medium Enterprises (SMEs) Performance

Figure 2.1

SMEs Performance

Source: Department of Statistics Malaysia Official (2020)

The contribution of SMEs' GDP eased to 38.2 percent in 2020 with a value-added of RM512.8 billion as against 38.9 percent (value added: RM553.5 billion) in the preceding year. The services and manufacturing sectors remained the main drivers of SMEs' GDP activities and both sectors represent more than 80 percent of SMEs GDP. According to data from the World Bank (2022), SMEs account for around 90% of all businesses and more than 50% of all employment worldwide. SMEs contribute up to forty percent of the GDP. Thus, the SME Bank projects that the economy will grow between 4% and 5% in 2023.

Its performance example often evaluates the performance of SMEs by examining their contribution to output and employment, their productivity, and their performance in innovation activity (Chin & Lim, 2018). Kijkasiwat and Phuensane (2020), argued that three indicators to measure SMEs' performance, like

innovation, and financial capacity, influence firm performance. Other scholars, Panno (2020) and Carlyle (2015) have analyzed the measurement in evaluating business performance among SMEs by indicators like profit, return on investment (ROI), turnover or number of customers, design quality, and product improvement. Thus, Zulkiffli and Perera (2012) recommend measuring SMEs' business performance through the business performance measurement system, as it is operational business performance and strategic business performance. Kafetzopoulos (2020), identified SME performance to measure the internal and external of the company. The results of a systematic literature review of the fifty-eight selected studies are represented in a conceptual model. The studies were thoroughly examined for antecedents, SME performance, and arbitrators of the antecedents–performance relationships.

Table 2.1
Arbitrators of SMEs' Performance Moderators of SMEs' performance

Factors	Relationship	Sources
Internal arbitrators of SMEs' performance		
Internal rivalry	Moderates the relationship between contextual ambidexterity and SMEs performance. - Internal systems	De Clercq et al. (2014)
Organizational culture	Moderates the relationship between trust in business social responsibility and firm performance. - Internal systems	Gorondutse and Hilman (2019)
Network competence	Moderates the relationship between institutional environment and internal performance. - Internal systems	Torkkeli et al. (2019)
Market orientation	Arbitrates the relationship between dynamic capabilities and firm performance. - Internal and external systems	Hernandez-Linares et al. (2020)
External arbitrates of SMEs performance		

continued;

External rivalry	Arbitrates the relationship between contextual ambidexterity and SMEs performance. - External systems	De Clercq et al. (2014)
Environment dynamism	i. Arbitrates the relationship between innovation ambidexterity and firm performance. ii. Arbitrates the relationship between technology commercialization and firm performance. iii. Arbitrates the relationship between innovative work behavior and firm performance. iv. Arbitrates the relationship between successful innovative output and firm performance. - External systems	Omri (2015), Park and Ryu (2015), Soto-Acosta et al. (2018)
Consumer attitude dynamism	Arbitrates the relationship between technological capability and firm growth - External systems	Poudel et al. (2019)
Internal expansion	Arbitrates the relationship between innovativeness and firm performance - Internal systems	Jun et al. (2020)

Source: Adapted from Kafetzopoulos (2020)

The previous study offers inconsistency about SME performance for manufacturing factors affecting the performance of the SMEs in the manufacturing industry to expand the knowledge regarding the factors affecting SME performance and their mutual connections. Also, SMEs need to demonstrate a high degree of innovation in designing strategies and organizational practices as well as coordinating with the conditions of the external environment to gain a competitive advantage in this industry. For instance, the entrepreneurs of SMEs need to have the innovative skill to tackle unpredictable circumstances or conduct things differently (Moorthy et al., 2012; Yanes-Estévez et al., 2018).

A comprehensive understanding of the holistic concept of SME performance must be measured by harnessing the potential of IR4.0, which provides new product development, innovation, increased business performance, and wealth creation opportunities. Hence, in embracing IR4.0, SMEs need to

catalyze the adoption of Industry 4.0-related technologies to remain competitive in the halal food industry. Furthermore, technology and innovation will be aligned to priority areas to accelerate innovation-driven growth. In addition, SMEs, in particular, will be encouraged to continuously enhance capacity building and accelerate technology adoption to grow faster and expand market outreach.

Based on Cicea et al. (2019), SMEs' performance can be understood from a quantitative perspective: efficiency, financial results, level of production, number of customers, market share, profitability, productivity, dynamics of revenues, costs, and liquidity, and also from a qualitative perspective: goals achievement, leadership style, employee behavior, customer satisfaction, product and process innovation, organizational and marketing innovation.

Gopang et al. (2017) considered a series of fourteen indicators to describe SMEs' performance: reputation, productivity, employee satisfaction, profits, sales, prompt order delivery, sufficient working capital, effectiveness in operations of production, product quality, achievement of targets, number of clients, easiness in supervision, reduction in product cost and product diversification. In addition, SMEs play a vital role in producing higher value-added goods and services in the food industry. Meanwhile, in the food sector, strategies will be implemented to ensure food security and safety. Priority will also be given to accelerate innovation and technology adoption among local firms, especially SMEs, to boost productivity and compete globally.

Kheng and Muthuveloo (2019), found that the competitiveness of SMEs will be increased through adopting information technology (IT). They argued that IT is considered a subcategory of information and communications technology (ICT). Having staff with knowledge in IT will ensure the company reaches its

longing level of organizational performance in today's businessworld. In this era of digitalization, it is hard for businesses to survive without using IT.

Hanifah et al. (2019) said that an innovation culture in organizations would allow SMEs to ensure their competitiveness in an unstable market and enhance their business performance. Those SMEs with technological innovation have higher growth than those without creativity in sales turnover, investment, and jobs.

The strategic behavior of SMEs to be utilized as a basis for benchmarking and improvement for SMEs in the manufacturing industry in Malaysia. Firstly, entrepreneurs should have sufficient work experience and education on the well-being of SMEs to search for the most favorable growth opportunities within the market (Moorthy et al., 2012). SMEs should react proactively to the application of the latest technologies and programs since the application of IT is noteworthy in this new era.

Additionally, using integrated marketing information and appropriate human resources might also have a consequential impact on SMEs' growth probabilities. In addition, firms should also be aware of the threats which might harmfully affect the business and try to safeguard against them proactively. Each firm should pay attention to customer and supplier relations, personnel, quality, flexibility, and planning.

2.4 Halal Concept

Halal may be defined as an act, object, or conduct over which the individual has freedom of choice, and its exercise does not carry either a reward or a punishment. Halal may have been identified by explicit evidence in the Shari'ah or by reference to the presumption of permissibility (ibahah) (Ager, 2015). Food and Agriculture

Organization of the United Nations has prepared general guidelines for using the term halal to be adopted by member countries. The term 'halal food' is defined as food permitted under Islamic Law and should fulfill the following conditions:

- i. It does not consist of or contain anything which is considered to be unlawful as stated by Islamic Law;
- ii. It has not been prepared, processed, transported, or stored using any appliance or facility that was not free from anything unlawful according to Islamic Law; and
- iii. It has not been in direct contact with any food that fails to satisfy the first two conditions above during preparation, processing, transportation, or storage.

Malaysia has a specific statute to regulate the halal concept in Malaysia (Halim, 2018; Miskam et al., 2015). The legal provisions relating to the halal industry are subjected to several statutes, namely:

- i. Trade Description Acts 2011, Trade Descriptions (Definition of Halal) Order 2011,
- ii. Trade Descriptions (Certification and Marking of Halal) Order.

This Act and its subsidiary legislation are passed to protect traders and consumers from unhealthy trade practices. For the Act, the term Halal is one trade description in the eyes of the law. The Trade Descriptions Act 2011 has the effect of repealing the Trade Descriptions Act 1972. Generally, the Act aims to promote good trade practices by prohibiting false trade descriptions and false or misleading statements, conduct, and practices concerning the supply of goods and services.

Before the Act comes into effect, using the description of "Halal" or any other expression by the dealer is not required under the existing laws in Malaysia. However, the Trade Descriptions (Definition of Halal) Order 2011, which was legislated under section 28 of the Trade Description Act 2011, provides that when food or goods are described as halal.

Besides Shariah law, the Holy Quran also states the difference between Halal and haram, Islam teaches Muslims to choose Halal food to eat. Allah says in Surah Al-Baqarah, verses 172- 173:

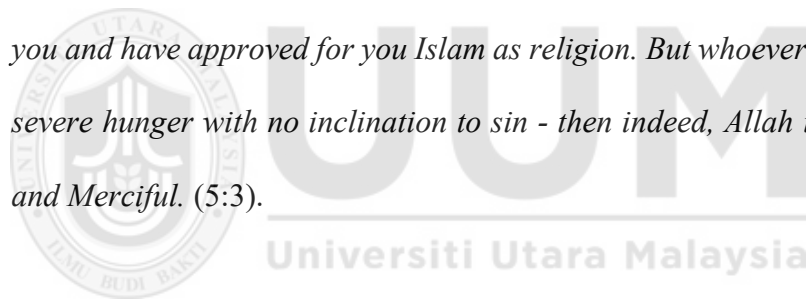
“O, you have believed, eat from the goods things which We have provided for you and be grateful to Allah if it is (indeed) Him that your worship. He has only forbidden to you dead animals, blood, the flesh of swine, and that which has been dedicated to other than Allah. But whoever is forced (by necessity), neither desiring (it) nor transgressing (its limit), there is no sin upon him. Indeed, Allah is forgiving and Merciful” (2:172-173).

It has been further explained about Halal and haram. Muslims are encouraged to choose halal food and do the matter of rights; and also, whoever abstains from doubtful matters to save religion and honor. This is mentioned in Surah Al- A’raf, verse 157:

“Those who follow the messenger, the unlettered prophet, whom they find written in what they have of the Torah and the Gospel, who enjoins upon them what is right and forbids them what is wrong and makes lawful for them the good things and prohibits for them the evil and relieves them of their burden and the shackles which were upon them. So, they who have believed in Him, honored him, supported him and followed the light which was sent down with him - it is those who will be successful.” (7: 157).

The Quranic injunctions on haram food are also mentioned in several verses, for instance:

“Prohibited to you are dead animals, blood, the flesh of swine, and that which has been dedicated to other than Allah , and [those animals] killed by strangling or by a violent blow or by a head-long fall or by the goring of horns, and those from which a wild animal has eaten, except what you [are able to] slaughter [before its death], and those which are sacrificed on stone altars, and [prohibited is] that you seek decision through divining arrows. That is grave disobedience. This day those who disbelieve have despaired of [defeating] your religion; so, fear them not, but fear Me. This day I have perfected for you your religion and completed My favor upon you and have approved for you Islam as religion. But whoever is forced by severe hunger with no inclination to sin - then indeed, Allah is Forgiving and Merciful. (5:3).



In the above verse 3 in Surah Al-Maidah, Allah states the foods forbidden to Muslims. Since the exceptions are always present in almost every matter, the Quran also leaves a gap for those dying from hunger. The rulings regarding halal and haram can also be referred to as the Sunnah of the Prophet S.A.W. Among those are: “When the Prophet (peace be on him) was asked about the sea, he replied, its water is pure and its dead are halal.” (Reported by Ahmad and other compilers of the Sunnah.).

In the two Sahih of al-Bukhari and Muslim, the authority of Jabir that the Prophet (peace be on him) once sent some of his companions on an expedition. They found a dead whale by the sea and subsisted on it for more than twenty days.

On their return to Madinah, they told the Prophet (peace be on him) about this, and the Prophet said, Eat the food which Allah has brought forth for you, and feed us from it if you have any left. They then brought him some whale meat, and he ate it (Miskam et al., 2015).

By the same method, locusts are exempted from the category of "dead animals." The Prophet (peace be on him) permitted to eat dead locusts, as the question of slaughtering them does not arise. Said Ibn Abu Awfa narrated: "We went with the Prophet (peace be on him) on seven expeditions, and we ate locusts with him." (Reported by all the authentic collections of a hadith except that of Ibn Majah.) The above authorities show that what is halal and what is haram are clear even though there are situations where certain things are not clear and require further deliberation among the scholars.

2.5 Halal Management Systems and Food Safety

Malaysia halal food standards, the MS1500, have recently been revised and gazetted for use in early 2019. Currently known as MS1500:2019 Halal Food – General Requirements (Third Revision), this year is among the changes that have happened. The Malaysian manual procedure for halal certification is also set for reintroduction with a new version. With its new guidelines on halal assurance systems, the Malaysia Halal Management System (MHMS) 2019 is also expected to be published simultaneously. Both of the documents are at their final stages of approval. Public comments and industry engagement by JAKIM on both documents have been sought since early this year.

Several issues arise from the proposed revision of MHMS 2019, which have been highlighted during public comment, and national and industry

consultation on the MHMS 2019 draft, and hopefully are taken for improvement by JAKIM. One example is laboratory analysis. The proposed MHMS 2019 draft is silenced on the number and frequency of lab testing for halal products and raw materials. The draft only specifies “critical ingredients” to be tested. This could pose a massive problem for a significant operation with hundreds and thousands of raw ingredients. With thousands of menu items, food service operators face the same issues. The draft should not leave room for ambiguity and misinterpretation by the halal certificate holders and future applicants. Not until the MHMS is fully gazette and endorsed for usage by JAKIM that the full extent of the impact and changes is yet to be seen (Adiarni & Anisaa, 2018).

The new MHMS 2019 is well anticipated as it gives a newer, better, and fresher perspective on internal halal control within the Malaysian halal certification context. Whatever outcome derived from this new amendment HAS, the primary objective of internal halal control will remain the same; to ensure objectivity and observance of halal integrity and practices.

In an organization, the management must create a working Internal Halal Committee (IHC). IHC is a group of employees specially appointed by the management to manage and run a company's HMS. It has a defined hierarchy structure, giving responsibilities and authority to conduct any halal-related activities in the companies (Jais, 2016).

A firm, especially SME, which decides to implement HMS for their product can impact their business performance. Indrasari et al. (2020) showed the impact comes from two benefits, there are internal and external benefits. For internal uses such as production, operation, human resource, and financial. Then, benefits for external like engagement with the government, business firm's

improvement, firm's image, and allowing the firms to gain halal market.

Other than that, while top management implements HMS in the organization, they got the halal certification, which will affect the innovative business performance of the food or product. Besides increasing business performance, many benefits like the quality of new halal products, total sales, customer satisfaction, and halal market shares. Halal certification for SME products is also one of the customer's attention factors before making a purchase decision. Table 2.2 shows the adoption of the halal standard in the organization to measure their business performance.

Table 2.2
Adoption of Halal Standard

Factor	Authors	Finding
Technological Factors		
Compatibility	Tan et al. (2012a)	Compatibility variables of ICT as the degree to which the adoption is compatible with Halal requirements, jobs responsibilities, and value systems.
Perceived benefits	Ngah et al. (2014)	Perceived benefits were found to have a significant relationship with the intention to adopt the Halal standard.
Organizational Factors		
Management support	Ngah et al. (2017)	Top management attitude positively influences the adoption of new technology.
Table continue		
Organizational readiness	Ngah et al. (2014)	Organizational readiness has a positive relationship with the adoption of Halal standards.
Knowledge Management		
Awareness	Ngah et al. (2017)	Awareness could be a reason why the majority of Halal manufacturers are adopting Halal standards.

Halal Integrity	Zailani et al. (2015)	Halal integrity benefits positively affect Halal orientation strategy among Halal food firms.
Environmental factors		
Government support	Tan et al. (2012b)	Government support as a service provider Halal standard.
Halal market demand	Zailani et al. (2015)	Halal market demand positively affects Halal orientation strategy among Halal food firms.

Source: Indrasari et al. (2020)

Food Safety Management System (FSMS) is intended to produce safe foods and to demonstrate how food safety has been set out and applied. This is in line with the halal standard as one of the FSMS (Ida Giyanti et al., 2021). Primary food safety practice is necessary due to rising expectations and demand by the health community (Krishnan et al., 2017). Muslim food or ritually slaughtered meat; however, interestingly, it is a standard guideline implemented to preserve the safety, quality, and integrity of halal food. Besides that, safety and quality are simultaneously observing halal practices, and safeguarding halal integrity is prevalent within the Malaysian halal food industry. The halal standard is a structured and documented food quality system. Like in International Organization for Standardization (ISO) certification for food quality standards, well-documented procedures can generate more effective job instructions and manage all factors regarding the food manufacturing process, leading to improved operational performance.

Consumers around the world, Muslim and non-Muslim, also started to realize the healthy and hygienic aspects of halal food requirements. Besides that, small food manufacturers also comply with current food safety certifications.

Therefore, a pre-certification scheme should be devised for local small manufacturers. Krishnan et al. (2017) stated the intentions of Muslims to consume halal food were significantly affected by religious self-identity and moral obligations. Halal-conscious consumers are more risk-averse so they are likely to be pickier in the selection and purchase of food.

For non-Muslims, safety is one important thing to choose their food. The religious and safety concepts associated with Halal food probably make this decision more important for consumers, which could lead to a different decision-making process, including a specific set of predictors. While the primary determinant that might positively impact Halal principles of food products among non-Muslims is their lifestyle.

2.6 Malaysia Halal Food Industry

Malaysia is already well known as a successful halal hub since 1997 when the Codex Alimentarius Commission chose Malaysia as a model for the development of the halal food industry when adopting the codex general guidelines for the use of the term halal in Geneva. Malaysia is seen as one of the world's most successful examples where a single halal standard ruling the country (Bashir et al., 2019; Chong et al., 2022). As the global pioneer in halal certification, Malaysia is widely recognized as the leading authority on matters relating to halal certification, halal standards, auditing standards, halal research, and halal training.

However, Malaysia's claim to be one of the most successful halal hubs countries in the world was being challenged because of several findings on halal food integrity issues. These issues about halal food integrity were extremely serious for Muslim consumers in Malaysia, who began to question the authenticity

of halal food products produced by food producers. The event has led consumers to question the integrity of halal food produced in Malaysia (Talib & Chin, 2018; Al-Ansi et al., 2019). Investigations into manufacturing processes revealed weaknesses in sustaining halal food integrity. The Department of Islamic Development Malaysia (JAKIM) proposed the need for critical monitoring of every halal food product and random inspections to ensure halal compliance.

With the increasingly available brands and varieties of food in the market, the authenticity of halal food has raised more concerns among Muslim consumers (Talib & Chin, 2018). The status of halal food has also become doubtful with the growing numbers of non-Muslims and foreign multinationals dominating the food industry. It seems that the suppliers and producers do not understand the peculiarity of handling halal food (Al-Ansi et al., 2019). Food products are produced and come from all parts of the world. Food products travel a greater distance and involve a lot of handlings along a supply chain before they reach the hand of consumers; thus, the integrity of halal food must be controlled and monitored to satisfy consumers with authentic halal products. The halal concept is not only restricted to the sources of food ingredients but also includes food processing and handling, packaging, storing, and delivering (Indrasari et al., 2020). In other words, it could not be considered as halal in the event that the food was not handled or stored correctly. The processing of halal food has resulted in a growing interest in the halal supply chain (HSC). The HSC works toward embedding the halal concept into the food chain to meet up with the needs of the consumer by integrating and coordinating the efforts of all parties involved in production and delivery (Al-Ansi et al., 2019).

The Small and Medium Industries Development Corporation (SMIDEC) has added another category: convenience food. But, in terms of halal food products, this will involve many more categories. The foods are listed under fourteen different types which in addition to the products listed by MIDA and SMIDEC, also include categories such as frozen food, seasoning and spices, and packaged cooking sauces. Although Malaysia remains a net importer of food, including cereals and dairy products, this product will be processed and exported. With a wide variety of products listed in the halal categories, there are opportunities for SMEs to penetrate the halal hub market.

The latest trend in the global business market is the halal industry; the demand for halal products is increasing among Muslim and non-Muslim consumers. The halal food industry is imperative for Muslims worldwide to ensure the hygiene and cleanliness of products for their health and well-being. The demand for shelf life and food freshness is desirable for the halal food industry. The current target halal market covers nearly every country in the world, including Islamic countries. For example, Japan and Australia are putting great effort into catering to a rising number of Muslim consumers by increasing their investment and expertise in halal products and services. The global Muslim population totaled 1.6 billion in 2010 and is forecasted to increase dramatically to 2.8 billion in 2050 (Wahab et al., 2019).

Hence, the Malaysian government identified the halal industry as a new source of economic growth and took this as an opportunity for Malaysia's economy. The Malaysian Government has put a key strategy to promote the country as a leading global halal hub. Today, Malaysia has globally recognized as the leading global halal hub. Other countries also view Malaysia as a leading global

halal trade nation. An important thing the Malaysian government does as a hub halal country is a compilation of halal certifications by food manufacturers (Bashir et al., 2019). The Malaysian government promotes the Malaysian standard and certification as the global benchmarks for halal products as a way to complete the development of a vibrant and competitive halal industry in Malaysia.

The Malaysian government tasked the Department of Standards to promote the standard and certification as the global standard for halal products and services. The Malaysian model has been regarded as the role model for developing world halal food industries. While the halal food industry grows (Al-Ansi et al., 2019; Bashir et al., 2019), Malaysia needs to act fast to improve its effectiveness in the halal food industry. The halal food industry's success in domestic and export markets depends on a broad range of policy developments, including those related to the law and regulations, support services, and infrastructures, such as human resource development, finance, and R&D, as well as marketing and promotional efforts.

2.7 Technological Change

From the strategic perspective, highlight the change management particularly related to technological change. Technology enhances the integrity of halal products in the halal food industry. Technology was identified as necessary by Giyanti et al. (2020b), but it requires further improvement to meet the requirements of halal assurance systems, which SMEs should prepare on technological dimensions. Constant changes in technology are expected, and SMEs must be alert to their influence on their business operations. Consequently, SMEs must also be alert to technological changes, as they will alter how they operate their businesses,

(Wahab & Kamarubahrin, 2019). SMEs must adapt the implementation of Industry 4.0; to the new technologies available as the current technological innovations have the potential to strengthen and improve their business performance.

It proves that the most significant challenge for companies moving their business to the new digital technology is to change business processes and organizational structures in the enterprise related to migration. Blooming of a technological revolution that will fundamentally alter the way of life, work, and relate to one another in the form of IR4.0. The primary commodity of the IR4.0 in the halal supply chain; is on farms, food production lines, check-out lines in supermarkets, and finally, on consumers' tables. Then, with so many benefits and opportunities of IR4.0, SMEs need to ask the fundamental question of the impact of IR4.0 on the halal food market.

Technological changes such as IR4.0 and the Industrial Internet of Things (IIoT) or Internet of Things (IoT) are excellent examples that can give benefit the halal food industry (Wyrwicka & Mrugalska, 2017). IoT means network communication between modules or embedded devices (or limited functionality) and usually some kind of connection to the physical world (Wyrwicka & Mrugalska, 2017). IoT in the halal food industry, by enabling the acquisition and accessibility of far more significant amounts of data at far greater speeds and far more efficiently, can impact halal business performance. For example, with IoT, the digitization of the halal supply chain, from farms to warehousing to food distribution and retailing, enables halal producers and regulators to expand technologies that monitor and analyze the process. In line with Takeda et al. (2022), IoT has the potential to address various halal industry challenges, including product quality, timeliness of delivery, waste, spoilage, and recalls. Leveraging

sensor technologies and real-time data analytics have allowed SMEs to precisely monitor incoming ingredients by adopting track-and-trace techniques.

Besides IoT, blockchain is another technology in IR4.0 that can influence the performance halal food industry (Talib, 2020; Khan et al., 2022; Wyrwicka & Mrugalska, 2017). Blockchain, the tamper-proof, cryptography-based record-keeping system, can be used to ensure the halal integrity of the global food safety distribution chain. If implemented carefully, halal authorities can issue the halal certificate with blockchain technology that can include production and distribution records by halal producers which allows halal producers and regulators to quickly trace products back to their source, allowing for fast recall and removal in case of contamination or fraud.

Another interesting IR4.0 technology that can benefit halal operations among SMEs is smart logistics. The benefit of smart logistics in the halal food industry is to ensure that halal products are stored and moved safely and efficiently. With the right combination of technology, smart logistics can improve halal traceability, efficient route planning, and better connectivity, helping to ensure that halal retailers and consumers are confident in the safety and quality of their products. This smart logistics implementation among SMEs can increase halal food demands from consumers. Morella et al. (2021) stated that Smart Agri-Food Logistics solutions would be developed by the Future Internet for Safe and Healthy Food from Farm to Fork program. This platform aims to provide innovative infrastructure for the cost-effective creation and delivery of versatile digital services, providing high-quality service and security guarantees. This alternative program also will affect SMEs' performance to improve the production processes, increase productivity and influence their business performance.

Historically, Wal-Mart Stores Inc. is leveraging enormous data, and now it is known as Walmart used Big Data for food safety purposes. Walmart utilizes handheld IT, Bluetooth communication, and state-of-the-art temperature measuring devices to check every batch of barbeque chicken cooked, ensuring a safe internal temperature. Big Data Analytics is another important thing in the halal food industry that SMEs should implement. Companies, which refer to Big Data in their decision-making processes, are more flexible and respond faster to market trends (Nuttah et al., 2023; Wyrwicka & Mrugalska, 2017). One aspect of Big Data application in the halal food industry is in halal audit and inspection. Halal executives and auditors have relied on halal audits or inspections to determine if a food establishment complied with halal standards and regulations. Leveraging Big Data and its information is an innovative and effective way to enhance halal regulatory compliance and track compliance with desired halal standards. This is good for top management of SMEs to comply with HMS in their company using Big Data.

Artificial intelligence (AI) application in the halal food industry is the object and pattern recognition where a researcher at Universiti Teknologi Malaysia (UTM) successfully developed a Shariah-compliant automated chicken processing system (SYCUT) (Yusof et.al., 2019). The Shariah-Compliant Automated Chicken Processing System (SYCUT) is explicitly designed to ensure adherence to the halal requirement of chicken in a slaughterhouse to give Muslim consumers peace of mind in their poultry purchases. SYCUT's main objective is to target government and private slaughterhouses, Muslim consumers, and Halal product manufacturers. The researcher found out that this AI system is built to ensure the trachea and esophagus of chicken are entirely cut and halal to eat using

high-speed cameras that will record the slaughtered slabs before the software processes the pictures, whether the chicken is slaughtered or not. If the slaughtered chicken does not fit the Syarak, the alarm system will sound and be isolated.

The slaughterhouse near Semenyih already using SYCUT in their production house. Another example of an AI application in food safety compliance is the solution developed by KanKan, a subsidiary of Remark Holding, to provide Shanghai's municipal healthagency with facial and object recognition. Their AI technology is currently being used in 200 restaurants but will soon expand to 2,000 facilities. Cameras in the kitchen or food facility watchto ensure that individuals wear masks or hair protection when required by safety regulations.

Audit compliance is one area of mobile technology application that can benefit the halal food industry (Haleem et al., 2019; Indrasari et al., 2020). It is observed that mobile technology is important for top management to manage halal audit mobility, driven through smartphones or tablets. Tablets with e-signature facilities can help collect and securely process voice data, images, videos, and even GPS coordinates as electronic evidence. An example of mobile technology application for halal compliance is Quick Halal. This cloud-based mobile halal auditing application assists in the planning, auditing, and reporting of halal audit compliance based on the Malaysian Halal Certification System.

2.8 Systems Theory

Systems Theory has been used as a foundational theory to underpin the research framework. The theory also provides an explanation for business performance based on the interactions of the system's main components. The theory offers the framework for halal food manufacturer's performance which is based on the

systems requirements. The interactions among the components in the Systems Theory lead to the company's performance (Barakat et al., 2023; Rani & Merga, 2016), as the former discussed the performance outcomes in the supply chain in a dynamic environment. Systems Theory allows for an understanding of the connections between various parts of the organization and how they interact with one another.

Systems Theory has gained prominence and is the dominant theory. This theory was first proposed in the 1940s by biologist Ludwig von Bertalanffy. Bertalanffy was recognized as one of the founders of General Systems Theory. His theory has been applied to many fields. The approach was a source of inspiration for those working to understand complex systems. Systems Theory is general in that it considers numerous systems that interact with other systems. Bertalanffy proposed some basic concepts that are especially helpful in framing the complexity of food facilities. His ideas are practical so that food safety managers and food-borne outbreak researchers can become more effective in managing risk and understanding why outbreak events unfold, thus providing a basis for improved risk management, (Bertalanffy, 1973, 1978).

Later, Patton and McMahon (2006) are among the contributors to Systems Theory from many diverse fields, including physics, biology, anthropology, and psychology (Rani & Merga, 2016), and more recent in strategic management and sustainable supply chain (Barakat et al., 2023). Jacobs (1989) stated the basic tenet of Systems Theory is that systems consist of many interacting subsystems, which are distinguished by boundaries that, in turn, monitor and control the rate and flow of inputs from the environment to the system and the outputs from the system to the environment. As Chalofsky et al. (2014), Jacobs (1989) and Yawson (2013)

argued, several influential specialists, have contributed to what is now known as General Systems Theory.

Rani and Merga (2016) identified that General Systems Theory provides a commanding framework for the Human Resources Development (HRD) practitioner to develop an organization and its employees. Their study determined that many of the initial applications of Systems Theory focused on change management and the decision-making processes used within an organization. Systems Theory offered the ability to explain concepts such as feedback, self-regulating, and interdependence of variables which preserved the complexity of the whole system.

Systems Theory applied to human resource development (HRD) presents systems theory as a unifying theory (Jacobs, 1989). Training has been largely behavior-oriented, in keeping with the emphasis on skills training. Systems Theory helps design programs to respond to defined problems. It enables people to attend to the whole and to classify and describe the parts of the system (Chalofsky et al., 2014; Watkins, 1989). Training is the process through which skills are developed, information is provided, and attributes are nurtured to help individuals who work in organizations become more effective and efficient in their work. Training helps the organization fulfill its purposes and system goals while contributing to the overall development of workers. Training is necessary to help workers qualify for a job, do the job, or advance, but it is also essential for enhancing and transforming the job to add value to the enterprise (Rani & Merga, 2016; Swanson, 2001).

Systems Theory does not specify particular theoretical frameworks for understanding problems and does not direct the social worker to specific

intervention strategies. Instead, it is an organizing conceptual framework for understanding the achievements (Meyer, 1983), or performance outcomes (Barakat et al., 2023). Hence, Systems Theory is the transdisciplinary study of the abstract organization of phenomena, independent of their substance, type, or spatial or temporal scale of existence. It investigates the principles common to all complex entities and the models that can be used to describe them.

Systems Theory also assists the organization in understanding the components and dynamics of client systems to identify problems and develop balanced intervention strategies to enhance the goodness between individuals (consumers) and their environments (Meyer, 1983). It examined the relationship between organizational structure and operating conditions using the method of comparative empirical analysis. The systems theory approach is one of the most important techniques of performance in organizations that could evaluate company performance (Barakat et al., 2023).

The Systems Theory approach is the right presumption for halal SME business performance food manufacturers. Systems Theory offers the ability to explain concepts such as feedback, self-regulation, and interdependence of variables. The components in the organization conserved the complexity of the whole system.

2.9 Model of Systems Theory

In General Systems Theory, all systems include input, processing, output, and feedback, which create relatedness between the parts. Furthermore, General Systems Theory acknowledges that the system is influenced by its more extensive surrounding system or environment (Bertalanffy, 1984). Systems Theory derives from General Systems Theory, which explores the parts of a system that

interconnect and interact to make a complete whole. Based on Swanson (2001), the basic systems theory model includes interaction between a machine, a person (people), and the environment in the whole system (refer Figure 2.2).

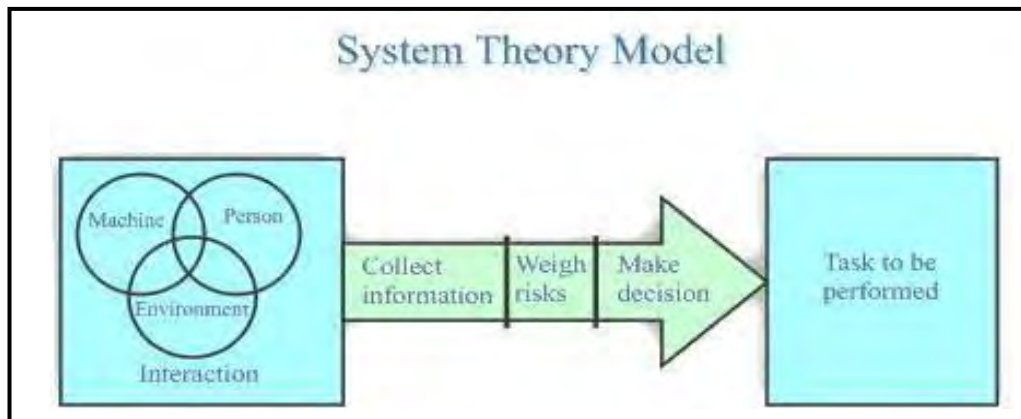


Figure 2.2
Systems Theory Model
 Source: Bertalanffy (1984)

Figure 2.2 show the interaction among three components in Systems Theory. This system needs a feedback mechanism to be effective and efficient to ascertain whether the system's outputs are what they should be. If not, a system should be able to adjust its inputs or processes to improve the outcomes. An ideal system is self-regulating. The feedback mechanism in an information system may be automated or manual. This means that, in business, this system must have the ability to inputs through the process to improve outputs that can influence business performance.

Hence, in this research, Systems Theory also is a theoretical framework for understanding how halal SME manufacturers work. A system can be defined in different ways, but it's best characterized as an entity that has all the elements necessary to carry out its functions and achieve desirable outcomes (Barakat et al., 2023). It started as a way to understand organizations from an outside perspective but has since become a means of gaining insight into daily operations within an organization.

Alter (2010) proved that the Systems Theory asserts that any organization is a single, unified system of interrelated parts or subsystems. Each part of the overall system is dependent on the others and cannot function optimally without them. Therefore, if factors are present that adversely affect one subsystem within an organization, it is likely these factors may adversely affect other subsystems too. Taking this argument into consideration, this can result in impacts on the entire system to a certain extent. This framework presents an organization as a natural ecosystem, where each element is interdependent. Various components of a system also interact with each other regularly, which is true in a modern organization like a business, or SME although this can happen in different ways. For example, a human resources department is a subsystem of an organization and probably interacts with every other subsystem. The same principle applies to the HMS department, although the nature of its interactions can vary. For example, the HMS department might interact with the IT department to arrange hardware use, with the accounting department to manage salaries, with the marketing department to engage with customers, and with the public relations department to devise press releases.

Research conducted by Selman and Guzewich (2014) found that the basic concept of Systems Theory from Bertalanffy helped frame the complexity of food safety for managers to improve risk management. Using this concept can help food safety programs enhance their performance. One facility where food managers would implement this concept is processing or manufacturing, which includes all the steps along the continuum that prepare the food for distribution.

Finally, the concept of point of final service includes any points where foods are purchased and/or consumed, such as grocery stores, restaurants, delis, or

the home. This food system concept is influenced by internal and external system variables such as machines, people, processes, and the environment. Implementing this concept also proves the internal and external system variables because these variables strongly influence every aspect of the individual food system, from inputs to outcomes, including customer health. Specifically, the internal variables can pull the system towards a safe or unsafe outcome. Understanding these variables, especially their interactions, is crucial to understanding how this system operates and why it operates the way it does such as halal assurance systems (Arif et al., 2019). Properly managing the underlying variables helps to pull the individual system's outcome towards a safe product.

Kafetzopoulos (2020) states in their research that it is crucial to understand the internal and external measures because these variables strongly influence every aspect of the halal food system, from inputs to outcomes (from farm to table). Specifically, the internal variables can pull the business performance toward the halal food industry.

Intriguing debates on the Systems Theory's importance in knowing all its components have raised its applicability for this study (e.g. Barakat et al., 2023; Kayikci et al., 2022; Münch et al., 2022). Originally, they are machines, person, and the environment. The research framework underpinned by Systems Theory includes emerging components that suited the SME halal food manufacturer context, namely machines (technology and innovation), people (top management and organizational readiness), knowledge management (understanding, awareness, and integrity), and the environment (government support and halal market demand). The environment was tested as a mediator, which could affect directly the dependent variable. The environment also tested for its mediation

effect between the independent variable and dependent which signifies a direct and indirect relationship between the independent and dependent variables. Besides, knowledge management was adopted as one of the independent variables as separated from a people component.

2.8.1 Machine

In this study, the machine adopts from systems theory relates to the organizational systems on decision-making such as technology and innovation on halal business performance.

2.8.1.1 Technology

Technological mastery is one of the most critical factors in determining an industry's competitiveness. Sahin and Topal (2018) proposed technology can be considered a tool, application, and service used to provide information for a firm. Generally, technology is a series of techniques that include the production of goods and services in the form of information writing, machine knowledge, processing, individual skills, and adaptability of the production process to basic operations and market conditions. When these conditions change or improve, they are known as technological changes or advances (Wyrwicka & Mrugalska, 2017). Changes or advances in technology will positively impact industry and the economy as it improves output quality, produces new products, and saves costs. This can directly increase the competitiveness of a company or firm.

Using technology in halal logistics is a profitable business and enhances the integrity of halal products and services. The constant changes in technology are inevitable, and firms must be alert to its influence on their business operation

and performance (Wahab & Kamarubahrin, 2019).

The halal food industry faces multiple challenges, from recalls to serving customer demands. Industry 4.0 will turn halal food manufacturers into predictors instead of reactors. This will save time and money for those who invest in the technology and influence SMEs' business performance. In this current fourth wave of manufacturing, new technology is driving the change in production and the capabilities of what can be accomplished in facilities. SMEs use an array of technology to develop competitive advantages in the economic marketplace. SMEs should consider implementing technology in their planning process for streamlined integration and future expansion. SMEs' rapid advancement and business performance have strengthened the significance of technological factors. Technology is emanating disciplines for proactively acknowledging transformations in the digital world.

Hanifah et al. (2019) suggested actions to improve performance, and attempts must be made to strengthen their infrastructure investment in capital in new technology and to acquire new machinery and equipment. Technology is the assortment of physical processes that transform inputs into outputs using procedural processes and organizational preparations to carry out the transformation. For example, SMEs use electronic machines and programs for processing, storage, transfer, and presentation to increase business performance. It can be concluded that researchers argued that when companies fail to adopt technology, it is likely to result in reduced performance, and this would spell trouble because of the aggressive and competitive business environment. Furthermore, Novia et al. (2020) proposed that regular machine maintenance should be performed to improve product quality. Aligned with Azmi (2018)

mention that the practitioners believed the technology would help them influence their business, specifically on sales growth.

Describing and measuring technology generated in the Malaysian food-based industry is crucial to understanding emerging technology. Presently, more than ever before, global food and agricultural systems are undertaking a process of rapid change. Rising consumer demand and changing consumer preferences have emerged as key drivers of agricultural prices, technology, and trade.

Global integration of agricultural markets and supply chains has created new opportunities for distributing goods, services, and ideas among suppliers, consumers, producers, researchers, and entrepreneurs including SMEs (De Martino & Magnotti, 2018; Kayikci et al., 2022). These changes have been accompanied by new technology and other fields that have the potential to change the quantity and quality of food and agriculture produced and consumed worldwide. These rapid changes and emerging conflicts strongly suggest that developing countries must develop more responsive, dynamic, and competitive agricultural sectors in the short to medium term to benefit from the changing global system. Agricultural innovation will be the order of the day, and developing countries will need innovative policies, programs, and investments just to keep up. Technological expansion within the food system most obviously contributes to the economic effectiveness of the system, mainly through a reduction in product costs and the adaptation of products to consumer criteria. However, increasingly the food system has to answer to broader societal objectives such as sustainable development (Barakat et al., 2023). Therefore, the implications of technology within the food system must be measured through a sustainability outlook.

2.8.1.2 Innovation

It is believed that innovation enhances business performance because the product of innovative activities makes a firm more competitive, and the process of invention transforms a firm's internal capabilities. The innovation process changes a firm fundamentally by enhancing its internal capabilities, making it more flexible and adaptable to market pressures than non-innovating firms. Besides that, profits and growth will increase and only last as long as the innovative firm can defend its position against the competitor. Productivity and quality also improve while firms adopt innovation.

The link between innovation and firm performance is well established in the previous research. Indeed, a wealth of evidence in the academic literature indicates a positive relationship between innovation and firm performance in the manufacturing industry (Azmi, 2018). Critically, the research stated innovation capability, conceptualized either as a process or as an outcome, affects the firm performance.

Saunila (2019) emphasized that innovative product based on innovative performance as the synergetic combination of the results of technical and administrative innovations contributes positively to organizational growth and profitability. Accordingly, innovations are generally done to meet such marketing goals as improvement in product quality, increase in sales, increase in market share, improved product design, and creation of new markets or market expansions.

Besides that, Hanifah et al. (2019) also identified that innovations can be expected to lead to improvements in market performance through product innovation. In this respect, innovation is an effective hub that carries the positive effects of business performance on market performance. More than that, the

innovation aspect among SMEs includes the intention to be innovative, the infrastructure to support innovation, the necessary behavior of SMEs to influence a market, the value orientation, and the environment to implement innovation. Thus, innovation plays an essential role in enhancing business performance. Hence, successful operation in a business environment is required to create the organization's culture.

The majority of the studies found a positive relationship between innovation capability and firm performance in the context of small businesses (e.g., Oura et al., 2016; Zhang & Hartley, 2018). Other proponents stated that innovation capability is connected to new product performance (Zhang & Hartley, 2018), brand performance (Odoom & Mensah, 2018), and overall firm performance (Khan et al., 2022; Rahim et al., 2020). Rahim et al. (2020) asserts that organizations that implement innovative solutions to problems related to their working systems will be successful and might keep Malaysia's halal industry thriving.

Firms having higher innovativeness might have higher organizational performance. High innovativeness shows a positive relationship with sales growth. Proactiveness is positively related to sales level, development, and gross profit (Kafetzopoulos & Psomas, 2015), which is supported by Khan et al. (2022) on an organization's sustainability. In other studies, proactiveness and competitive aggressiveness are differentially associated with performance in different circumstances. Mahbubi and Uchiyama (2021) assessed Indonesia's halal beef supply chain in agreement that innovation capability is a valuable strategy for exporting firms to gain competitiveness and achieve excellent business performance.

Product innovation is associated with either the creation of new markets or the enhancement of existing products. Product innovation is a continuous and cross-functional process involving and integrating a growing number of different competencies inside and outside the organization's boundaries. It is a difficult process driven by advancing technologies, changing customer needs, shortening product life cycles, and increasing global competition.

The impact of Islamic requirements in the halal food industry is notable in the production processes. Innovation has substantial effects on halal food production, such as passing materials more rapidly through the food supply chain, diminishing the impacts of distance on the sourcing of materials, and impacting the structure and diversity of food production. Production must ensure and preserve the product from contamination and be separate from haram products (Talib & Chin, 2018). In case of joint use of some equipment and machinery, these should be thoroughly cleaned to remove any residuals: in some cases, a new production line may be required. The production process must take place in an environment where hygiene, cleanliness, and health standards are strictly followed to improve halal business performance (Khan et al., 2022). An interesting aspect of innovation is its capacity both to participate in reforming current halal food production and facilitating the development of new models for halal food production.

Malaysia as a halal product manufacturer with a Halal logo by JAKIM gained world recognition that can provide product differentiation advantages to SMEs to explore international markets. The population of Malaysia in the first quarter of 2023 is approximately 33.2 million (Department of Statistics, 2023). Feeding a growing population has translated into a food security challenge. To manage this

concern, food production has to be increased and agricultural innovation has been proposed to generate new products and/or processes that will enhance the production of livestock and crops. The innovation creates and provides opportunities for the company to remain relevant to survive in an atmosphere of intense business competition.

2.8.2 People

People are the one element of cross-contamination in the halal industry that affects system interaction for halal business performance in SME food manufacturers. People refer to compatibility between employees and organizations when at least one entity provides what the other needs, shares similar fundamental characteristics, or both (Fernando et al., 2023; Shahabuddin et al., 2020). In this study, people refer to top management support and organizational readiness as factors that can affect company business performance. Besides that, total commitment and involvement from management and employees are required to apply the HMS to implement a thriving halal market environment.

Muhammad and Shao (2013) indicated successful implementation of a talent management strategy positively impacts company productivity and employee efficiency. Therefore, different human resource functions like recruitment, training, performance management, succession planning, etc., play a significant role in talent management practices. Human resource quality in terms of skills and ability to use technology remains limited. People need to work smartly in the halal business, including a good command of ICT skills.

The human resource management capabilities facilitating knowledge and expertise are essential to making a fast entry into the global halal market. Deriving,

Malaysia has begun investing in many programs to enhance human resources in the field. The investment is focused on providing programs for SMEs on halal compliance and offering degree courses in halal science.

2.8.2.1 Employee

Employee engagement is a workplace strategy that aims to ensure that employees are engaged with their organization's goals and values, driven to contribute to organizational success, and able to improve their sense of well-being at the same time. Based on research by Paul and Anantharaman (2013), they found a relationship between employee attitudes and company performance. For human resources management, two main issues are highlighted in the halal food industry: the lack of work ethic among employees of Muslims. Most food manufacturers have problems with their workers' attitudes. While the people bring critical issues, the impact on a company's performance is enormous. It was commented that in product-focused halal enterprises, employees, customers, and stakeholders are ignored (Shahabuddin et al., 2020). Fernando et al. (2023) raised the lack of storage facilities, skilled people, and inventory monitoring technologies to use multichannel distribution systems globally.

Furthermore, the process of obtaining a halal certificate does not end immediately after receiving the certificate. Still, it is even more critical because if it does not meet the requirements, it will be withdrawn at any time. Therefore, the need for organizational strength comprising a dedicated and disciplined workforce can guarantee the application of halal certificates among SMEs.

In addition, the spiritual aspect of the employee is also proved to be challenging for SMEs because it is a catalyst for an individual's success in any

field that he espouses, especially for Muslim individuals. However, there are still Muslim employees who do not pray. This will negatively affect the Muslim company's reputation as the products produced are from the hands of the non-religious. It is also a big challenge for entrepreneurs to apply for halal certificates as they feel that they are not yet ready to apply for halal certificates. According to them, the halal certification represents the entire internal and external aspect of the company, which reflects Islam in its entirety.

Yusuf et al. (2017) highlighted that halal certification or implementation does play a role in increasing their business performance in terms of human capital for many employees and skills and development. Employees with skills and knowledge about halal food could contribute to the company's performance. Skills and knowledge of the workers from purchasing side and kitchen are essential to avoid contamination in the whole food process. It is imperative to ensure the state of good skills and knowledge among the employees to protect halal integrity (Hassan et al., 2015).

2.8.2.2 Top Management

Paul and Anantharaman (2013) identified that top management is the primary link across the organizational functions that need to assist the team's decision and be involved in resolving the conflicts that may arise throughout the task implementation. Top management must make its organization more adventurous and creative by consistently promoting new ideas. This is because the manager possesses power and authority as they are the key to the decision-making technique.

Top management is committed to the organization, such as adequate support, halal education and training for employees, has as personnel empowerment, providing information and knowledge, halal policy and procedures, and focusing on customer demand. These factors can affect organizational performance in halal implementation, so SMEs must pay attention to them (Indrasari et al., 2020). In the halal food industry, top management capability can be defined as senior executives' capability and concern about the halal business's needs. Top management must plan well regarding consultant skills, budget reliability, providing halal training for employees, and implementation and compatibility with halal standards as in HMS.

In the context of SMEs, the top management forms part of the board of directors and plays significant roles in overseeing the business operation and adherence to the set of standards and procedures for the benefit of its stakeholders (Ramli, 2020). Being the top management team responsible for giving direction to the company, it is expected that the top management of food-producing manufacturers is responsible for determining that securing halal certification and consistent compliance with halal food procedures are successfully fulfilled.

Previous research by Hashim and Shariff (2016), proves that nowadays, the ultimate success of the Halal industry depends on the management's ability to provide specialized halal training and development to increase their business competitiveness. Top management should realize that halal training is important to employees because it can provide new skills in halal management and shariah knowledge in managing halal products and services. The objectives of the training are:

- i. To improve employees' knowledge of the importance of the halal of product, critical points of materials, and process.
- ii. To make employees understand the Halal Assurance System (HAS).

Apart from giving training on halal, the management must create a working Internal Halal Committee (IHC). IHC is a group of employees, specially appointed by the management to manage and run the halal system in a company. It has a defined hierarchy structure, giving responsibilities and authority to conduct any halal-related activities in the companies. IHC also needs to include participation from each or another branch of the company, ideally representing each step in the process flow. For example, participation will come from production, purchasing and procurement, technical or quality assurance (QA) and quality control (QC) as well as Research and Development (R&D). These people are the key personnel that deals directly with the HMS. There has been a promotion of halal besides halal training. Ramli (2020) highlighted the top management who are responsible for promoting halal in their company should be more aggressive, as the availability of halal food in the market is facing many challenges to compete. Instead of enforcing the SMEs to follow standards provided by JAKIM to be awarded the halal logo, the government could enforce them to meet the halal requirements not only in the pre-production and during production processes but also in the entire supply chain activities. So, firms should be aware of and understand certain halal issues in the halal industry and market to perform in the halal industry.

Halal implementation and commitment towards HMS need to come from the top-level management. Jais (2019) stated that top management includes board members, managers, and executives that are the most important people in the organization in terms of policy planning and execution. They need to be exposed to

the importance and benefits of halal, implementation of halal as well as the repercussion for business performance. Top management who realigned strategies to implement Halal standards in the organization can prepare for future opportunities, risks, and halal market trends. This makes way for the firms to analyze, examine and execute the halal food industry for competitive advantage.

Top management also must use talent management as a business strategy to retain their top talented employees and improve the organization's performance. This strategy can increase the organization's performance based on employee's performance while employees have unique competencies which the competitors cannot replicate, the organization automatically gains a competitive edge over its competitors. Therefore, organizations can create effective systems and processes for talent management. Besides that, Human Resources Department needs to determine which skills exist internally and what other skills are needed, now and in the future (Dewantara et al., 2018). This is as successful talent management that SMEs need to develop a value proposition for employees as compelling as the one it provides for customers.

Talent management also helps employees feel engaged, skilled, and motivated, allowing them to work in the direction of the company's business goals and increasing consumer satisfaction and business performance. If business is more integrated, consumer satisfaction rates are usually higher, since they are dealing with fewer people and their needs are met more rapidly.

By looking into these issues in the halal food industry, employers can plan human resource strategies that is talent management in restructuring its human resource and corporate policies to sustain its business and retain the employees. HR also highlighted that managing global talent has become a new area of concern

for organizations in the current scenario for effective competitiveness to enhance performance and productivity (Li et al., 2020).

2.8.2.3 Organization Readiness

Organizational readiness is important to be considered in new technology adoption to expand market growth (Giyanti et al., 2020a). Organizational readiness varies according to the internal characteristics and property of a firm to the type of new technology going to be adopted. Even though there are differences in organizational readiness, it still plays an important role in the decision to adopt an innovation. Organizational readiness is a way the company solves the problem in the network. The capability of the players finds a solution in the supply chain to improve their performance. Azmi et al. (2019) found that organizational readiness is the highest factor loading indicating the company is ready for new policies and practices in business production and also the company is ready to re-align company policies and strategy to achieve business objectives.

In the halal food industry, organizational readiness is defined here as the capability of the top management to adopt HMS and employees who understand the operations for Halal standards (Ngah et al., 2019). Consequently, means that organizational readiness also can be defined here as the capability of operation management to adopt HMS in terms of financial, human resources, technical support, expertise, infrastructure, logistics, and others to implement halal standards for competitive advantages to increase firm business performance.

Organizational readiness is the level of the manager's commitment to the adoption of new technology in the organization (Giyanti et al., 2020b). Organizational readiness varies according to the internal characteristics and

property of a firm to the type of new technology to be adopted. It is the extent to which the availability of the resource is equal to the requirement to adopt new technology and can be sustained for some time. Besides that, organizational readiness varies consistent with the internal characteristics and properties of a firm to the type of new technology to be adopted. Organizational readiness is the capability of the operation management to adopt Halal transportation services in terms of financial and human resources.

Organizations need to prepare to meet a situation and carry out a planned sequence of actions to adopt Halal standards. The organization should consider all the capabilities of the operation management before adopting Halal standards. This factor is the existence of external and internal information system that provides the development of customer and partner relationship management mechanism for halal (Dewantara et al., 2018).

It is important for organizations ready to adopt an innovation in the halal food industry. As stated by Azmi et al. (2019), firms are recognized in the innovation literature as an influential factor in the adoption of innovation to increase a company's sales. Likewise, Bhuiyan et al. (2016a,b) state that sales turnover has a significant relationship with food product innovations of small and medium enterprises. This is a new approach, which examines halal food industry business performance in the context of adoption approaches. Firms like SMEs should be realized that adopting innovation in the halal food industry for growth and opportunity for businesses. As a result, SMEs that embrace innovation have a sizable advantage in ultimately meeting the demands of their customers for halal demands.

2.8.3 Environment

The environment is one of the important factors that influence system interaction with halal food manufacturers. Environmental factors can be explained as external factors or identifiable elements within the consumer, government, cultural, economic, demographic, physical, technological, or environment which impact the growth, operations, and survival of an organization (Rashid & Bojei, 2019; Vrontis & Pavlou 2008). This factor also be an important aspect of making a business successful. In the absence of a clear strategy, setting up meaningful objectives and goals can be very difficult. While drafting functional strategy in halal systems, conducting a macro environment analysis within which the business is operating will help in determining the outcomes of a strategy. In conjunction with Perdani et al. (2018), the halal control point of the production process can be derived from the exposure to haram and impure resources, employees, hygiene in the environment, and the method of packaging.

2.8.3.1 Government Support

Eventually, the government's role in ensuring the halal food industry is very significant which includes planning, developing, implementing, regulating, promoting, and educating Muslim consumers and the halal industrial players in the halal market (Asila, 2021; Haleem et al., 2019). Adha et al. (2017) mentioned that government support refers to policies, regulations, and agencies introduced by the government as well as incentives such as grants, finance, training, conference, and provides infrastructure. Government support also comes in the form of policies, procedures, and guidelines. Halal food practitioners need to get support from the government because legislation from the government that specifically regulates

this industry as a whole also becomes a factor that led to the involvement of the various government agencies in this industry. Besides, the role of the government that influence halal business for SMEs is the government efforts have managed to position Malaysia's halal certification as the most reliable standard and Malaysia is known for its halal certification. Halal certificate is important to halal food manufacturers because halal certification is to gain the Halal market and also attract consumers (Asila, 2021) and make a better profit for the company (Baharuddin & Ismail, 2018).

Thus, government support is the degree of the government's support in assisting and protecting the quality and safety of the halal product. The government provides knowledgeable, concerned about citizens' health and releases relatively accurate information about food safety (Talib & Chin, 2018). The government provides a platform for research facilities in the halal industry. The research that will be conducted under this research program will focus on the production of alternative processes using halal sources to replace sources with current halal elements. For instance, the research on alternative halal enzymes to replace non-halal enzymes.

In addition, previous research also focuses on the issue of alcohol in food and beverages available in the market. At the same time, the study will also focus on the search for alternative materials such as halal fiber gelatin, enzymes from plants, and more (Elgharbawy et al., 2020). They focus on addressing non-halal protein and lipid sources, such as emulsifier production from halal lipid sources but can mimic emulsifier properties from halal sources. Jia and Chaozhi (2021) stated wine, alcohol, and non-Islamic-slaughtered animals are likewise haram.

The government provides sufficient infrastructures for halal standard implementation including for SMEs to emphasize their halal business (Adha et al., 2017). Various programs have been organized by the government to ensure the success of halal initiatives in Malaysia. The Ministry of International Trade and Industry (MITI) has formulated strategies and is providing incentives to encourage trade and investment in halal products and services. Such as for the production of halal ingredients, MITI provided facilities, machinery, and equipment. Then, through participation in various international fora, MITI will continue to enhance collaborations with OIC member countries to promote the Halal sector. Strategies and plans for halal development were included in the nation's policy and planning initiatives. The SMECorp, another agency under MITI provides matching grants to SMEs to promote halal products. Activities covered relate to product development and product formulation, sample testing, acquisition of machinery and equipment, renovation expenditures, and other related costs for compliance to requirements of halal certification and promotional activities.

The HDC is a government-backed corporation that coordinates the overall development of the Halal industry in an integrated and comprehensive manner. Department of Standards focuses on the development of halal standards; branding and promotion; and commercial development of halal products and services. Synchronizing HDC's role with the Halal Industry Master Plan 2030, HDC is set to raise the bar to drive the industry players to the next growth level; strengthening the Malaysia Halal ecosystem to make it more robust by creating a more business-friendly environment for the industry players to meet the growing demand (HDCglobal.com).

2.8.3.2 Halal Market Demand

Halal market demand refers to the needs and wants resulting from consumer and community pressures in the halal industry (Silalahi et al., 2021). Consumer pressure for halal products increases when consumers become more informed. Presently, consumer demand for food production has also changed considerably. The choice of Halal foods which is a quality and healthy is one of the greatest lifestyle offerings by the halal industry for Muslims as well as non-Muslim consumers. The demand for halal foods is increasing as consumers are becoming aware of halal integrity in terms of halal certification, halal standards, and halal raw materials.

The food and beverages sector is also the biggest sector in the industry occupying about 56% of the global Muslim spending across lifestyle sectors. Total Muslim spending on food and beverages was \$1.24 Trillion in 2016 (Azam & Abdullah, 2020), and approximately \$1.38 Trillion in 2022 with a growth rate of 6.2% from the previous year, and projected \$1.67 Trillion in 2025 (BIMP-EAGA, 2022; Statista, 2023). The higher demand for food is expected to increase by more than 70% by 2050, indicating strong consumer demand. There are significant opportunities for global halal foods as the sector is growing tremendously.

A few theories examine the behavioral aspects of the consumer to halal market demand. According to Musa and Fam (2018), the Theory of Planned Behavior (TPB) measure the behavioral aspects at the consumer level of halal market demand. The TPB model suggests that intention is directly driven by three significant constructs attitude, subjective norm, and perceived behavioral control. The stronger the intention, the more likely an individual will perform the behavior. Likewise, in halal food and safety, the behaviors are not under

complete volitional control. As a result, perceived behavioral control becomes a more important determinant of behavior in a prominent work by Ortega et al. (2007). The TPB food safety intervention was previously found to improve knowledge and self-reported behavior. A positive outlook, strong convictions, and a sense of agency in food choices were found to be predictive of the future consumption of halal meat (Ali et al., 2018; Vanany et al., 2019). The TPB intervention utilized behavior change techniques commonly applied in behavior change interventions (Abraham et al., 2010). Therefore, this led to introduce the TPB model illustrated that was implemented by SMEs in Figure 2.3.

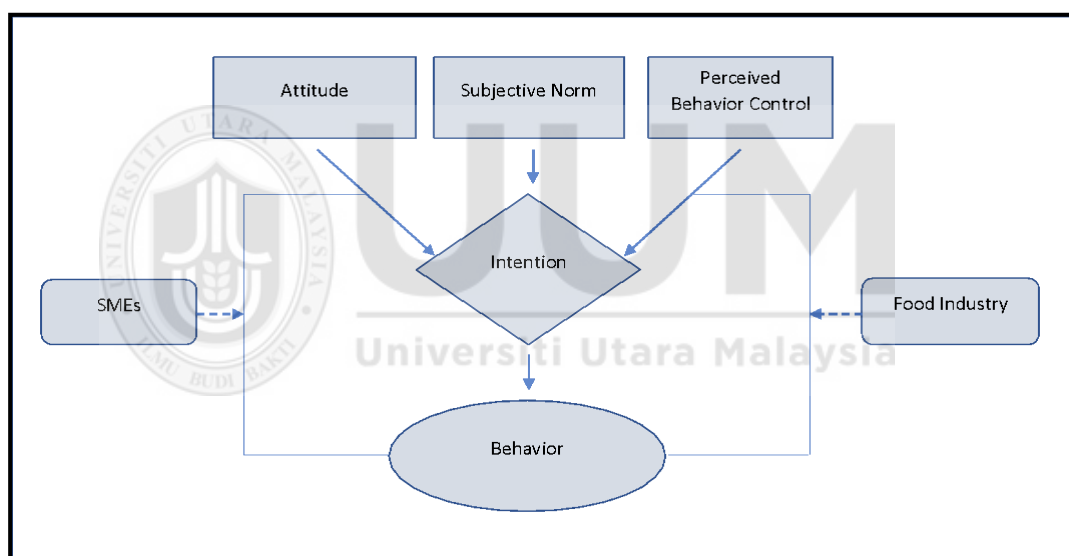


Figure 2.3
Theory of Planned Behavior
 Source: Adapted from Ajzen (1991)

Mukhtar and Butt (2012) recommended the usage of the Theory of Reasoned Action (TRA) to predict consumers' purchasing behavior regarding halal products. TRA defines the links between the beliefs, attitudes, norms, intentions, and behaviors of individuals as in Figure 2.4. According to this model, a person's behavior is determined by his intention to perform the behavior, this intention is in turn a function of the person's attitudes and his subjective norms towards the behavior (Youn et al., 2021).

The intention is the cognitive representation of a person's readiness to perform a given behavior and it is considered to be the immediate precursor of behavior, it is determined by three variables: attitude toward a specific behavior, subjective norms, and perceived behavioral control. The subjective norms are the person's perception that most people who are important to him think he should or should not perform the behavior in question. (Ajzen & Fishbein, 1980). Figure 2.4 show the TRA theory toward intentions of consumer towards halal market demand:

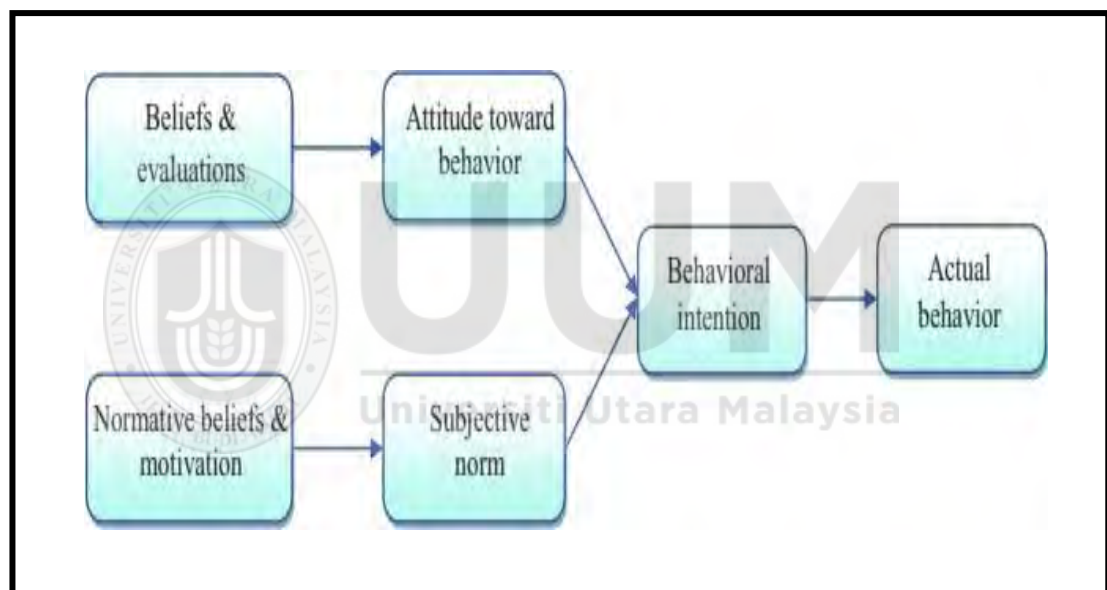


Figure 2.4
Theory of Reasoned Action
Source: Ajzen and Fishbein (1980)

The demand for halal food is increasing among Muslim and non-Muslim consumers. Demand for halal food is expected to increase in line with the world population. The demand for halal food among Muslims is because of religious issues. At the same time, the increasing demand from non - Muslim consumers in Malaysia is influenced by the growing concern about health-conscious. Besides the awareness of halal food and it's positioning as hygienic, safe, and clean food,

the community requests well-prepared products in terms of the slaughtering process, cleanliness, and other reasons. This healthier lifestyle becomes attention not just to Muslim users but also non-Muslim consumers (Azam & Abdullah, 2020). Growing demand for halal food and a healthier lifestyle from both Muslim and non-Muslim users show a significant and positive impact on the halal industry. Hence, there are several opportunities for SMEs to grasp and fulfill the halal market by accommodating the Shariah requirements in their food products based on consumers' demand.

Furthermore, cultural assimilation in a multiracial country like Malaysia has shaped the purchase intention of non-Muslim consumers toward Halal food products. Regarding analysis by the Research and Market Agency of Dublin (2019), the primary concern for the manufacturers is to determine the specific standard hence, the manufacturers have to constantly update various certifications as leading organizations for halal standardization and accreditation have been taking steps to harmonize the standards. Furthermore, manufacturers have been trying to drive change in the entire value chain of this market including raw material, product development to finished product packaging, marketing, and spreading the benefits of consuming these products along with the creative advertisement is fueling the halal food market over the forecast period.

In addition, the economic term, willingness to pay, refers to the price of reservation, or in other words, the maximum amount a customer is willing to pay for a variety of products. It is also defined as the price at which a consumer is indifferent to buying and not buying a product is referred to as willingness to pay. To achieve the halal compliance parameter, the services of halal operations are needed for incorporating the costs. However, the problems, such as the refusal of

consumers to pay more for Halal products, can affect the demand of consumers for these products and can obstruct the halal products' success.

2.8.4 Knowledge Management

Previous researchers believe that firms can stand out in one or more value-added disciplines; they can achieve unique competitive advantages and excellent organizational performance (Torabi & El-Den, 2017). Knowledge management is likely to be a value-added method, more actively using knowledge and expertise to create value and improve organizational efficiency (Rašula et al., 2012). Organizations with a higher level of knowledge management capabilities are more likely to increase the competitiveness of an entrepreneur by collecting, organizing, and transforming knowledge to implement (Shujahat et al., 2018). Therefore, knowledge management practices play an important role not only in the firm's performance but also lead to entrepreneurial performance. The process of knowledge management operation in an organization is complex and the entrepreneurs are managing, respectively. Thus, this study focuses on the key practices that organizations acquire and use to improve their knowledge.

Knowledge is very important for both consumers and food manufacturers in the halal food industry. Knowledge provides guidelines not only for Muslim consumers but also to channel the behavior of non-Muslim consumers to choose Halal food for them to consume. Knowledge also influenced food manufacturers seeking Halal certification and Halal system management for business competitive advantage. Therefore, food manufacturers should provide healthy, clean, and safe food to their consumers to avoid delivering poor-quality food to consumers and non-halal food to Muslim consumers.

On the other hand, Hashim and Shariff (2016) argued about training that ensures the realization of creating awareness and integrity of the halal process. In HIMP 2030, MITI (2023) envisioned Malaysia as the global champion in the halal industry in the current year. Since 2006, MITI has highlighted the inputs and goals of halal training programs, which served to:

- i. provide knowledge and understanding about halal as defined by the HDC, Malaysia
- ii. provide knowledge on the process of obtaining Malaysian halal certification
- iii. products are not only halal but also hygienic and nutritious
- iv. identify the benefits of Halal certification

Lack of knowledge, awareness, and understanding of the Halal concept among the manufacturers of halal products may cause a loss of appreciation for halal. Halal knowledge is about how the Muslim individual should digest and practice some Islamic teachings regarding halal and haram. Therefore, halal knowledge is vital to one of the criteria for Muslim entrepreneurs (Li et al., 2020).

Zaim et al. (2019) mentioned knowledge is the best driving force for entrepreneurial and organizational performance and success. Knowledge is the essential element of an organization for achieving a competitive advantage and maximum outcomes. Knowledge management is defined as the explicit and effective management of important knowledge and its related practices of identification and exploitation (Nghah et al., 2017). Effective knowledge resources make up knowledge capability among organizations with the help of knowledge sharing, knowledge creation, innovativeness, and knowledge absorption. Therefore, when these resources merged it determines the knowledge management

practices which ultimately turn into the relationship with organizational performance.

The importance identifying the halal knowledge of the halal concept amongst the SMEs concerned would perhaps assist them to improve regulations towards types of food produced so that they are following Islamic teachings. Besides that, to fulfill consumer demands for halal food. Knowledge of Shariah compliance for halal production is crucial for employees delivering mass quantities of halal products to the market (Rashid & Bojei, 2019; Ali et al., 2022). Rakhmawati et al. (2019), developed links for consumers such as a web application and an android application that provides recommendations on the halal and nutritional status of a food product. This tool can provide information for consumers to choose halal, safe, and healthy food. The Muslim community in this country still does not have confidence in products manufactured by Muslims, even though the products are chosen. Moreover, none can prevent people from using the product, but as an attempt to deal with it, an awareness campaign can be implemented through non-governmental organizations.

Even though there are many studies have been done related to halal issues, this study, however, is focusing on the knowledge management of halal food production. This is unquestionably one of the largest voids in this study; employees should be well-versed in the HMS and HAS factors that influence business performance.

2.8.4.1 Understanding

To maintain their performance as a producer of halal food products, SMEs need to implement HMSs following the Shariah law, and halal certification application as

encouraged by Halal Development Corporation (HDC) to comply with GMP and Hazard Analysis Critical Control Points (HACCP) requirements. This is to increase Muslim and non-Muslim consumers' trust in the halal food products they produce. According to Minister in the Prime Minister's Department, in the Year 2019, a total of 10,186 local and international companies received the Malaysian halal certificate issued by JAKIM. In JAKIM (2022), a total quantity of 7,742 companies were certified as halal JAKIM in Malaysia. This indicates an increase in Halal certification demand.

Hassan et al. (2015) examined halal executives who were found to implement halal assurance based on their basic knowledge and skills, their general knowledge of Islam, and their knowledge and experience in managing food premises. Besides that, the halal executives implement the halal assurance based on their apprehension and consciousness in Islam that is closely related to the rules of Syara' and their technical knowledge related to the field of food technology and good practices in handling food at the food premises provided by the authorities (Hassan et al., 2015). Giyanti et al. (2021), made an argument in their research, food quality standards such as HACCP and ISO 9001 became the critical factors affecting the effectiveness of employees and the company. With this commitment, an organization can maintain halal integrity.

Baharuddin et al. (2015), find out from their research entrepreneurs may be considered knowledgeable and understand the general halal concept in Shariah law whereby they know the procedure to distinguish between halal and haram products in Malaysia. Talib and Chin (2018) found a positive and significant relationship between SMEs' commitment and halal food standard implementation among halal-certified food manufacturers.

2.8.4.2 Awareness

Knowledge not only influences halal food manufacturers such as SMEs in producing food as one of the competitive advantages of the halal industry but also meets the needs of today's consumers armed with knowledge of halal products. Today's consumers also possess the knowledge towards choosing halal food, in making sure that the products are safe and hygienic and also the effect on their health. Nusran et al. (2018) stated that the increasing number of Muslim consumers around the world and the raise of awareness among their recent generations are two crucial reasons behind the new trend in the change of behavior among Muslim consumers. Since Muslim consumers are aware of the prohibition from using non-halal ingredients such as alcohol, pork, and any other related items, this may lead to a rapidly rising demand for halal products.

Therefore, knowledge is an essential element in the halal food industry to ensure the well-being of the halal food product to consumers in terms of food product selection; making sure that the food is clean, safe, and healthy. The knowledge of halal processes in the production of halal products is also important for manufacturers to compete with each other to meet the needs of Muslim and non-Muslim consumers. The ability to meet consumer requirements will improve the performance of manufacturers in the halal industry.

Increasing awareness of halal awareness among Muslim and non-Muslim consumers has led to an increase in demand for halal food products and other products such as cosmetics, medicines, and more. In this regard, SMEs, which are halal food manufacturers need to formulate effective strategies by implementing a HMS in the production of halal food products to meet consumer demand. SMEs are trying to attract consumers by complying with the halal standard set so that

consumers can purchase the products without having a doubt. SMEs or halal food manufacturers involved in the halal industry need not worry about continuing to compete in this halal market as increasing halal awareness has increased demand for halal food products.

Research from Zailani and Iranmanesh (2016) found that SME entrepreneurs agreed that awareness of halal entrepreneurship, favorable intrinsic motivation, an effort to seek out opportunity, perceived desirability, peer influence, perceived feasibility, and perceived governmental support are attractive for halal entrepreneurship. Elias et al. (2016) disclosed the level of awareness among SMEs in Malaysia towards the granting of halal certification is at a low level. Hence, SMEs must increase their awareness because awareness of the 'halalness' concept is a must for any Muslim individual either a consumer or an entrepreneur. This is the most important element that should be followed according to Shariah Law towards the production of halal products, halal integrity (Supian & Rashid, 2018), and services.

2.8.4.3 Integrity

Besides knowledge and awareness, integrity is one of the important matters for SMEs that influence their business performance because integrity is a commitment in thought and action to a morally justifiable set of principles and values to conduct a business. SMEs play a vital role as halal food manufacturers to implement integrity in business. In this context, the implementation must fulfill the requirement of the standards starting from the raw materials until the final consumption. For example, receiving raw materials (ingredients) and packaging material procedures are critical checkpoints in assuring the integrity and

wholesomeness of halal food.

Azmi et al. (2018) asserted that halal integrity provides the assurance required to forge strong relationships with partners to ensure that each product is manufactured to the highest standards and is not mixed with non-halal ingredients, such as alcohol- or pork-related products, throughout the entire supply chain. The industry is now demanding more specialized halal-compliant solutions for its supply chain process to maintain the legitimacy of some halal products. Moreover, firms must have an integrated system that is halal-oriented (Zailani et al., 2015). Halal integrity cannot be compromised at any stage, and consumers are highly demanding in terms of quality and assurance when it comes to halal products. As such, it is expected that the people who find themselves honest have a higher intention to implement halal business (Soltanian et al., 2016). Halal integrity makes the standards of halal more comprehensive and efficient. Besides, awareness of halal becomes better.

2.9 Comparisons of Literature related to model construct

Table 2.3 shows among the researchers such as Fard & Amiri (2018) use the Multidimensional of Construct and Reflective Measurement Model in the different subject or context of investigation. For example, a study done by Fadhlur et.al., (2018) related to Halal food supply chain whereas Giyanti et al., (2021) used the model for Halal standard for SME. In contradict managed the data use Unidimensional of Construct and Formative Measurement Model Assessment to find out the relationship of technology and consumer demand (Poudel, et al., (2019) and government by Ramli (2020).

Table 2.3

Comparisons of Literature related to model construct

No	Author/Year	Subject/Context	Measurement of Construct	Measurement Model
1	Fadhlur et.al., (2018)	Halal food supply chain	Multidimensional of Construct	Reflective Measurement Model Assessment
2.	Fard, H.M., & Amiri, S.N. (2018)	Entrepreneurial marketing	Multidimensional of Construct	Reflective Measurement Model Assessment
3.	Kijkasiwat, P. & Phuensane, P. (2020)	Innovation and Firm Performance	Multidimensional of Construct	Reflective Measurement Model Assessment
4.	Othman, B et al., (2017)	Halal certification of food manufacturing	Multidimensional of Construct	Reflective Measurement Model Assessment
5.	Giyanti, I et al., (2021).	Halal standard and firm performance.	Multidimensional of Construct	Reflective Measurement Model Assessment
6	Poudel, et al., (2019).	Entrepreneurial Orientation, Technological Capability, and Consumer Attitude on Firm Performance	Unidimensional of Construct	Formative Measurement Model Assessment
7.	Jayakrishnan et al., (2018).	Halal certification of food manufacturing	Unidimensional of Construct	Formative Measurement Model Assessment
8.	Ramli, J. A. (2020)	Governance and Halal Compliance	Unidimensional of Construct	Formative Measurement Model Assessment

2.9 Research Framework

The research framework for this study was developed based on the literature review and the identification of the theoretical gaps (see Figure 2.5). The framework shows the independent variables; machine (technology and innovation), people (top management and organizational readiness), knowledge management (understanding, awareness, and integrity), and mediator variable; environment (government support and halal market demand).

This study uses a Systems Theory to measure halal business performance among SMEs. Thus, it can determine the relationship between machines, people and knowledge management mediates by the environment influencing business

halal performance in the halal food industry. The development of this interaction will assist SMEs in achieving some common functional goals as halal food manufacturers. Knowledge management refers to information on the products' halal characteristics, such as understanding and awareness of halal. These relationships were based on the research objectives and hypotheses developed earlier. Figure 2.5 portrays such causal-effect relationships.

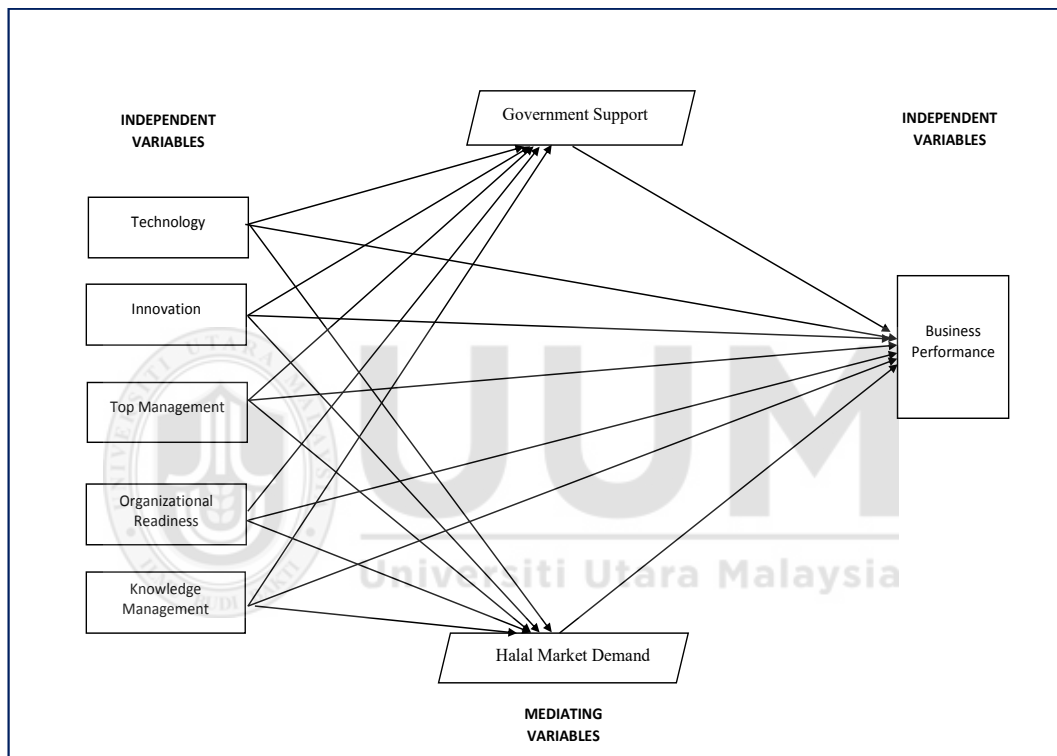


Figure 2.5
Research Framework

The research framework in this study is underpinned by one theory, namely the Systems Theory. Systems Theory is a theoretical framework for understanding how organizations work. A system can be defined in different ways, but it's best characterized as an entity that has all the elements necessary to carry out its functions. It started as a way to understand organizations from an outside perspective but has since become a means of gaining insight into daily operations within an organization. The Systems Theory of management asserts that any

organization is a single, unified system of interrelated parts or subsystems. Each part of the overall system is dependent on the others and cannot function optimally without them. Therefore, if factors are present that adversely affect one subsystem within an organization, it's likely these factors may adversely affect other subsystems, too. This can result in impacts on the entire system to a certain extent. This framework presents an organization as a natural ecosystem, where each element is interdependent.

Various components of a system also interact with each other regularly, which is true in a modern organization like a business, although this can happen in different ways. Systems Theory also assists the organization in understanding the components and dynamics of client systems to identify problems and develop balanced intervention strategies to enhance the goodness between individuals (consumers) and their environments (Meyer, 1983). It examined the relationship between organizational structure and operating conditions using the method of comparative empirical analysis. The Systems Theory approach is one of the most critical techniques of performance in organizations that could evaluate company business performance.

Based on the definition of Systems Theory above, it is related to this study framework. Each variable has a relationship with each other and has an impact on business performance. Each part of the overall system is dependent on the others and cannot function optimally without them. For example, top management (people) is a subsystem of an organization and needs to interact with the employee to implement HMS which is this interaction interdependent with knowledge management variables about the understanding to comply with halal standards. The same principle applies to managers and employees (people) ready to

implement new technology (machine) because technological expansion within the food system most obviously contributes to the economic effectiveness of the system, mainly through a reduction in product costs and the adaptation of products to consumer criteria.

A Systems Theory approach is suitable for halal SMEs who want to implement strategy performance in their company. The theory offered the ability to explain concepts such as feedback, self-regulation, and interdependence of variables which preserved the complexity of the whole system. The interaction between three variables in systems theory there are machines, people, and knowledge management can influence a company's business performance. This theory was adopted in this study which as a mediator can also affect SMEs' halal business performance.

2.10 Hypothesis Development

Hypotheses have been developed to test the theoretical link relationship of interaction between machines, people, and knowledge management and mediate by the environment are integrated and embedded in the performance of SMEs in the halal food industry. Hypotheses give details information rather than research questions. One of the differences is the ability of a hypothesis that could determine the directions of a relationship between the variables (Zikmund et al., 2010).

Hypotheses will be constructed after the propositions are formulated for empirical testing (Cooper & Schindler, 2014). In this study, research was conducted to see how machines, people A, and knowledge management can affect the performance of halal businesses. Hence, the underpinning of the Systems theory Model and previous literature will be engaged. The following sections

elaborate on the theoretical arguments on why and how those variables could affect halal business performance:

2.10.1 Machine and Business Performance

2.10.1.1 Technology

The importance of technology investment can be defined as the implementation of cutting-edge technological equipment or innovative processes that result in increased profit, productivity, activity outcomes, lower costs, improved quality, competitive advantage, market share, and overall firm performance (Kheng & Muthuveloo, 2019). Every year, businesses invest significant money in technology to help them make better decisions, run their businesses more efficiently, and achieve their strategic objectives. Technological investments are huge cash outlays for many companies and considerably impact business performance.

Past studies have established the link between technology and business performance, (Sahin & Topal, 2018), the research presents a new conceptual framework for analyzing why manufacturing companies chose to invest in new technology and equipment to improve their business performance. Firms strive to upgrade their infrastructure by investing resources in new technologies and acquiring new machinery and equipment to improve performance. Physical capital, specific plant and machinery, and IT investments are all linked to the acceptance and diffusion of cutting-edge innovations that improve performance.

Kheng and Muthuveloo (2019), found that using computers to store, study, retrieve, transmit, and alter data, or information, is known as IT. It is frequently used in the context of a business or other enterprise. IT is a subset of information and communication technology (ICT). In today's corporate world, having people

with this understanding will ensure that the company achieves its desired level of organizational performance. It is difficult for businesses to survive in this digitalization era without using IT.

Similarly, Lo et al. (2016) discovered that technology orientation is related to both financial and non-financial performance in a significant and beneficial way. It has been proven that technology-oriented businesses have a better probability of outperforming their competitors. The organization's business performance may not increase if it fails to adapt sophisticated technologies to benefit its clients. As a result, any high-tech adaption must be compatible.

The relationship between IT-enabled dynamic skills and competitive performance was investigated by Mikalef and Pateli (2017). According to the authors, the impact of IT-enabled dynamic capabilities on competitive performance is mediated by organizational performance. Based on the findings, IT-enabled dynamic capabilities enable two forms of agility: market capitalizing agility and operational adjustment agility. Both improve competitive performance with high organizational business performance.

Fard and Amiri (2018) undoubtedly support the use of technology in halal meat production that could improve the way customers are served. Later before, Bagheri et al. (2012) found the relationship between technology investment and company performance can be divided into three categories. First, multiple studies have shown that there is no link between technical investments and corporate performance. Second, the research team claims that there is a strong positive relationship between technology investment and corporate performance. Companies' performance will increase as they invest more in technology. The positive relationship between technology investment and firm performance was

described using a variety of approaches and sample data. Hence, the hypothesis is developed as:

H₁: Technology affects the halal business performance of SMEs.

2.10.1.2 Innovation

Innovation is the key to gaining a competitive advantage in a highly volatile halal world market. It is a major driving force behind nation-state economic progress that required the invention of the systems. The ability to innovate directly impacts one's ability to compete on an individual, corporate, regional, and national level. The values created by innovations are frequently manifested in new ways of doing things and new products and processes that add to prosperity (Haleem et al., 2019). When we regard a firm as a collection of resources, skills, and competencies, the effect of innovation is to modify its inner capacities, making it more adaptable, better able to learn, and more capable of exploiting new ideas. This increased adaptability is critical in the face of shifting market conditions. Thus, innovation improves a firm's competitiveness and business performance.

Saunila (2019) highlighted what firms have in common is that their success is largely driven by innovation. While size and possession of assets can provide a competitive advantage, the trend is increasingly favoring organizations that can mobilize knowledge, technological skills, and experience to create novelty in their offerings (product/service) and how they create and deliver those offerings. Innovation is important not just at the level of individual businesses but also as a source of national economic growth and business performance.

Based on a past study connected to the above variable innovation, Fadhlur et al. (2018) found that all firms will encounter radical changes constantly;

innovation becomes a condition that can assist the company in thriving in today's globalization market. Innovation has become increasingly significant and necessary to contribute to increased productivity, competitiveness, economic performance, and social goals.

To address the extant gaps, critically postulated that there is a significant positive association between innovation, market orientation, knowledge management, and financial performance, all of which are closely tied to improving business performance (Ramli & Soelton, 2018). They found from their research, that findings suggest that an increase in market attractiveness and unique resources partially influenced innovation management, implying an improvement in the business performance of Organic Fertilizer Industries in Indonesia. Hence, the effect of each category on Innovation management, market attractiveness, and unique resources indirectly influences business performance. As a result, the outcome of the variables substantially impacted business performance.

Hanifah et al. (2019) discovered innovations related to radical or incremental have made an exciting contribution to firm performance. The innovation process can be viewed as an effective driver for enhancing the innovation and trade performance of the organization. Rajapathirana and Hui (2018) examine innovation capability as identifying future customer needs, expectations, and potential customers. Furthermore, the application of organizational internal including employee and external knowledge by developing an innovation support organizational performance to generate new ideas and transform them into successful innovations.

On the other hand, substantial research has shown that organizational innovation is positively associated with innovation performance and contributes to

a better understanding of which types of capabilities would affect competitive advantage that can generate economic rent (Zhang et al., 2018). The study's findings indicate that innovation (product, process, administrative/organizational) has a favorable and significant impact on organizational performance regarding financial, growth, customer, and internal process. Furthermore, product and process innovation significantly impact organizational business performance. In general, innovation is viewed as a component that can benefit a business to gain a competitive edge.

The argument is supported by the study by Indrasari et al. (2020). Halal certification significantly affects the innovative performance of halal-certified food companies. Innovative performance influences the number of potential halal products. The improvements in innovative performance lead to market performance improvements. Market performance includes market share, total sales, customer satisfaction, and the firm's image and reputation. Innovative performance fully mediates the relationship between halal certification and market performance. Hence, the research hypothesis developed as below:

H₂: Innovation affects the halal business performance of SMEs.

2.10.2 People and Business Performance

2.10.2.1 Top Management

Top management team diversity has become vital for gaining a competitive advantage in today's business world. Leadership with multi-skills, and unique, and relevant talents has become a critical component of the organization's vital success. Despite this, every firm emphasizes that its top executives use their ultimate skills to develop effective strategies for tremendous growth and innovation

(Shammugam & Marimuthu, 2018). They examined that the pioneer academics also found top managers with high task-related diversity. The tasks positively impact organizational performance since their work experiences and education level significantly impact their cognitive structures, knowledge, and abilities.

Therefore, senior managers must have various skills and abilities to select the best strategy at the right time from options such as low-cost leadership, innovative orientation, diversification strategy, manufacturing, and private brand development (Lin et al., 2015). It makes sense given the significance of varied top management with various perspectives, varying levels of expertise, extensive knowledge, and the capacity to make excellent decisions to run the organization's goals and accomplish business performance.

-Indrasari et al. (2020) showed in their research organizations that want to obtain halal certification and be successful in implementing it must have appropriate management responsibility and employee policies. Regarding management responsibilities, enterprises must raise halal awareness among employees, ensure the halal policy is understood, prevent haram materials from entering the premises, and conduct internal halal audits. Meanwhile, in terms of staff policy, companies must ensure that the Halal policy is sufficiently displayed for the reminder, that there is a good record of food handler training, and that the staff has had the necessary typhoid vaccination. The employees must also follow Good Manufacturing Practices in their operations, be appropriately taught to comprehend halal, and finally, a viral infection policy must be provided and enforced by them. Without a commitment from the top, implementing halal certification processes in enterprises may have little chance of success.

Muhamed et al. (2020) also conducted research on top management as an independent variable of firm performance. They found that top management plays a significant role in determining business performance in halal SMEs. Therefore, the hypothesis is as below:

H₃: Top management affects the halal business performance of SMEs.

2.10.2.2 Organizational Readiness

Azmi et al. (2019) found that organizational readiness is the highest factor loading indicates the company is ready for new policies and practices. Halal systems in business production and the company are prepared to re-align companies' policies and strategies to achieve business objectives.

In the halal food industry, organizational readiness is defined here as the capability of the top management to adopt the HMS and employees who understand the operations of halal standards (Ngah et al., 2019). Thus, organizational readiness can also be defined here as the capability of operation management to adopt an HMS in terms of financial, human resources, technical support, expertise, infrastructure, logistics, and others to implement halal standards for competitive advantages.

This study of organizational readiness is representative of the employee that adopted and adapted the HMS in their company. Many previous studies examined employee and business performance in the halal industry. Indrasari et al. (2020) determined that the success factors of a product having halal certification are critical of halal certification. Top management commitment, proper assistance, halal training and education, staff characteristics and management, halal personnel empowerment, information and knowledge capacity and exposure, policy and

procedure, supplier management, teamwork, and consumer focus. Every factor in CSFs impacts halal implementation, so the company must pay attention to them. Without a commitment from the employee, implementing Halal certification processes in enterprises may have little chance of success. In this study, they found the influence of employees on SMEs' business performance that adopt Halal certification. There were also studies on organizational readiness as an independent variable. Dewantara et al. (2018) discussed on the organizational readiness of SMEs to enter the modern market is assessed by using the good manufacturing practice and a halal assurance system.

Research conducted by Salindal (2019) shows that there is a relationship between halal certification and business performance when organizations adopt halal certification in their company. The results maintained the claim that halal certification implemented in the Philippines halal-certified food companies positively affects innovative performance. Halal training is essential for human resource development in the halal industry toward business performance.

Hashim and Shariff (2016) described the training as a process that uses various approaches to improve employees' knowledge and skills required to do their jobs effectively. From research examined by Hashim and Shariff (2016), implementing the halal training program in the halal industry is significant as awareness of halal products and the halal industry nowadays is very important. The employees needed to comply with and understand HMS. To meet the firm's business nature, halal executives require knowledge and competency skills (Li et al., 2020). Hence, the following hypothesis can be proposed:

H4: Organizational readiness affect the halal business performance of SMEs.

2.10.3 Knowledge Management

Knowledge management can be defined as the management of intellectual capital, specifically knowledge held in personnel skills (human capital), the internal structure (structural capital), and the external structure (external capital) (relational capital). Knowledge management is closely linked to intellectual capital management (Li et al., 2020). Individuals with valued knowledge help to achieve and extend the organizational performance that ultimately contributes to the sustainability of the organizations (Ha & Lo, 2018). Therefore, organizations lacking knowledge-sharing capacities do not perform well in competitive markets. Service with a lot of knowledge industry is expanding quicker than ever, with knowledge workers accounting for the majority of new positions. Most firms implementing knowledge management have found it relatively easier to put technology and processes in place, but people and leadership competencies have posed more problems.

Knowledge management, according to Malhotra (2003), a global pioneer of knowledge management, is a people, process, and technology-based equation. There has been a lot of scholarly work done over the years. Some key factors in knowledge management have been identified as processes, intellectual capital, culture, and strategy (Li et al., 2020).

Organizations with more knowledge management capabilities are more likely to improve an entrepreneur's competitiveness by gathering, organizing, and transforming knowledge into actionable knowledge (Shujahat et al., 2018). As a result, knowledge management methods are vital for the firm's performance and entrepreneurial success. The operation of knowledge management in an organization is complex, and the entrepreneurs are in charge. As a result, this

research focuses on the critical methods companies acquire and apply to improve their knowledge.

Research by Zaim et al. (2019), proved a substantial positive relationship between knowledge management and organizational performance. This research looks at creating a culture that might help people exchange knowledge from within and outside their firms. The organization's expertise has become an asset, and its successful use as a core competence will yield the intended benefits. In addition, Li et al. (2020) proved that knowledge-sharing capacity positively influences organizational performance. This study investigates the impact of knowledge as an arbitrator on entrepreneurial and organizational performance. Therefore, the hypothesis of this research is formulated as follows:

H₅: Knowledge management affects the halal business performance of SMEs

2.10.4 Environment as a Mediator

2.10.4.1 Government Support

Past studies have examined government support as a predictor of business performance (Cano-Kollmann et al., 2017; Desai & Shaikh, 2018; Songling et al., 2018). Government support is the degree of the government's support in assisting and protecting the quality and safety of the halal product. The role of government can be divided into six broad categories: (1) regulation, (2) financial incentives, (3) taxation, (4) infrastructure, (5) guidance and encouragement, and (6) education and labor supply (Talib et al., 2020). Government's sufficient infrastructures for halal standard implementation. These roles prove that government also provides many infrastructures for SMEs to emphasize their halal business (Adha et al., 2017).

In Malaysia, several government agencies are involved in managing the halal industry, both directly and indirectly. JAKIM and the HDC are the two primary agencies in Malaysia that are frequently linked with halal certification. The Halal Hub Division, a special department set up by JAKIM, is responsible for halal certification. Both organizations serve critical roles in the Malaysian halal business, yet their responsibilities are significantly different.

Related to the HDC, Haleem et al. (2019) indicate that a dearth of support from the government and regulatory bodies, as well as a lack of institutionalization, might adversely affect the industry's halal execution. Regarding Hashim & Shariff (2016), the MITI stated that the inputs and objectives for halal training and halal training programs serve to:

- i. provide knowledge and understanding about *Halalan Toyyiban* as defined by the HDC, Malaysia;
- ii. provide knowledge on the process of obtaining Malaysian halal certification;
- iii. products are not only halal but also toyyib (hygiene and nutritious); and
- iv. identify the benefits of halal certification

Many previous studies stated government support as an independent variable with significant business performance. Adha et al. (2017) determined that each government agency concerned should fulfill its critical responsibilities to help the Malaysian halal food business grow and thrive. These agencies set up a special commission to monitor and regulate all Halal-related matters and also in drafting the Halal Act in the near future.

The government's role in guaranteeing the integrity of the Halal food supply chain is critical. Government tasks in ensuring Halal food supply chain

integrity (Supian & Rashid, 2018), in addition to that, as Verma (2020) included planning, creating, implementing, regulating, marketing, and educating Halal industry respondents and Halal consumers. In addition, the government's role includes establishing authorities and oversight bodies to license and control all areas of halal certification, audits, and guidelines. As well as in the halal logistics industry, the government's regulatory role is evident, particularly by establishing a series of industry standards (Haleem & Khan, 2017; Rahman et al., 2018; Rashid & Bojei, 2020). Hence, Rashid and Bojei (2020) discussed the Malaysian government providing direct monetary funds via grant allocation to encourage more halal-certified enterprises in the country should be followed. Similarly, financial incentives from the government could help enhance logistics performance and promote more logistics companies to become halal certified (Talib et al., 2016). Moreover, as most halal companies are SMEs (Zailani et al., 2015), and logistics facilities and infrastructures are capital-intensive (Ngah et al., 2017), there needs to be financial assistance from the government to kick-start halal logistics operations and service offerings.

Khan et al. (2018) explained IT infrastructure is crucial for adopting traceability in the halal supply chain and government backing are critical in developing IT infrastructure. Furthermore, the high expense of creating and managing infrastructure (Ngah et al., 2017) necessitates government help in publicly run infrastructure. The hypotheses developed as below:

H_{6a}: Government support mediates the effect of technology on the halal business performance of SMEs.

H_{6b}: Government support mediates the effect of innovation on the halal business performance of SMEs.

H_{6c}: Government support mediates the effect of top management on the halal business performance of SMEs.

H_{6d}: Government support mediates the effect of organizational readiness on the halal business performance of SMEs.

H_{6e}: Government support mediates the effect of knowledge management on the halal business performance of SMEs.

2.10.4.2 Halal Market Demand

Previous studies also conducted halal market demand as a predictor of business performance. The demand for halal food is increasing among Muslim and non-Muslim consumers. Demand for halal food is expected to increase in line with the world population. The demand for halal food among Muslims because of religious issues, while the increasing demand from non - Muslim consumers in Malaysia is influenced by the growing concern of health-conscious, awareness of halal food and its positioning as hygienic, safe and clean food, a community that requests a well-prepared product in terms of the slaughtering process, cleanliness and other reasons.

The issue of questionable food additives has raised public awareness of halal food buying and consumption in recent years. As a result, before consumer purchase and consumption, the halal certification has become the primary assurance mark. Customer demand for halal certification is increasing as a result of this situation. Food firms are devoted to ensuring that the products on the market are uncompromisingly halal-certified in response to consumer demand. From this perspective, it's reasonable to assume that, because halal food consumption is a market standard, and there's a lot of demand from the Muslim consumer market,

businesses will feel the pressures and will eventually be encouraged to implement halal food certification.

In the Muslim community, the halal label is significant in the halal food industry. The main reasons for halal certification are health, animal welfare, religion, and food safety. The demand said that the ingredients used in the food should be halal, as well as the manufacturing method. The halal label has encouraged Muslim consumers to believe they are buying halal food, which has a beneficial effect on food purchases (Awan et al., 2015). Food, pharmaceuticals, personal care, cosmetics, banking services, travel, and education are all examples of global demand for halal items. Lim et al. (2022) identified the halal emblem boosts customer confidence due to its widespread acceptance among Muslim consumers. Consumer attitudes, subjective standards, perceived behavioral control, and purpose all influence consumers' decisions to buy halal cosmetics and personal care goods (Haqea et al., 2018).

Many studies determined external pressures have been identified as a factor in many firms' adoption of the halal food standard. It indicates that they are motivated to implement the halal food standard due to government pressure, customer or market demand, and the level of competition (Talib et al., 2016). The findings showed that consumer pressure or halal market demand and government regulation significantly affect the food firms implementing halal foods standards. Based on this perspective, halal food consumption is a business requirement, and businesses must meet customer demand for certified halal foods. Failure to do so may result in companies missing out on a valuable consumer food market.

Following the discussion on halal food certification and the definition of isomorphic pressures in the context of halal certification, the subsections discuss

and highlight the incentives for implementing halal food certification. Silalahi et al. (2021) found that consumer demand did not significantly affect the intention to adopt halal practices. Contrary to the results on consumers' awareness of halal recognition, which leads to high demand for halal products (Fitria et al., 2019; Mutmainah, 2018). The following hypotheses were developed:

H_{7a}: Halal market demand mediates the effect of technology on the halal business performance of SMEs.

H_{7b}: Halal market demand mediates the effect of innovation on the halal business performance of SMEs.

H_{7c}: Halal market demand mediates the effect of top management on the halal business performance of SMEs.

H_{7d}: Halal market demand mediates the effect of organizational readiness on the halal business performance of SMEs.

H_{7e}: Halal market demand mediates the effect of knowledge management on the halal business performance of SMEs.

Figure 2.6 shows the connections of all hypotheses stated earlier in this section, on the systems interactions that included the independent variables, which are technology, innovation, top management, organizational readiness, and knowledge management that are mediated by government support, and halal market demand towards the business performance.

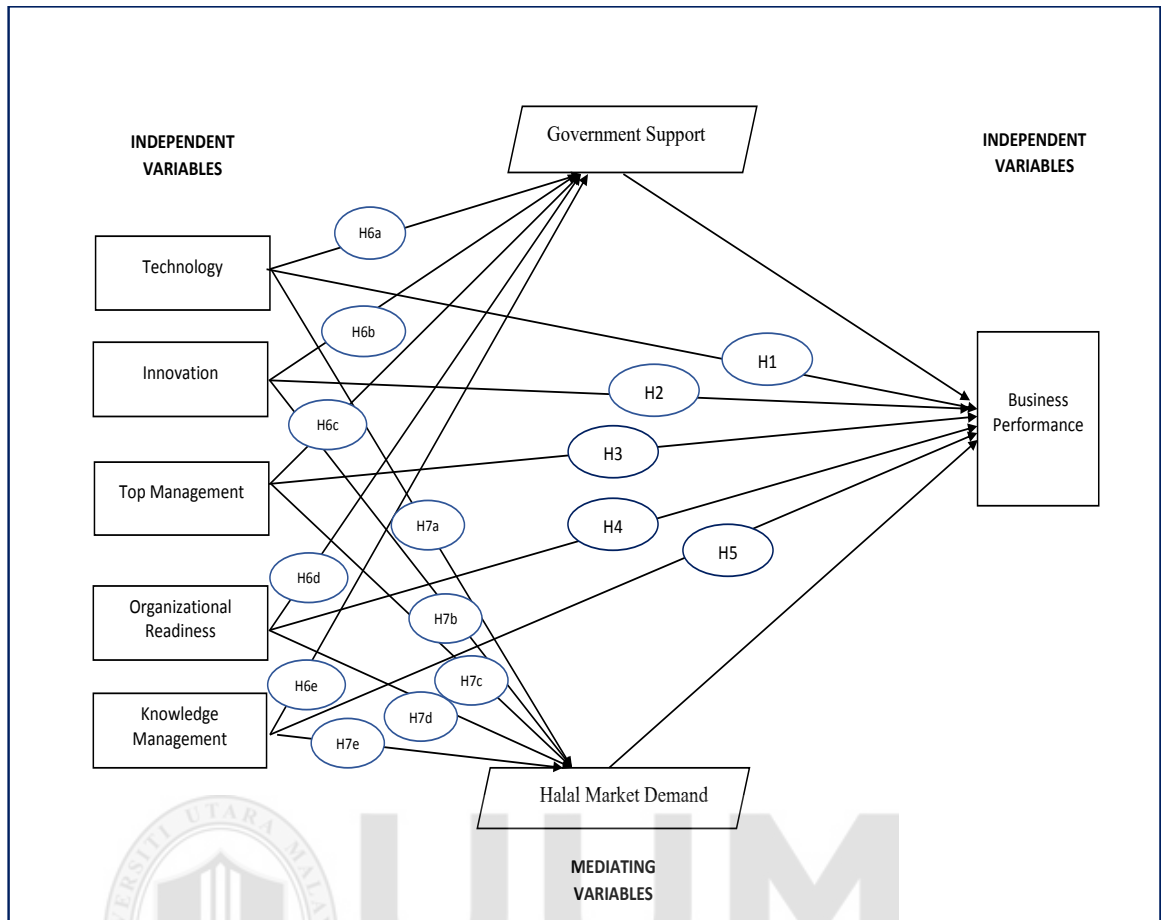


Figure 2.6
Hypothesis Framework

2.11 Chapter Summary

This chapter has elaborated and analyzed the current literature on the study of halal business performance. It discussed the central notions used in this present study, such as technology, innovation, top management support, organizational readiness, awareness, and integrity that influence the performance of SMEs in the halal industry. Government support and the halal market as a mediator also affect SMEs' business performance which government and consumers play a vital role in the halal food industry. The literature on halal food industry concepts is appropriate as an antecedent for halal food manufacturers to measure their performance, which is influenced by variables.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter explains in detail the methodology employed in the study on the direct effects of the independent variables; machine, people, and knowledge management, and a mediation effect of environment on SMEs' halal business performance. The chapter is organized according to the following sections: research design, population, sampling method, instrumentation, data collection process, validity and reliability of the measurements, pretest, and pilot test.

3.2 Research Paradigm

As discussed in each section, the research paradigm pertains to the philosophy of truth from ontological and methodological perspectives. It is believed that positivism is suitable for guiding the researcher's perspective on what constitutes truth and knowledge.

The research strategy is primarily based on the business performance of halal practices among SMEs. The research paradigm was contextualized within the context of SMEs. Consequently, this section establishes the research paradigm discussed prominently by Kuhn, as cited by Schwandt (2001), also Guba and Lincoln (1994). A community of scientists with a particular method of thinking could resolve the problems in halal business performance. In addition, the research paradigm outlined the manner in which to represent the commitments, beliefs, values, methods, perspectives, etc. that are shared across a discipline.

The manner in which researchers conceive of the problem is determined by the ontological nature of business performance issues in a halal environment and the interaction of systems. The paradigm provides the means for this study to investigate the issues and increase the body of knowledge. In business performance, which the researcher placed under strategic management, the positivist research paradigm was deemed credible. A paradigm is a method for describing a worldview informed by philosophical assumptions. It consisted of the ontology, which in this study pertains to the performance of halal businesses, and several system interactions. The epistemology is concerned with how we know what we know, while the axiology is concerned with what we believe to be true (Patton, 2002). Consequently, the positivist perspective guides the current research strategy by establishing prior ideas, beliefs, and hypotheses regarding the ontology of the study. In the context of halal food manufacturers, the methodological procedure is therefore guided by philosophical beliefs regarding the essence of reality in SME business performance, knowledge, and values, as stipulated by Systems Theory. The ontology of strategic management discussed in Chapter 2 guides the research. On the halal business performance of SMEs, the Systems Theory informs comprehension, interpretation, choice of literature, and research practice.

Consequently, the positivist perspective is necessary for resolving and expanding knowledge in order to cover the gaps in previous research. The researcher has determined positivism to be a credible and trustworthy source of knowledge and believes in the existence of genuine knowledge. In this business performance investigation, the research paradigm guides the methodology investigation based on the research questions. Quantitative methodology was employed in the positivistic paradigm of this study. The positivism and

philosophical assumptions regarding perceptions of reality that are associated with the research methodology and data collection techniques. As a result, the quantitative method was employed to obtain the answers and the supporting evidence. The researcher recognizes that the selection of the current research paradigm is the optimal response to the previously stated research questions.

In addition, Systems Theory was used by the researcher to examine business performance, which was surrounded by the problem statement's key issues. On the basis of the SME's value system, which is associated with the systems component, the appropriateness of the Systems Theory was determined, allowing the researcher to adopt a positivist paradigm. The research identified the design of a methodology in conjunction with the research procedure.

In this positivist paradigm, the researcher is conducting research to discover the generalizable truth of Systems Theory through inductive reasoning. As ontological assumptions, the philosophical underpinnings are predominately a context-based realism with probabilistic knowledge (reality). The objective character of knowledge necessitates a rigorous scientific approach, as discussed in the following section. The positivist paradigm's veracity is determined through precise observation and measurement, a quantitative approach to the impact of system components on business performance, and the mediating roles of government support and halal market demand. The positivist paradigm of the study justified the use of survey questionnaires for data collection in this study. The subsequent sections discussed the specifics of the conducted research.

3.3 Research Design

Related to the positivist perspectives, this study establishes a step-by-step research design to attain the research objectives. A methodological approach for an effective research design is a crucial decision-making process. The arrangement of data gathering and analysis in a way that tries to combine relevance to the research purpose is also known as a research design (Bryman, 2015). Research design is crucial because it allows the various research procedures to run smoothly, resulting in research that is as professional as possible, yielding maximum information with the least amount of effort, time, and money spent. It also aids in identifying inadequacies and flaws before the study begins. As a result, the researcher took seven (7) actions, as shown in Figure 3.1:

- i. Identify the objective clearly and justify its selection,
- ii. Review previously published literature associated with the problem area,
- iii. Clearly and explicitly specify hypotheses [i.e., research questions] central to the problem selected,
- iv. Describe the methods of analysis which will be applied to the data in determining whether or not the hypotheses are true or false,
- v. Determine the source of data,
- vi. Effectively describe the data which will be necessary for an adequate test of the hypotheses and explain how such data will be obtained, and
- vii. Discussed the findings

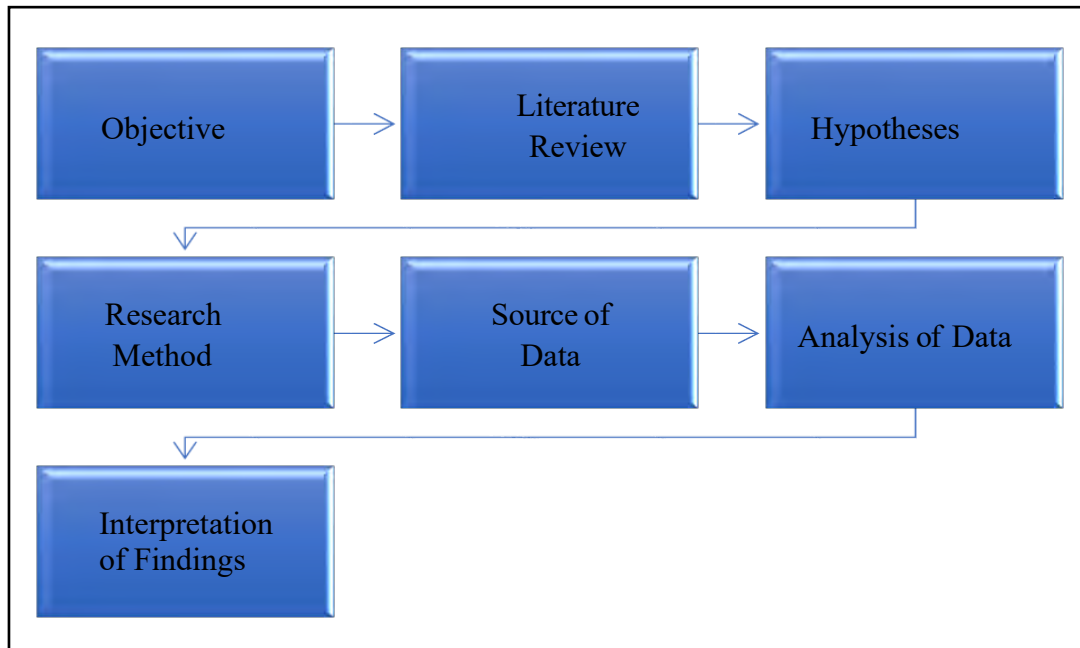


Figure 3.1
Research Design

3.4 Quantitative Methods

This research takes a quantitative method as a philosophical stand. The positivist approach allowed this study in developing falsifiable hypotheses based on literature review. Quantitative research isolates facts (objectivity) from values (subjectivity). Hence, in this research, quantitative research quantifies variables and solves problems using numeric assessment. A method of ontological reasoning based on Systems Theory that depicts the interactions between systems in the context of halal business performance. Combining environment with ontological reasoning techniques to correlate the key components in the theory. In addition, epistemology is the process the researcher uses to know that truth is quantitative. The methodology adopted by quantitative research is mostly experimental with a focus on hypothesis testing. Hypothesis testing means finding the cause-and-effect relationship between variables. The quantitative research paradigm gained prominence due to its ease to adopt standard ways to conduct

the research. Quantitative research is also highly generalizable as compared to qualitative research (Kennedy, 2017; Schwandt, 2001).

A quantitative approach was considered the most appropriate because it is used to test research objectives and hypotheses that have already been developed. In addition, it allows for the collection of large volumes of data to test the relationships between variables. Descriptive research was also utilized because the purpose of this study is to describe the nature of relationships between machine, people knowledge management, environment, and halal business performance among SME food manufacturers in Malaysia.

This study was a cross-sectional study because it involves the gathering of data at one point in time to achieve the research objectives. A cross-sectional study is more economical, and it does not take much time compared to a longitudinal study which is carried out repeatedly over an extended period (Cooper & Schindler, 2014).

The quantitative approach method involves quantifying and analyzing variables. It entails using numerical data and analyzing that data using specific statistical procedures to answer questions (Apuke, 2017). Quantitative data collection and analysis use statistical methods to collect and analyze data. Data collection quantifies information and exposes it to statistical analysis to support or refute alternative knowledge assertions (Apuke, 2017).

A series of well-structured questionnaires comprised the initial section of the investigation, attached with a letter for data collection (Appendix B). There was a consideration for standardized questionnaires to be administered to groups, which was further described in Dudwick et al. (2006). Standardized questionnaires are concerned with questionnaire sampling, questionnaire design, and

questionnaire administration to acquire information from the group/population under research and then better analyze their behavior/characteristics. Quantitative research is also used to characterize the process of evaluating objective theories by examining the relationships between variables. Instruments measure these variables, allowing statistical methods to be applied to the numerical data.

This study provided a survey questionnaire as a method of quantitative approach. A survey questionnaire method was employed to collect data through self-administered questionnaires. According to Saunders et al. (2014), a survey is designed to collect data from a sample to generate the results for a population.

It is also a research strategy that involves the structured collection of data from a sizeable population besides providing the benefits of being feasible to large samples, the flexibility of responding to many questions on a topic, and reliability (Babbie, 2010). A questionnaire was also used because it is considered an efficient data collection mechanism when the researcher knows exactly what is required and how to measure the variables of interest (Sekaran & Bougie, 2016). Sekaran and Bougie (2016) referred questionnaire as a pre-formulated written set of questions to which respondents record their answers, usually within rather closely defined alternatives.

3.5 Population and Sampling

The study's aims carefully define the research population. From the aspect of the study, which is the SME halal food makers, the focused sampling comes from JAKIM-certified and halal food manufacturers.

This population was chosen because of their essential contributions to achieving the study's goals. The sampling frame, as advised by several writers such

as Guest (2013), Sekaran and Bougie (2016), and Zikmund et al. (2010) is used to select the correct and accurate. Zikmund et al. (2010) define a population as the entire group of distinct demographic elements relevant to the research project. Cooper and Schindler (2014) explained sampling is the process of choosing selected elements from a population to represent that group. In terms of population, the sample size needs to be set to guarantee that statistically generalizable results are generated.

This study gathered a lot of information about halal food manufacturing SMEs in Malaysia that are registered with JAKIM. The research made extensive use of data from the HDC directory website. There are 5,027 companies registered under JAKIM, with halal certification valid till 2020. (JAKIM, 2020). The website JAKIM used to access it (www.jakim.gov.my). For this study, 200 SMEs company registered through JAKIM were used as samples, representing their top management as a unit analysis.

This study also looked at operational capabilities more closely linked to middle-level management than top management. It was created to evaluate those in charge of putting strategy into action rather than developing it. Nonaka and Takeuchi (1995) stated that middle-level managers are vital because their knowledge allows them to lead teams. These middle managers report to upper management and supervise support staff, which are critical to the organization's knowledge generation process (McAdam & Reid, 2000). As a result, data from mid-level management is being gathered.

3.5.1 Sampling Techniques

Sampling techniques are one of the most critical parts of designing population sampling (Taherdoost, 2018). This technique uses a method that selects a representative subset of the population called a sample. Sampling makes research more accurate and economical. It's the sampling method that determines the generalizability of the research findings. In simple words, sampling is the process of choosing a sample of the population to study. Davis (2005) stated how to sample the units from the study population, which have general sampling approaches; there are mainly two sampling techniques; probability sampling and nonprobability sampling. The sample should represent the population in all respects.

Using a sampling technique, the researcher can choose a sample drawn by assigning selection probabilities to each draw (Showkat & Parveen, 2017). Zikmund et al. (2010) stated one way to conduct random sampling is for the researcher to design a sampling frame and then select a sample from the sampling frame using a random number-generating computer program (Taherdoost, 2018). Commonly, all probabilistic approaches are based on a chance selection procedure (Zikmund et al., 2010).

Probability sampling presents the element of true randomness, which refers to the procedure for selecting the sample but does not describe the data in the sample. The type of probability sampling used in this study is simple random sampling. In other words, this method ensured the sample would precisely reflect the population based on criteria used for simple random sampling (Blumberg et al., 2014). Some probability sampling methods are as follows:

- i. Simple Random Sampling
- ii. Stratified Random Sampling

- iii. Systematic Random Sampling
- iv. Cluster Sampling
- v. Multi-stage Systematic Sampling

Unlike the probability sampling method, the non-probability sampling technique uses nonrandomized methods to draw the sample. Non-probability sampling method mostly involves judgment. Instead of randomization, respondents are selected because they are easy to access (Showkat & Parveen, 2017). Some non-probability methods of sampling are as follows:

- i. Convenience Sampling
- ii. Purposive Sampling
- iii. Quota Sampling
- iv. Snowball sampling

This study adopted probability random sampling because of the need to generalize the findings to the population. In selecting the respondents to be administered with the questionnaires, a systematic random sampling method was used. Systematic random sampling involves drawing every n^{th} element in the population starting with a randomly chosen element between 1 and n (Sekaran & Bougie, 2016). The reason for selecting this technique was due to a large sampling frame, and the listing of the elements is conveniently available in one place.

In addition, systematic sampling offers the advantages of ease and quickness in developing the sample. The process of selecting the samples randomly from the sampling frame was conducted by using Microsoft Office Excel 2010. From there, every K^{th} element would be selected from the list (Malhotra, 2003); for instance, in this study where every $k=2$, every 2nd name was repeatedly picked up from the

list of approximately 5,027 names of SMEs company in the sampling frame (Malhotra, 2006; Bordens & Abbott, 2002), until a final total of SMEs halal food manufacturers names were gathered from the list. Based on the population of 5,027 from the sampling frame (Krejcie & Morgan, 1970), which this number is in line with Roscoe's (1975) rules of thumb for determining sample size, which sample sizes larger than 30 and less than 500 are appropriate for most research (Sekaran & Bougie, 2016). Figure 3.2 show that six (6) steps were undertaken by this research as below:

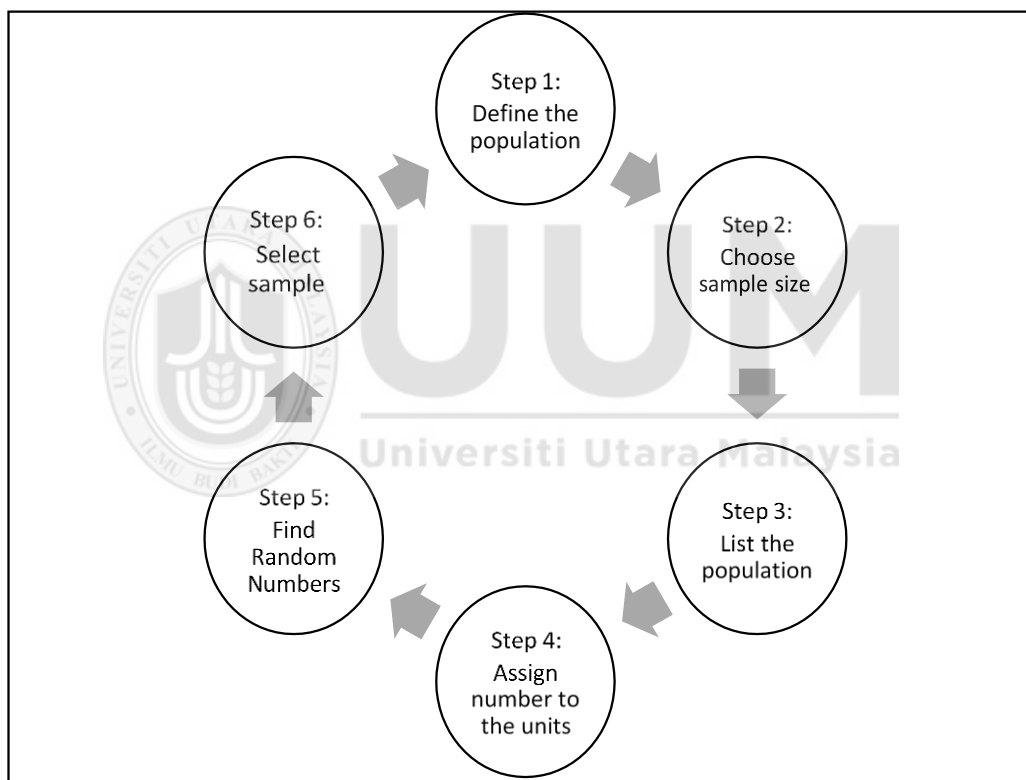


Figure 3.2
Sampling Technique

This research sample was chosen using a basic random sampling selection procedure. The argument for sampling rather than a census study is based on Sekaran and Bougie's (2016) statement that a research sample rather than the entire population is more likely to yield reliable results since weariness is reduced and data collection errors are reduced. Basic random sampling is chosen for its

accuracy, accessibility, slight bias, and generalizability. The questionnaires were self-administered and handed to businesses by hand, with some being followed up with emails to ensure a high response rate.

3.6 Instrument Development

For the instrument development of a questionnaire, all these measures of the current study were validated and, therefore, adapted from different resources found in the literature. Adapting an instrument from the original authors requires more substantial changes than adopting an instrument.

This study follows the general design of other instruments but some items have been modified based on the suitability of this study, that is, there are items added, items removed, and item content changed. They were selected according to the criterion of Cronbach's Alpha (α) value and relevance to the study proposed. The instrument development is vital for the researcher to fits the research question. Requirements for developing measurement instruments (questionnaires) are:

- i. Clearly define the construct of the measurement instrument;
- ii. Conduct a pilot study to test the measurement instrument;
- iii. Determine the validity of the measurement instrument.

The researcher used five steps to develop a questionnaire, including preliminary writing, content validity, pilot test (Appendix C), item analysis, discriminative validity, and reliability (Uggioni & Salay, 2013). For this research, the researcher has done by following the basic framework as shown in Figure 3.3:

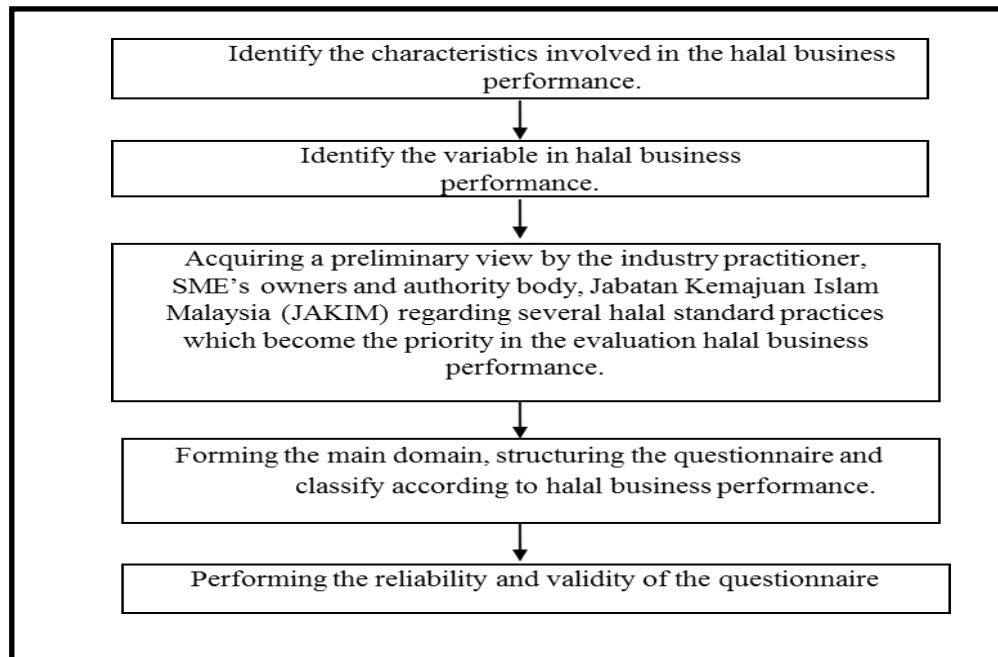


Figure 3.3
Framework for Questionnaire Development

3.7 Research Instrument Measurements

This study employed a self-administered questionnaire to measure independent, dependent, and moderator variables. Self-administered questionnaires are those in which respondents, whether or not in the presence of the researcher, are responsible for both readings and responding to the questions (Creswell, 2013; Zikmund et al., 2010). It's also the natural way to measure intangible characteristics, like asking people to answer questions about their personalities or behaviors. As a result, the most common data collection method in business and management research is the self-administered questionnaire. This study used a survey method using a questionnaire to obtain information from respondents. A questionnaire is an instrument of the survey method of this study to receive information from halal food manufacturers in Malaysia (Appendix D). The questionnaire contains six sections:

- i. Section one (1) requires the demographic profile of the company to consist of

twelve (12) items

- ii. Section two (2) requires a machine- technology consists of five (5) items measuring, and innovation consists of four (4) items measuring
- iii. Section three (3) needs of a people- top management consisted of five (5) items measuring, and organizational readiness consisted of five (5) items measuring
- iv. Section four (4) requires an environmental factor- government support consisted of five (5) items measuring, and halal market demand consisted of five (5) items measuring
- v. Section five (5) requires knowledge management composed of six (6) items measuring
- vi. Section six (6) needs an of the business performance consisting of twelve (12) items measuring

The questions used for all variables were based on an interval scale and employed a Likert rating from 1 to 5 to denote the following; Strongly Disagree (1), Disagree (2), Neither Agree nor Disagree (3), Agree (4), and Strongly Agree (5). Each instrument's internal consistency reliability value was based on the results from previous studies. Even though an Alpha coefficient of 0.70 or higher is accepted (Bryman & Cramer, 1990), the generally accepted limit for Cronbach's Alpha of 0.60 as recommended by Nunnally (1978), and Hair et al. (2019) was considered reliable and adopted for this study.

3.8 Operational Definition and Measurement of the Variables

The following Table 3.1 presents the operational definitions of the latent constructs used in this study based on the literature review.

Table 3.1
Latent Constructs and Their Definition from Literature

Latent Construct Name	Definition
Technology	Technology is equipment or tools for SMEs to operate the halal productions and manufacturing to achieve the halal standard.
Innovation	Innovation is innovative activities and processes in machines, and the process of invention transforms a firm's internal capabilities.
Top Management	Top management is the support, education and training given to employees, beside the providing empowerment, information and knowledge, policy and procedures.
Organizational Readiness	Organizational readiness is the capability of the SMEs to adopt HMS and understand the operations and comply with the halal standards.
Knowledge Management	Knowledge management is the management activities in sharing of knowledge, awareness and understanding of the halal concept and practices in halal productions and manufacturing.
Government Support	Government support is the government roles which include planning, developing, implementing, regulating, promoting, and educating the SMEs in halal productions and manufacturing.
Halal Market Demand	Halal market demand is the customers' needs and wants from SMEs in SMEs in halal productions and manufacturing.
Business Performance	Business performance is both financial and non-financial performance including profitability, productivity, growth, stakeholder satisfaction, market share, and competitive position of halal SMEs' productions and manufacturing.

3.8.1 Technology

Technology is operationally defined as equipment or tools for SMEs to operate the halal productions and manufacturing to achieve the halal standard. Five (5) items were used to measure technology as a unidimensional construct on a five-point Likert scale ranging from 1-Strongly Disagree to 5-Strongly Agree (See Table 3.2). The measurement of this study was adapted from Haleem et al. (2019), Iskandar et al. (2012), and Ngah et al. (2018, 2019).

Table 3.2
Measurement Scales of Technology

No	Items	Source
1.	Equipment that aligned with the halal standard requirements	Ngah et al. (2018), Iskandar et al. (2012)
2.	Tools that assisted in producing more output	
3.	Technology that improved the production control	
4.	Technology that reduced the production costs	
5.	Technology that increased output quality in manufacturing processes.	

3.8.2 Innovation

Innovation is operationally defined as innovative activities and processes in machines, and the process of invention transforms a firm's internal capabilities. The measurement of this study was adopted from Haleem et al. (2019), Iskandar et al. (2012), and Ngah et al. (2018), was employed using a five-point Likert-type scale ranging from 1' Strongly Disagree to 5' Strongly Agree was used. The items are listed in Table 3.3 below.

Table 3.3
Measurement Scales of Innovation

No	Items	Source
1.	Innovated the products to comply with the halal standard	Haleem et al. (2019), Iskandar et al. (2012), Ngah, et al. (2018).
2.	Innovated the process to comply with the halal standard	
3.	Innovated the products to align with quality requirements.	
4.	Innovated tools to increase the productivity	

3.8.3 Top Management

Top management is operationally defined as the support, education and training given to employees, beside the providing empowerment, information and knowledge, policy and procedures. The measurement of top management in this study, a five (5) item

measurement scale designed by Azmi et al. (2019), Fernando and Walters (2015), and Ngah et al. (2018) was employed using a five-point Likert- type scale ranging from 1' Strongly Disagree to 5' Strongly Agree was used. The items are listed in Table 3.4 below.

Table 3.4:
Measurement Scales of Top Management

No	Items	Source
1.	Top management maintains halal standard	Azmi et al. (2019), Fernando and Walters (2015), Ngah et al. (2018).
2.	Top management invests budget on halal standard	
3.	Top management is concerned about the halal standard implementation	
4.	Top management provides halal training to employees	
5.	Top management offers strategy realignment on halal standard	

3.8.4 Organizational Readiness

Organizational readiness is operationally defined as the capability of the SMEs to adopt HMS and understand the operations and comply with the halal standards. This study was adopted from Azmi et al. (2019), and Tarmizi et al. (2014) on the measurement's items, in terms of the organizational readiness toward SMEs' halal business performance was employed using a five-point Likert- type scale ranging from 1' Strongly Disagree to 5' Strongly Agree was used.

Table 3.5 shows that five items were measured.

Table 3.5
Measurement Scales of Organizational Readiness

No	Items	Source
1.	Employee awareness of new technology in production	Azmi et al. (2019), Tarmizi et al. (2014)
2.	Employee adapts innovation for new product development	
3.	Employee understands the operations for halal standard	
4.	Employee understands halal system documentation and record	
5.	Employee complies with halal standards in production	

3.8.5 Government Support

Government support is operationally defined as the government roles which include planning, developing, implementing, regulating, promoting, and educating the SMEs in halal productions and manufacturing. Government support in this study was measured based on the adopted scale from a previous study by Azmi et al. (2019), and Zailani et al. (2015), which was employed using a five-point Likert-type scale ranging from 1' Strongly Disagree to 5' Strongly Agree was used. The five items used to measure government support are listed in Table 3.6 below.

Table 3.6
Measurement Scales of Government Support

No	Items	Source
1.	Government's financial support	Azmi et al. (2019), Zailani et al. (2015)
2.	Government's infrastructures for halal standard implementation	
3.	Government's support for halal business	
4.	Information from the government on halal expansion opportunities	
5.	Benefits from the government's engagements through halal training and conference	

3.8.6 Halal Market Demand

Halal market demand is operationally defined as the customers' needs and wants from SMEs in SMEs in halal productions and manufacturing. Halal market demand in this study was measured based on the adopted scale from a previous study by Azmi et al., (2019), Fernando et al. (2015), and Zailani et al. (2015). The five items used to measure halal market demand are listed in Table 3.7 below.

Table 3.7
Measurement Scales of Halal Market Demand

No	Items	Source
1.	Market demand for halal food	Azmi et al. (2019), Fernando et al. (2015), Zailani et al. (2015).
2.	Preferences of products when implementing halal standard	
3.	Market demand for current halal production	
4.	Market demand for the future halal market	
5.	Community pressures for halal-certified production	

3.8.7 Knowledge Management

Knowledge management is operationally defined as the management activities in sharing of knowledge, awareness and understanding of the halal concept and practices in halal productions and manufacturing. Knowledge management in this study was measured based on the adapted scale from a previous study by Parhan and Rishawati (2015). The six items that were used to measure knowledge management are listed in Table 3.8 below.

Table 3.8
Measurement Scales of Knowledge Management

No	Items	Source
1.	Awareness on <i>Halalan Toyyiban</i> based on Shariah	Parhan and Rishawati (2015)
2.	Knowledge of hygiene, sanitation, and safety for halal standard	
3.	Knowledge of improvement goals in halal	
4.	Realization of technology on halal standards adoption	
5.	Knowledge of halal and safety standards practices.	
6.	Consciousness of halal integrity in production	

3.8.8 Business Performance

Business performance is operationally defined as both financial and non-financial performance including profitability, productivity, growth, stakeholder satisfaction,

market share, and competitive position of halal SMEs' productions and manufacturing. Halal business performance in this study was measured based on the adapted scale from a previous study by Masrom et al. (2017) and Nurul (2020). The twelve items that were used to measure halal business performance are listed in Table 3.9 below.

Table 3.9
Measurement Scales of Halal Business Performance

No	Items	Source
1.	Increased in sales	Masrom et al. (2017), Nurul (2020).
2.	Improved in profitability	
3.	Improved market share	
4.	Better financial liquidity	
5.	Increased production delivery speed	
6.	Increased production volume	
7.	Increased production capacity flexibility	
8.	Improved conformance of quality	
9.	Better brand image	
10.	Increased consumers satisfaction	
11.	Increased consumer loyalty	
12.	Improved business competitiveness	

3.9 Validity

The validity assesses how well a produced instrument assesses the specific notion it is supposed to measure. Validity refers to whether or not the researcher is measuring the correct idea. Meanwhile, Sahin and Topal (2018) defined a measurement instrument's validity as the degree to which it accurately measures. Validity is vital for researchers to ensure that the data obtained accurately reflects the research's purpose and premise. Face validity, content validity, criterion

validity, and concept validity are one of four techniques for improving validity in general. Most researchers employed only content validity and constructed validity in their studies.

Content validity aims to ensure that the measure has a good and representative set of items to test its reliability. The bigger the number of scale items representing the domain or universe of the notion being measured, the more content validity is (Sekaran & Bougie, 2016). Content validity determines how thoroughly a concept's dimensions and elements have been defined. A panel of judges could attest to the content validity of a designed instrument. On the other hand, construct validity assesses how well the results acquired using the measure are relevant to the developed theories. Convergent and discriminant validity can be used to evaluate it. Convergent validity is established when the scores obtained with two different instruments measuring the same concept are correlated. In contrast, discriminant validity is shown when the two variables are predicted to be uncorrelated, and the scores obtained by measuring them are empirically uncorrelated.

Correlational analysis, factor analysis, multi-traits, and multi-methods matrix of correlations can all be used to test construct validity. This study used correlation and confirmatory factor analysis (CFA) to determine validity. The average variance extracted (AVE) was used to assess the reflective constructs' convergent validity. In contrast, the Fornell-Larcker criterion and cross-loadings were used to assess discriminant validity (Hair et al., 2019).

3.10 Reliability

The dependability of a measure is the degree to which it is error-free (i.e., without bias), ensuring consistent measurement over time and across the many components in an instrument. In other words, a reliability measure indicates the stability and consistency with which an instrument assesses a notion and aids in evaluating a measure's 'quality.' The internal consistency of the adapted constructs was measured using composite reliability (CR). Inter-correlations among items assessing each idea were used to calculate the measurements (Sekaran & Bougie, 2016).

3.11 Pretest and Pilot Study

3.11.3 Pretest

The content validity of an instrument is typically achieved by a thorough analysis of the instrument by experts familiar with the construct of interest or experts on the research subject. The development of the instrument needs to be detailed and structured. It involves several mainstages: content validity assisted by experts in related fields, the development of the related criterion, and construct validity followed by a reliability test. The validity of a questionnaire can be established using a panel of experts who explore theoretical constructs (Cooper & Schindler, 2014). Reliability has to do with the accuracy and precision of a measurement procedure, while validity refers to the extent to which a test measures what it wished to measure.

Therefore, it is vital to provide evidence of validity and show that the measure is reliable in a scientific study. The current research pretested the questionnaire with experts, practitioners, and authorities related to the research field

and the subject matter. The preliminary questionnaires are distributed through email and hard copies. In this research, four (4) academicians are consulted to review the questionnaires.

Three (3) experts come from JAKIM staff are also identified to assist with the pretested questionnaire. Given the importance of the expert review process, they have experience in persuasive business performance and halal management. Together with that, several three (3) practitioners from the SME owners are identified for questionnaire checking and input for the relevance and suitability of the questionnaire. They are asked about the questionnaire's readability, clarity, and comprehensiveness. As mentioned by Kabir, (2016), the clarity of questionnaire presentation can also help improve the ease with which interviewers or respondents can complete a questionnaire. Furthermore, the panelist also identified the deficient areas and provided feedback and suggestions on ways to ensure clarity.

The researcher cross-checked the validity of the questionnaire and reached a level of agreement on the final questionnaire. Then, researchers rush through the process of validation with little appreciation for its enormous importance, only to find that their instrument does not work for construct validity or internal consistency reliability when the response data is obtained. Therefore, the new or adjusted instrument needs to be re-evaluated based on the reliability test, with more evidence supported by construct validity through the pilot test.

3.11.4 Pilot study

A pilot test can be defined as a small sample of individuals who are similar to those for whom the instrument is designed. This trial version is tested by performing a construct validity and reliability test to discover any limitations in the fundamental

study. A revised version will be pilot-tested on a convenience sample of 10 to 30 SMEs. Sekaran and Bougie (2016) stated in research with tight experimental controls (matched pairs, etc.), successful research is possible with samples as small as 10 to 20. According to Connelly (2008), extant literature suggests that a pilot study sample should be 10% of the sample project for the more extensive parent study (10% from 200 respondents is 20 companies).

Nevertheless, Isaac and Michael (1995) suggested 10 – 30 respondents; Hill (1998) suggested 10 to 30 respondents for pilots in survey research, Bell (2015) suggested 12, and Treece and Treece (1982) indicated 10% of the project sample size. The researcher distributed 30 questionnaires; then, the questionnaire took approximately 10–15 min to complete, and they provided feedback on any misleading and confusing question items. The suggestions from the respondents included reformulating and rewording some items and removing potentially repetitive ones. All reported feedback is sent to correct necessary actions. Questions are removed or modified based on these suggestions. The pilot test was conducted with a small group of SMEs representative to improve the clarity of the questions. The results are shown in Appendix E.

3.12 Data Collection Procedure and Data Analysis

The respondents in this study were the top management, middle management, and lower management of SME food manufacturers. The unit of analysis was the organization represented by the managers. Self-administered questionnaires were used and they were randomly distributed to the sample. This study obtained data from SMEs in Malaysia where they were located. Although the pilot test was done face to face, the actual data collection i.e., the questionnaires were distributed via

social media (electronic mail, LinkedIn, and WhatsApp). This is due to the movement control order (MCO) by the government to manage the pandemic Covid-19. MCO started in March 2020 and restrained the researcher from the fieldwork to distribute the survey using face-to-face.

Surveys and tests may be sent out fast to anybody with access to the internet. Data can be automatically saved electronically, saving money, dedicated equipment, paper, shipping costs, and workforce. Data can be saved in a form ready for analysis once an experiment or survey has been properly designed, saving data coding and entry costs, which used to be an expensive and time-consuming element of the research process. Some works discuss the advantages and possible drawbacks of Web-based research (Dillman, 2007).

The researcher drafted a formal letter from Universiti Utara Malaysia (UUM) containing a questionnaire and distributed the questionnaire online. After receiving authorization to collect data, survey questionnaires were distributed. The number of questionnaire sets was allocated based on the number of respondents in each “ n ” element, which was determined through random sampling.

Hence, a total of 200 questionnaires were systematically distributed to the respondents. This is done by the face-to-face contacts with the respondents based on the sample determination. Some of the respondents they agreed to answer on the spot and some of them need more time to answer the questionnaires. On average, the respondents were given two weeks to respond to the questionnaires. However, few was extended by another month to manage the MCO-caused delay, and the researcher had to send the reminders through email, and some were collected during the pandemic with a special request from the authorities. The questionnaire consisted of a cover letter, which gave a clear explanation of the research purpose, assurance of confidentiality, and anonymity of the respondents.

The researcher also offered the respondents a summary of the findings to those who were interested. The respondents were well-informed about the usage of data for academic purposes. Consequently, the duration of the data collection procedure was from December 2020 to June 2021. The response rate was 69.5%, which 139 answered the questionnaires completely and can be used for further analysis.

The study applied a Partial Least Squares Structural Equation Modeling (PLS-SEM) approach with the use of Smart-PLS software 3.2.8. The reason was that PLS-SEM was used to evaluate the measurement model, test the structural model, and prioritize the exogenous variables through importance-performance map analysis (IPMA). PLS-SEM was selected because of the exploratory nature of this research. PLS-SEM can also accommodate structural modeling with a small sample size since this research used a small sample size. The Statistical Package for the Social Sciences (SPSS) was also used to analyze the respondent's profile, including frequency and percentage, means, and standard deviations. The PLS-SEM method appeals to many researchers, enabling them to estimate complex models with many constructs, indicator variables, and structural paths. It also emphasizes prediction in assessing statistical models, whose structures are designed to provide causal explanations (Hair et al., 2019).

The researcher also determined the situations in which small sample sizes were acceptable using PLS-SEM. This is consistent with the assertions of numerous researchers that the absence of distributional assumptions is the primary rationale for selecting PLS-SEM (Ali et al., 2018; Hair et al., 2019).

There are several advantages of using Smart-PLS for testing hypotheses in this study (Appendix E). First, PLS modeling is known as the suitable analysis for relatively complex models with a large number of indicators or latent variables and

accommodates a study that involves complex model set-ups which are easily conceivable such as estimation of moderating effects, mediating effects or hierarchical components models and as well it involves in formative second-order variables (Becker et al., 2012; Hair et al., 2019).

Second, PLS-SEM is applicable in a situation involving the relationship between latent variables and their measurement that needs to be measured in different ways (formative and reflective). Since the study was modeled with both formative and reflective measures, it was necessary to apply PLS-SEM to examine the formative constructs. Unlike CB-SEM, which aims to confirm theories by determining how well a model can estimate a covariance matrix for the sample data, PLS-SEM operates much like a multiple regression analysis (Becker et al., 2012; Hair et al., 2019). This characteristic makes PLS-SEM particularly valuable for exploratory research purposes. According to Hair et al. (2017):

“PLS is primarily intended for research contexts that are simultaneously data rich and theory-skeletal. The model building is then an evolutionary process, a dialog between the researcher and the computer. In the process, the model extracts fresh knowledge from the data, thereby putting flesh on the theoretical bones. At each step, PLS rests content with the consistency of the unknowns (p.1)”.

Third, PLS-SEM has less restriction on assumptions as data distribution does not require normality, small sample sizes, and formative measured constructs. For example, the minimum sample size for a PLS model should be equal to the larger of the following; ten times the largest number of formative indicators used to measure one construct; or ten times the largest number of inner model paths directed at a particular construct in the inner model (Barclay et al.,

1995).

Finally, PLS-SEM path modeling can handle problematic modeling issues that routinely occur in the social sciences such as unusual data characteristics (e.g. nonnormal data) and highly complex models. In addition, PLS-SEM has been widely recognized and used in many academic disciplines including marketing, strategic management (Hair et al., 2017), management information systems (Ringle et al., 2012), operations management (Peng & Lai, 2012), and accounting (Lee et al., 2011). Thus, the employment of the SmartPLS version 2.0 (3M) for the data analysis in this study is justified (Ringle et al., 2005).

The data analysis process started with coding and entering data in the SPSS. The data were then screened and cleaned by detecting and replacing the missing values and testing and treating outliers (extreme values). By using PLS-SEM, the assessment of validity and reliability was done through examination of the measurement model followed by the structural model with the bootstrapping procedure of 1000 samples. The results were interpreted from the path coefficient (Beta) and value, R^2 value, effect size (f^2), and by predictive relevance (Q^2) of the structural model (Hair et al., 2017). For the final stage, the mediator relationship was analyzed by bootstrapping indirect effect as general suggestions of mediation analysis, followed by the mediator relationship as the interaction results produced by the bootstrapping procedures (Hair et al., 2019).

3.12 PLS-SEM Path Modeling

The measurement and structural models were assessed using PLS-SEM. The use of PLS-SEM in this study came with several advantages. PLS-SEM can accept and works very well with smaller sample size, no assumption on the non-normality

data, is capable of running data measurement with both reflective and formative items, handle single-item constructs, and implies no identification problems. PLS-SEM is also known to be efficient in estimating parameters, resulting in higher statistical power than the CB-SEM (Hair et al., 2017). Thus PLS-SEM receives the most and highest ranking of popular and favorable approaches to researchers from various disciplines.

In addition, PLS path modeling provides more accurate estimates of mediating effect by accounting for the measurement error that attenuates the estimated relationships and improves the validation of theories (Helm et al., 2010; Henseler & Fassoft, 2010). Akter et al. (2014) stated this approach also allows us to derive the (indirect) effects of lower-order constructs, or dimensions, on outcomes of the higher-order construct. Structural equation modeling (SEM) enables researchers to incorporate unobservable variables measured indirectly by indicator variables. It also facilitates accounting for measurement errors in observed variables (Chin, 1998).

There are two types of SEM. First is Covariance-Based SEM (CB-SEM) which is primarily used to confirm (or reject) theories (i.e., a set of systematic relationships between multiple variables that can be tested empirically). It does by determining how well a proposed theoretical model could estimate the covariance matrix for a sample dataset. Second is PLS-SEM which is primarily used to develop theories in exploratory research. This applies by focusing on explaining the variance in the dependent variables when examining the model. PLS modeling is a favorable approach for estimating complex models because it can ensure more theoretical parsimony and less model complexity.

PLS path modeling also delivers robust solutions, especially when the objective is prediction, the model is relatively complex, the sample size is small, and the phenomenon under studying is new or changing. This study employed PLS-SEM due to the presence of the second-order formative constructs. It is also beneficial to use the PLS-SEM as the more perfect statistical technique rather than the use of Covariance Based SEM (CB-SEM) or others. Therefore, Therefore PLS-SEM was used for the assessment of the measurement model and the evaluation of the structural model. The study applied a two-step process of PLS Path Model Assessment as suggested by Hair et al.(2019), and Henseler et al. (2009).

3.13 Chapter Summary

This chapter discussed the methodology used in the study, especially the research design and the employment of the quantitative method. The chapter clearly defined the population and the sampling frame and determined the sample size to represent the population. Questionnaire design and instrumentations were described, which were adapted from the previous studies. In addition to that the validity and reliability were explained. The pilot testing, together with the procedures of data collection, were also discussed. Finally, data analysis using SPSS and PLS-SEM was justified. It helps to examine the systems' interaction effect on the business performance of SME halal food manufacturers.

CHAPTER FOUR

RESULTS AND INTERPRETATIONS

4.1 Introduction

This chapter elaborates on the main procedure applied to analyze the data to generate the findings. The data screening and preliminary analysis were presented, identifying missing values, outliers, normality, and multicollinearity effects. The descriptive statistics are presented to elaborate the composition of companies and respondents in this research. The measurement model involves convergent validity, discriminant validity, composite reliability, and Average Variance Extracted (AVE) criteria. The structural model was assessed to determine the significance of the path coefficient of determination (R^2), effect sizes (f^2), predictive relevance (Q^2), and effect sizes (q^2) criteria. The hypotheses result of complementary PLS-SEM analysis were tested in direct and mediating paths using bootstrapping procedures.

4.2 Data Screening

First, a data screening process was performed to explore the characteristics and verify the accuracy of the data. It is used to check for any missing information, patterns of missing data, and extreme responses. It helps the researcher to identify, the appropriateness of numerical codes for each variable used in the study, analysis of outliers, a normality test of data distribution, and a multicollinearity test (Hair et al., 2017; Jeje, 2020). The initial phase in the analysis is to investigate the overall responses by screening the responses' patterns. These responses may raise a flag to be eliminated if they have a suspicious

or systematic pattern, such as straight lining, diagonal linings, or alternating extreme pole response (Hair et al., 2017). Against this background, zero (0) cases with this criterion were removed before further analysis was conducted.

In addition, many screening questions ensured only those who comply with prescribed measures are invited to participate in the data analysis process. These questions among the food manufacturer's SMEs that complied with the identified questions are accepted. Based on that, the number of these questions eliminated in the early stage of data screening was three (3) cases and considered not valid responses.

4.3 Response Rate

The strategy to distribute the questionnaire is to use the hard-copy and online versions. Experts in survey research indicate that multimode approaches in survey delivery provide superior response rates to single-mode approaches (Hill, 1998). The advantages of and need for increased use of internet surveys through online surveys. Following the recommendation of Dillman (2007), an internet version of the survey instrument was developed.

Out of two hundred (200) online questionnaires sent to the SME food manufacturers, hundred and thirty-nine (139) responses were successfully received, yielding a response rate of 70%. Hence, a valid 70% response rate was qualified for the analysis in this study based on the criteria discussed in Sekaran and Bougie (2016). They also suggested that a response rate of 30% is adequate for surveys. Hence, a valid 70% response rate was qualified for this study's analysis. In addition to that, Kline (2016) offered guidelines for determining the sample size for analyzing structural equation models.

The study stated that a sample of 100 is considered small, a sample of 100 to 200 is medium, and a sample over 200 is considered large. Nevertheless, Kline (2016) recognized that a sample of 200 may be too small for a complex model with non-normal distributions, particularly for those using estimation methods other than maximum likelihood. Also, any sample below 100 cases may not be recommended for any SEM technique unless it analyzes a straightforward model (Kline, 2016).

Therefore, the current study assessed the model complexity when deciding on the sample size estimation. After the initial screening, the number of returned responses obtained was 139. Table 4.1 shows the distribution of questions based on the regional state of the respondents. The results revealed that most respondents are from Central Region (48%), followed by Northern Region (45%), then the Eastern and Southern Regions with 18% and 16% respectively, and equally a percentage of 6% were from Western Region and East Malaysia.

Table 4.1
Distribution of Questionnaire

Regional State	Frequency	Percentage (%)
Northern Region	45	32
Southern Region	16	11
Central Region	48	35
Eastern Region	18	13
Western Region	6	5
East Malaysia	6	4
	139	100

4.4 Demographic Distribution of the Respondents

Table 4.2 shows the demographic profile of the respondents. The results revealed that most, females answered the survey (55.2%), whereas males were 44.8%. In terms of age, the majority of the respondents were in the range of 18 and 30 years, with 37.1 %. They were followed by the respondents aged between 31 and 40 years

old (32.2%). Then a percentage of 21.7% was between 41 and 50 years old, and finally, only 9% of respondents were above 50 years old.

In terms of educational level, the majority of respondents obtained *Sijil Pelajaran Malaysia* (SPM) (37.2%), followed by a bachelor's degree (32.7 %), then a diploma (24.6%), and a master's (3.5%). Only 2% of the respondents were qualified with a Doctor of Philosophy (Ph.D.).

Regarding tenure with the company, the results revealed that employees with working experiences with the company between 2 and 5 years, i.e., 40.1%, were the most. This is followed by more than 10 years of tenure (21.9%). The results represented 21.1% of respondents with less than 2 years of working experience. Finally, only 16.9% of respondents got tenure between 6 and 10 years.

Table 4.2
Respondent's Demographic Profile

Demographic Variable	Category	Frequency	Percentage (%)
Gender	Male	63	44.8
	Female	76	55.2
Age (years)	18-30	52	37.1
	31-40	45	32.2
	41-50	30	21.7
	50 and above	12	9
Education	SPM	52	37.2
	Diploma	34	24.6
	Bachelor Degree	45	32.7
	Master Degree	5	3.5
	Doctor of Philosophy (PhD).	3	2
Tenure with this company	Less than 2 years	29	21.1
	2-5 years	56	40.1
	6-10 years	23	16.9
	More than 10 years	30	21.9
Total		139	100

Table 4.3 shows that most of the respondents were the owner with 49%. This is followed by a senior manager (39.5%). Then, the Chief Executive Officer or Managing Director was 11.5%. For the company's size (sales turnover), most of the company (58.3%) had less than RM300,000 annual sales turnover. This is followed by 32.3 percent of the company with between RM300,000 to RM15 million annual sales turnovers. Then 7.2% had more than RM15 million to RM50 million annual sales turnovers. Finally, only 2.2% obtain more than RM50 million in sales turnover per annum.

Table 4.3
Respondents Category

Position	Frequency	Percentage (%)
CEO/ Managing Director	16	11.5
Owner	68	49.0
Senior Manager	55	39.5
Sales Turnover	Frequency	Percentage (%)
Less than RM300,000	81	58.3
RM300,000 to RM15 million	45	32.3
More than RM15 million to RM50 million	10	7.2
More than RM50 million	3	2.2
Company's size/employees	Frequency	Percentage (%)
5 to less than 75	107	77
75 to less than 200	23	16.5
More than 200	9	6.5
Total	139	100

Table 4.4 shows the respondents' company location. The majority of respondents come from Selangor, with 19.5%. Then from Pulau Pinang with 14%. Average respondents between 2% and 6%, come from Melaka, Negeri Sembilan, Pahang, Perak, Perlis, Sarawak, Terengganu, and Kuala Lumpur. The smallest number of respondents comes from Sabah with 1.4 %.

Table 4.4
Respondents' Company Location

Company Location	Frequency	Percentage (%)
Johor	16	11.2
Kedah	17	11.9
Kelantan	14	9.8
Melaka	5	3.5
Negeri Sembilan	4	2.8
Pahang	6	4.2
Perak	8	5.6
Perlis	8	5.6
Pulau Pinang	20	14
Sabah	2	1.4
Sarawak	4	2.8
Selangor	27	19.5
Terengganu	6	4.2
Wilayah Persekutuan (Kuala Lumpur)	5	3.5
Total	139	100

4.4 Multivariate Normality Test

According to Kline (2011) data distribution was within acceptable range when the zscore of univariate skewness were not exceeding ± 3 and univariate kurtosis were not beyond ± 7 . Meanwhile, Cain et al. (2017) and Mardia (1970) asserted that z-score of multivariate skewness ranging from -3 to +3 and multivariate kurtosis ranging from -20 to +20 indicates the data as normally distributed. Table 4.5 shows that there are five variables which displays for univariate normality $\leq \pm 1$ and kurtosis $\leq \pm 7$. From the total of 139 variables, univariate skewness ranged from -0.240 to 1.026 and univariate kurtosis from -0.111 to -1.155. Five variables which displays for multivariate normality $\leq \pm 3$ and kurtosis $\leq \pm 20$. From the total of 139 variables, multivariate skewness ranged from -

11.27115 to 261.115007 and multivariate kurtosis from 39.24949 to 2.994094. Percent of significant skewness is 66% and kurtosis is 54% by sample size are percent of the variables are thus normally distributed. It is concluded that the sample data is not multivariate normal but instead displays mild non-normality, whilst the overall data distribution meets the criteria for normality.

Table 4.5

Multivariate Normality Test

(a) Output of skewness and kurtosis calculation						
Sample size: 139						
Number of variables: 5						
Univariate skewness and kurtosis						
	Skewness	SE_skew	Z_skew	Kurtosis	SE_kurt	Z_kurt
MCH	-0.721	0.206	-3.509	-0.135	0.408	-0.331
HBP	-0.351	0.206	-1.705	-0.613	0.408	-1.501
PPL	-0.240	0.206	-1.169	-1.155	0.408	-2.829
ENVR	-0.579	0.206	-2.816	-0.111	0.408	-0.271
KM	-1.026	0.206	-4.991	0.414	0.408	1.013
Mardia's multivariate skewness and kurtosis						
	b	z	p-value			
Skewness	11.27115	261.115007	0.000000000			
Kurtosis	39.24949	2.994094	0.002752607			

4.5 Common Method Variance

4.5.1 Full Collinearity

Common method variance (CMV), also known as mono method bias, refers to the variance that is attributable to the measurement method rather than to the construct of interest (Podsakoff et al., 2003). This is in good agreement with many researchers that CMV is a critical problem of the measurement validity in self-report surveys (Lindell & Whitney, 2001; Podsakoff et al., 2003; Spector, 2006). Embedded onto the previous suggestions, some efforts were made to reduce such bias during the instrument development stage, such as modifying item wordings in the questionnaire to avoid vague concepts. A widely used test of common method

bias is the highest full collinearity variance inflation factor (FCVIF) test. Testing of collinearity among independent variables is greatly recommended before testing the proposed model (Hair et al., 2010). Collinearity indicates the existence of a setback in correlation matrix when an independent variable is significantly correlated with another independent variable. According to Hair et al. (2010), the tolerance value is the amount of variability of the chosen independent variable that is not explained by other independent variables whereas the variance influence factor (VIF) is the inverse of tolerance. The tolerance value and variance influence factor's (VIF) cut-off points less than 5.0 respectively. Table 4.5 highlights the collinearity statistics for all the independent variables in the study model. VIF values are shown for the original latent variables, as well as for the interaction latent variables. As it can be inferred from this table, the addition of moderating effects had little impact on the VIF values, with all of them eventually being lower than 5.0. The original VIF values, without the moderating effects, were also all lower than 5: Technology=2.870; Innovation =2.509; Top Management=3.178; Organizational Readiness=3.090; Knowledge Management= 1.771, Government= 1.554; Halal market demand= 1.487 and Business performance=1.000. As expected, all of them increased due to the inclusion of moderating effects.

Table 4.5
Common method variance (CMV)

Variables	Unstandardized		Standardized	t	Sig.	Collinearity Statistics	
	Coefficients		Coefficients			Tolerance	VIF
	B	Std. Error	Beta				
	-.031	.363		-.084	.933		
AVR_TECH	.097	.088	.111	1.098	.274	.348	2.870
AVR_INV	.237	.086	.260	2.768	.006	.398	2.509

AVR_TM	-.062	.105	-.062	-.585	.560	.315	3.178
AVR_OR	.163	.107	.159	1.520	.131	.324	3.090
AVR_KM	.192	.083	.183	2.320	.022	.565	1.771
AVR_GOV	.046	.055	.062	.844	.400	.643	1.554
AVR_HMD	.304	.082	.267	3.691	.000	.673	1.487
AVR_BP	.595	.065	.618	9.202	.000	1.000	1.000

a. Dependent Variable: AVR_BP

4.6 Measurement Model Assessment Procedure

The path models are developed based on two models: the measurement model and the structural model. The measurement model refers to how much each construct is measured (Hair et al., 2017, 2019). There are two types of constructs: reflective and formative constructs. In this research, the reflective measurement construct is used. On the other hand, the structural model is concerned with how the constructs are related to each other in the structural model (i.e., the relationship between their constructs). Additionally, the model studied in this research is visualized in Figure 4.2:

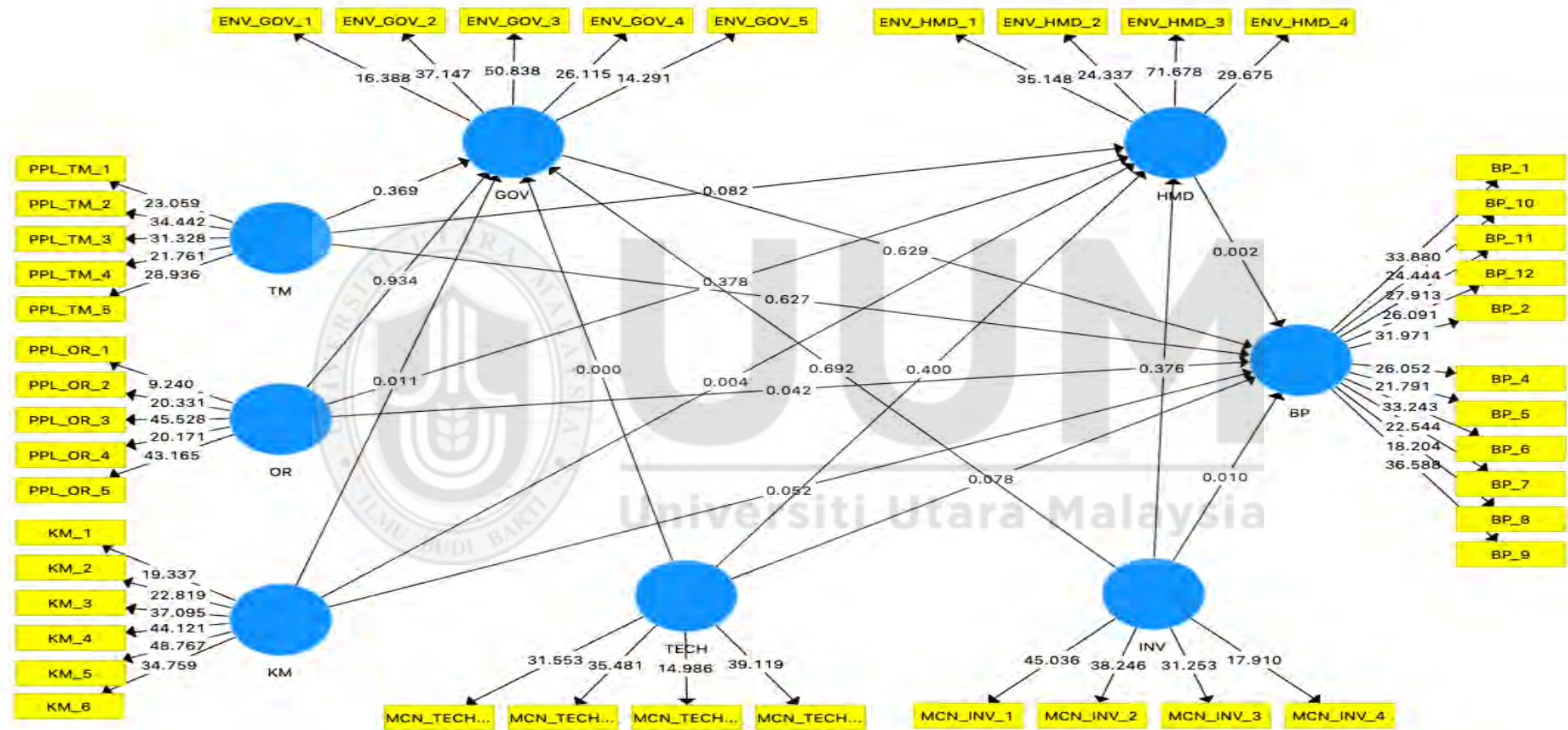


Figure 4.2
Measurement Mode

4.7 Testing the Measurement Model

In the current model, the assessment of the reflective measurement model consists of the convergent validity (i.e., the outer loadings of the latent variables, their reliability, and the Average Variance Extracted (AVE), the internal consistency reliability (i.e., Composite Reliability (CR), and Cronbach's Alpha (Appendix F), and discriminant validity. In this section, the assessment includes all reflective latent constructs of the model, including the Low Order Constructs (LOC), and the composite constructs HOC (High Order Constructs). The approach followed in the assessment is based on the guidelines as recommended by Hair et al. (2017).

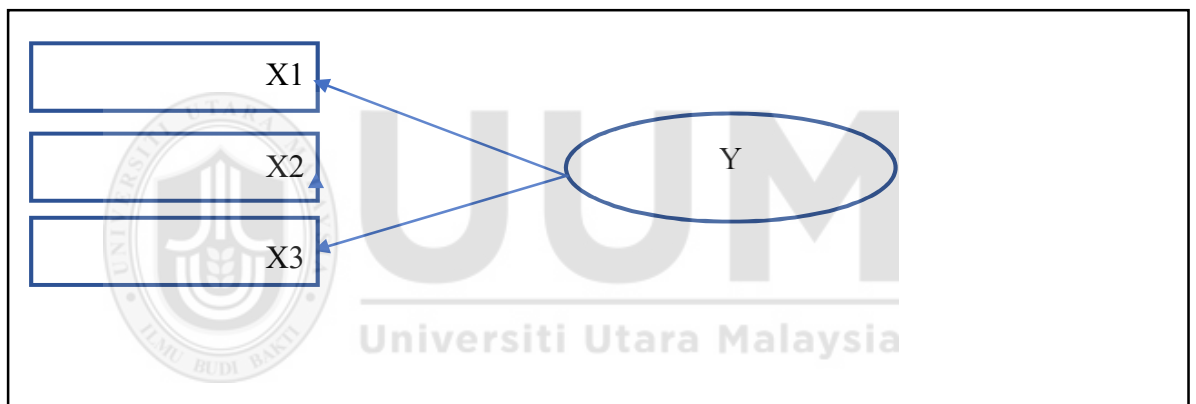


Figure 4.3
Reflective Measurement Model
Source: Hair et al. (2017)

Figure 4.3 shows, the three Y measures (X1, X2, and X3) are interdependent and interchangeable. For example, knowledge management encompasses knowledge sharing, comprehension, and integrity. The variables are interdependent because they are correlated.

Furthermore, going through the evaluation process and referring to Table 4.6 show results of the measurement models, the items show loadings above 0.7 in all the reflective constructs. For all reflective constructs, AVE is higher than 0.5, establishing that more than 50% of the construct's variance is due to its indicators.

Table 4.6
Results' of The Measurement Models

Construct	Items	Loadings	AVE	CR
Business Performance	12	0.871	0.717	0.965
Government Support	5	0.923	0.738	0.933
Halal Market Demand	4	0.940	0.784	0.935
Innovation	4	0.902	0.769	0.930
Knowledge Management	6	0.916	0.782	0.955
Organizational Readiness	5	0.894	0.713	0.925
Technology	4	0.913	0.782	0.935
Top Management	5	0.875	0.724	0.929

4.8 Convergent Validity

Convergent validity is the extent that the indicators, which are the measures of a construct, should correlate positively with other measures or indicators of the same construct and should be on the verge or share a high portion of the variance of the same construct (Hair et al., 2017). The convergent validity is measured by the assessment of the outer loadings and the reliability of a construct in addition to the assessment of AVE. Table 4.5 shows the list of reflective constructs of the model with related values under consideration of the construct validity. For all reflective constructs (Appendix G), AVE is higher than 0.5, establishing that more than 50% of the construct's variance is due to its indicators. Business Performance 0.717, technology (0.782), innovation (0.769), top management (0.724), organizational readiness (0.713), knowledge management (0.782), government support (0.738), and halal market demand (0.784).

Several things have to be taken into consideration about convergent validity. First, outer loadings equal to or above the cut-off value of 0.7 are acceptable and

indicates that the items have much share in common that is captured by the same construct (Hair et al., 2017; Peng and Lai, 2012). Besides, the squared value of the outer loadings of an item, referred to as the commonalities, is the variance that is captured or explained by the construct of that item. This squared value of the standardized item outer loading is called item reliability. The cut-off value of the indicator's reliability is equal to or above 0.5, which indicates that the item's explained variance by the construct is higher than the measurement error of the item (Appendix H).

On the other hand, previous literature suggests outer loadings of an item in the range of 0.5 to 0.7 or higher (Henseler & Chin, 2010) are acceptable and meet the thresholds of reliability and validity. Furthermore, going through the evaluation process and referring to Table 4.7, the items show loadings above 0.7 in all the reflective constructs. It is worth mentioning that in a reflective model, any item could be removed or eliminated if it has loadings less than the thresholds indicated above, or if removing it increases the composite reliability/AVE of the related construct (Hair et al., 2019; Peng & Lai, 2012).

Besides, items in the reflective model are interchangeable and are viewed as equivalent manifestations of the same construct, and removing these items is possible as long as the remaining items have sufficient content that the construct is capturing (Podsakoff et al., 2006). However, all the measurements met the criteria and there was not any need to remove any of the items. Moreover, the AVE of all constructs met the criterion and exceeded the threshold of (0.5). In addition, all items on all latent constructs speak in favor of having reliable measurements and exhibit a value in the range of 0.713 to 0.784, which is more than the cut-off value of 0.5. To further ensure that items are loaded in the intended construct, an assessment of internal consistency reliability was performed in the following section.

Table 4.7
Convergent Validity

Latent Variables	Average Variance Extracted (AVE) (>0.5)
Business Performance	0.717
Government Support	0.738
Halal Market Demand	0.784
Innovation	0.769
Knowledge Management	0.782
Organizational Readiness	0.713
Technology	0.782
Top Management	0.724



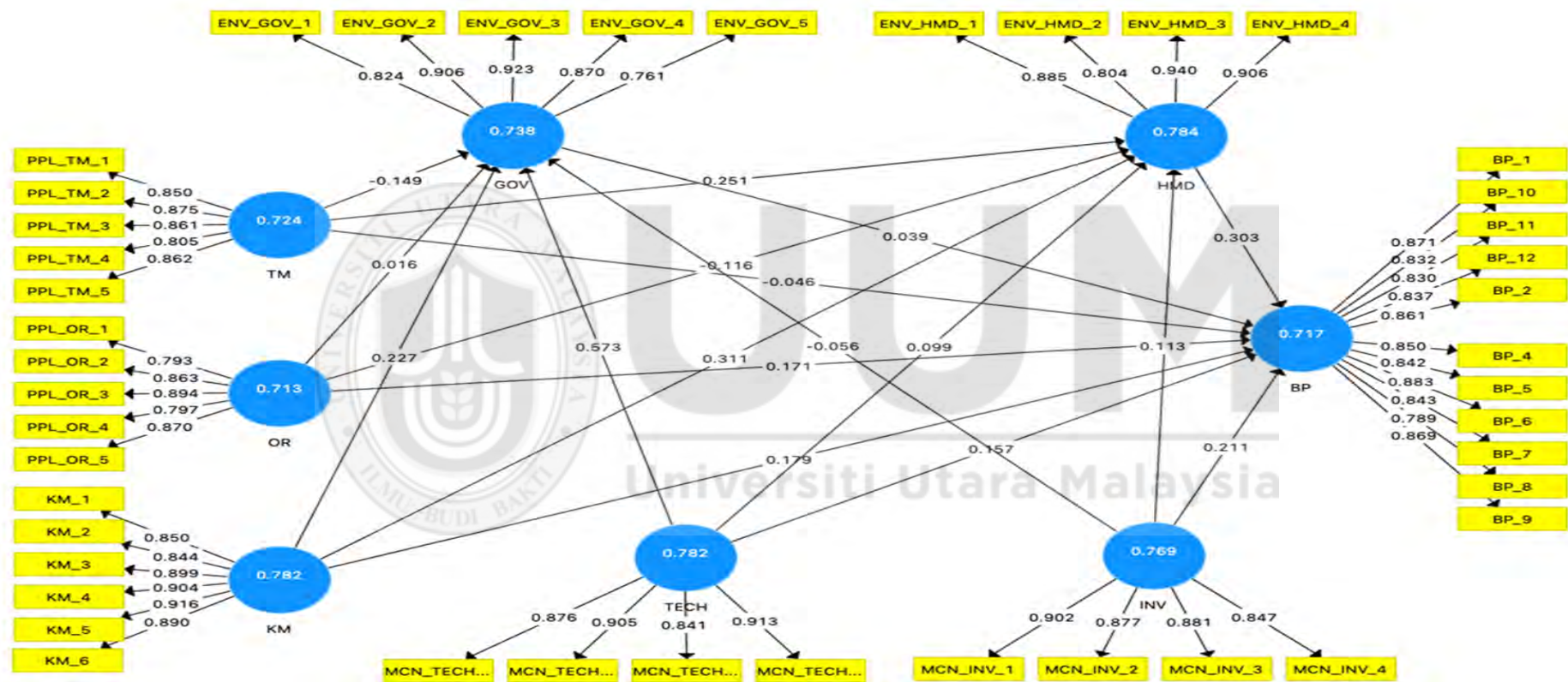


Figure 4.4
Convergent Validity

4.8 Internal Consistency Reliability Assessment

Here, the assessment of internal consistency and reliability consists of the assessment of Composite Reliability (CR) and Cronbach's Alpha. Cronbach's Alpha is the conservative measure of internal consistency reliability and assumes that all indicators are equally reliable and have equal outer loadings on the same construct. The acceptable cut-off values fall in the range of 0.6-0.9 (Hair et al., 2019). Also, Cronbach's Alpha depends on the number of items and, therefore, tends to underestimate internal consistency and reliability.

For these reasons, another measure is used, which is referred to as Composite Reliability. Composite Reliability, however, considers the indicators' different outer loadings (Sarstedt et al., 2014). Moreover, CR is the conservative measure of reliability. Additionally, in explorative research, such as the current study, the cut-off values range from 0.6 - 0.7 are considered acceptable, values in the range of 0.7 - 0.95 are satisfactory, whereas values below 0.6 are deemed to indicate a lack of internal consistency reliability and values above 0.95 are not desirable.

In Table 4.8, the values of both measures are included and meet the satisfactory criteria of CR (0.90 - 0.96) and Cronbach's Alpha in the acceptable range (0.900 - 0.960). Hence, both measures are reasonably considered and reported, as suggested by Hair et al. (2017), to show the lower bound (i.e., Cronbach's Alpha) and the upper bound (i.e., Composite Reliability) of internal reliability and consistency of latent constructs. After this step, further analysis was performed to assess the discriminant validity of the constructs in the following section.

Table 4.8
Internal Consistency Reliability Assessment

Latent Variables	Cronbach's Alpha (range)	Composite Reliability (range)
Business Performance	0.960	0.965
Government Support	0.910	0.933
Halal Market Demand	0.907	0.935
Environment	0.900	0.930
Knowledge Management	0.944	0.955
Organizational Readiness	0.900	0.925
Technology	0.907	0.935
Top Management	0.905	0.929

4.9 Discriminant Validity Assessment

In discriminant validity assessment, the indicators of each construct are examined against another construct to ensure that they are loaded only in the intended construct. To do so, three assessment approaches were used to investigate the discriminant validity of the latent constructs, namely the Heterotrait-Monotrait ratio (HTMT) inference assessment (Appendix I). Therefore, the HTMT was suggested as a remedy for the two previous approaches (Hair et al., 2019; Henseler et al., 2015). Consequently, HTMT inference ratio assessment was used in the current study. The bootstrapping procedure in the SmartPLS M3 program was run to check if the confidence interval range does not include the value of 1 in any of its boundaries, in which the case is accomplished, refer to Table 4.9.

Table 4.9
Discriminant Validity Assessment

	1	2	3	4	5	6	7	8
1. Business Performance	0.847							
2. Government Support	0.416	0.859						
3. Halal Market Demand	0.581	0.365	0.885					
4. Environment	0.619	0.369	0.409	0.877				
5. Knowledge Management	0.543	0.303	0.492	0.472	0.884			
6. Organizational Readiness	0.572	0.346	0.355	0.615	0.475	0.845		
7. Technology	0.567	0.548	0.319	0.695	0.322	0.644	0.884	
8. Top Management	0.539	0.230	0.464	0.604	0.600	0.755	0.462	0.851

4.9 Structural Model Path Coefficients Assessment

The estimates for the hypothesized relationships for the structural model are obtained by running the PLS algorithm, which is the standardized value of path coefficients. The values of path coefficients close to (+1 or -1) are considered strong relationships either positive or negative. On the contrary, the values near (0) are considered weak and normally not significant (Hair et al., 2019). The significance of the path coefficients is obtained by running the bootstrapping routine, which computes the t and p-values in addition to confidence intervals.

Further, the statistical significance is accomplished when the t values are larger than a threshold, which are for the two-tailed tests: 1.65 (at a significance level of 10%), 1.96 (at a significance level of 5%), and 2.57 (at a significance level of 1%). On the other hand, the one-tail critical values are 1.28 (at a significance level of 10%), 1.65 (at a significance level of 5%), and 2.33 (at a significance level of 1%). Moreover, the significance level for the studies that have explorative nature is 100%. In this research used the significant level of 0.10 (10%). This is due to the aware of the unique sample and sample size that was less conventional. The research assessed Fisher's

practice was to designate P a value of 0.05 as a measure of evidence against the null effect. Hence, the study reports 10% statistical significance as a significant result. Fisher (1956) and Wilhelm (2015) stated the level of significance must be chosen based on the entire context. In this study assessed the scientific methods used, and the SMEs context in Malaysia which are unique that have certain issues pertaining the halal business performance. Beside that the objectives and limitations during the MCO, as stated previously, is among the major concerns of the choice.

In critical perspectives of the Fisherian philosophy, the significant level is based on the judgement of the researcher, and based on the researcher's perspective. The action chose by the researcher may different from other researcher and have distinct implications. Hence, in line with Fisher who used the available data to make a first guess at the "significance level" of a result. The current researcher used 90% confidence level for the evidence of the results, as Fisher (1950:80) stated "If P is between 0.1 and 0.9, there is no reason to doubt the tested hypothesis."

Likewise, in addition to that, Giyanti et al. (2021:1593) used p-value <0.10 (less than 0.10) for hypotheses testing on the application of halal standards in SMEs food manufacturing businesses that effects on business productivity.

In the current study, the 90% confidence interval (CI) provides information about the significance of the path coefficients (Appendix J). If the range of CI revealed does not include a zero value, it indicates the statistical significance of the value under consideration. By referring to Table 4.10, the values for different hypothesized relationships between the latent constructs are presented.

Table 4.10
Structural Model Significance Results - Path Coefficient

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P-values
Government Support → Business Performance	0.039	0.039	0.080	0.483	0.629
Halal Market Demand → Business Performance	0.303	0.294	0.098	3.105	0.002
Innovation → Business Performance	0.211	0.198	0.082	2.567	0.010
Innovation → Government Support	-0.056	-0.057	0.142	0.396	0.692
Innovation → Halal Market Demand	0.113	0.097	0.127	0.885	0.376
Knowledge Management → Business Performance	0.179	0.187	0.092	1.941	0.052
Knowledge Management → Government Support	0.227	0.223	0.089	2.551	0.011
Knowledge Management → Halal Market Demand	0.311	0.310	0.108	2.880	0.004
Organizational Readiness → Business Performance	0.171	0.181	0.084	2.035	0.042
Organizational Readiness → Government Support	0.016	0.004	0.195	0.082	0.934
Organizational Readiness → Halal Market Demand	-0.116	-0.118	0.131	0.882	0.378
Technology → Business Performance	0.157	0.165	0.089	1.764	0.078
Technology → Government Support	0.573	0.577	0.137	4.188	0.000
Technology → Halal Market Demand	0.099	0.104	0.118	0.842	0.400
Top Management → Business Performance	-0.046	-0.053	0.096	0.486	0.627
Top Management → Government Support	-0.149	-0.130	0.166	0.899	0.369

Top Management → Halal Market Demand	0.251	0.267	0.144	1.740	0.082
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4.10 Hypotheses Testing

Hypothesis testing is the process used to evaluate the strength of evidence from the sample and provides a framework for making determinations related to the population, such as it provides a method for understanding how reliably one can extrapolate observed findings in a sample under study to the larger population from which the sample was drawn. The researcher formulates a specific hypothesis, evaluates data from the sample, and uses these data to decide whether they support the specific hypothesis (Hair et. al., 2019). The p-value hypothesis test gives a measure of how much evidence is present to reject the null hypothesis. The smaller the p-value, the higher the evidence against the null hypothesis.

In other words, when the size of the path coefficient of one exogenous latent construct is higher than other exogenous latent constructs, its effect on the endogenous construct is larger which means that its relevant influence on the endogenous construct is higher than the others with less path coefficient value. In this way, the researcher can pay attention to the salient predictors of a specific endogenous construct and decides which predictors have the strongest effect on the endogenous latent constructs under consideration.

To start with, by referring to Table 4.11, the results show that hypothesis H₁ is supported, there technology exhibits a significant and positive relationship with values of ($p = 0.078$, CI significant). H₂ also supported shows the finding values of ($p = 0.010$, CI significant). In contrast, H₃ is not supported, top management insignificant with value ($p = 0.627$, CI insignificant). In addition, organizational readiness exhibits a significant positive effect with values of ($p = 0.042$, CI insignificant). H₄ is supported.

Knowledge management exhibits a significant and positive relationship with values of ($p = 0.052$, CI significant). Thus, hypothesis H₅ is supported empirically by the findings. Table 4.10 provides a summary of the hypotheses' findings.

Table 4.11
Summary of Hypotheses

Hypotheses	Relationship	Std Beta	Std Error	t-values	P-values	BCI LL	BCI UL	F ²	VIF	Findings
H ₁	Technology → Business Performance	0.157	0.089	1.764	0.078	0.010	0.328	0.020	2.882	Supported
H ₂	Innovation → Business Performance	0.211	0.082	2.567	0.010	0.056	0.373	0.042	2.510	Supported
H ₃	Top Management → Business Performance	-0.046	0.096	0.486	0.627	-0.231	0.140	0.002	3.177	Not Supported
H ₄	Organizational Readiness → Business Performance	0.171	0.084	2.035	0.042	0.002	0.328	0.022	3.154	Supported
H ₅	Knowledge Management → Business Performance	0.179	0.092	1.941	0.052	0.012	0.366	0.042	1.792	Supported

4.11 Mediator Effect Assessment

The mediator specifies how (or the mechanism by which) a given effect occurs (Baron & Kenny, 1986). Baron and Kenny (1986) described a mediator variable as:

“The generative mechanism through which the focal independent variable is able to influence the dependent variable of interest... (and) Mediation...is best done in the case of a strong relation between the predictor and criterion variable (pp. 1173-1178)”.

Moreover, Sekaran and Bougie (2016) defined mediating variables as one surface between the independent variables start operating to influence the dependent variable and the time their impact is felt on it. There is a time-based quality

or time dimension to the mediating variable. In other words, carrying a mediating variable into play facilitates the researcher to paradigm a process. The mediating variable overlays as a role to the independent variable(s) performing in any situation, and assists to conceptualize and describe the influence of the independent(s) on the dependent variable.

Mediator is also known as an intermediate variable, or explanatory link (Rose et al., 2004). Mediators are also considered to have mediating effects which are otherwise labeled indirect effects, surrogate effects, intermediate effects, and/or intervening effects (Wu & Zumbo, 2007).

Bootstrapping, a nonparametric resampling procedure, has been recognized as one of the more rigorous and powerful methods for testing the mediating effect (Hayes, 2009; Zhao et al., 2010). The application of bootstrapping for mediation analysis has recently been advocated by Hair et al. (2017) who noted that:

“when testing mediating effects, researchers should rather follow Preacher and Hayes (2004, 2008) and bootstrap the sampling distribution of the indirect effect, which works for simple and multiple mediator models”.

Based on the results in Table 4.12, it could be expressed that, H_{6a}: Technology affects the halal business performance mediated by the government support (significant with a p-value of 0.000).; H_{6b}: Innovation affects the halal business performance mediated by government support (significant with a p-value of 0.078).; H_{6c}: Top management affects the halal business performance but is not mediated by government support (insignificant with a p-value of 0.369);

Furthermore, H_{6d}: Organizational readiness affects the halal business performance but is not mediated by the government support (insignificant with a p-value of 0.934); H_{6e}: Knowledge management affects the halal business performance

mediated by the government support (significant with a p-value of 0.011); H7a: Technology affects the halal business performance but not mediated by the halal market demand (insignificant with a p-value of 0.400);

Hence, H7b: Innovation affects the halal business performance but is not mediated by the halal market demand (insignificant with a p-value of 0.376); H7c: Top management affects the halal business performance mediated by the halal market demand (significant with a p-value of 0.082); H7d: Organizational readiness affects the halal business performance but is not mediated by the halal market demand (insignificant with a p-value of 0.378); H7e: Knowledge management affects halal business performance mediated by halal market demand (significant with a p-value of 0.004).



Table 4.12
Hypotheses Testing for Mediating Effect

Hypotheses	Relationship	Std Beta	Std Error	t-values	P-values	BCI LL	BCI UL	F ²	VIF	Significance	Findings
H _{6a}	Technology → Government Support → Business Performance	0.573	0.137	4.188	0.000	0.287	0.818	0.206	2.388	Yes	Supported
H _{6b}	Innovation → Government Support → Business Performance	0.060	0.142	0.396	0.078	0.410	0.258	0.068	2.481	Yes	Supported
H _{6c}	Top Management → Government Support → Business Performance	-0.149	0.166	0.899	0.369	-0.415	0.226	0.011	3.019	No	Not Supported
H _{6d}	Organizational Readiness → Government Support → Business Performance	0.016	0.195	0.082	0.934	-0.389	0.375	0.000	3.132	No	Not Supported
H _{6e}	Knowledge Management → Government Support → Business Performance	0.227	0.089	2.551	0.011	0.053	0.398	0.048	1.613	Yes	Supported
H _{7a}	Technology → Halal Market Demand → Business Performance	0.099	0.118	0.842	0.400	-0.131	0.326	0.006	2.388	No	Not Supported
H _{7b}	Innovation → Halal Market Demand → Business Performance	0.113	0.127	0.885	0.376	-0.162	0.337	0.007	2.481	No	Not Supported
H _{7c}	Top Management → Halal Market Demand → Business Performance	0.251	0.144	1.740	0.082	0.002	0.558	0.030	3.019	Yes	Supported

H _{7d}	Organizational Readiness → Halal Market Demand → Business Performance	-0.116	0.131	0.882	0.378	-0.376	0.148	0.006	3.132	No	Not Supported
H _{7e}	Knowledge Management → Halal Market Demand → Business Performance	0.311	0.108	2.880	0.004	0.095	0.514	0.087	1.613	Yes	Supported



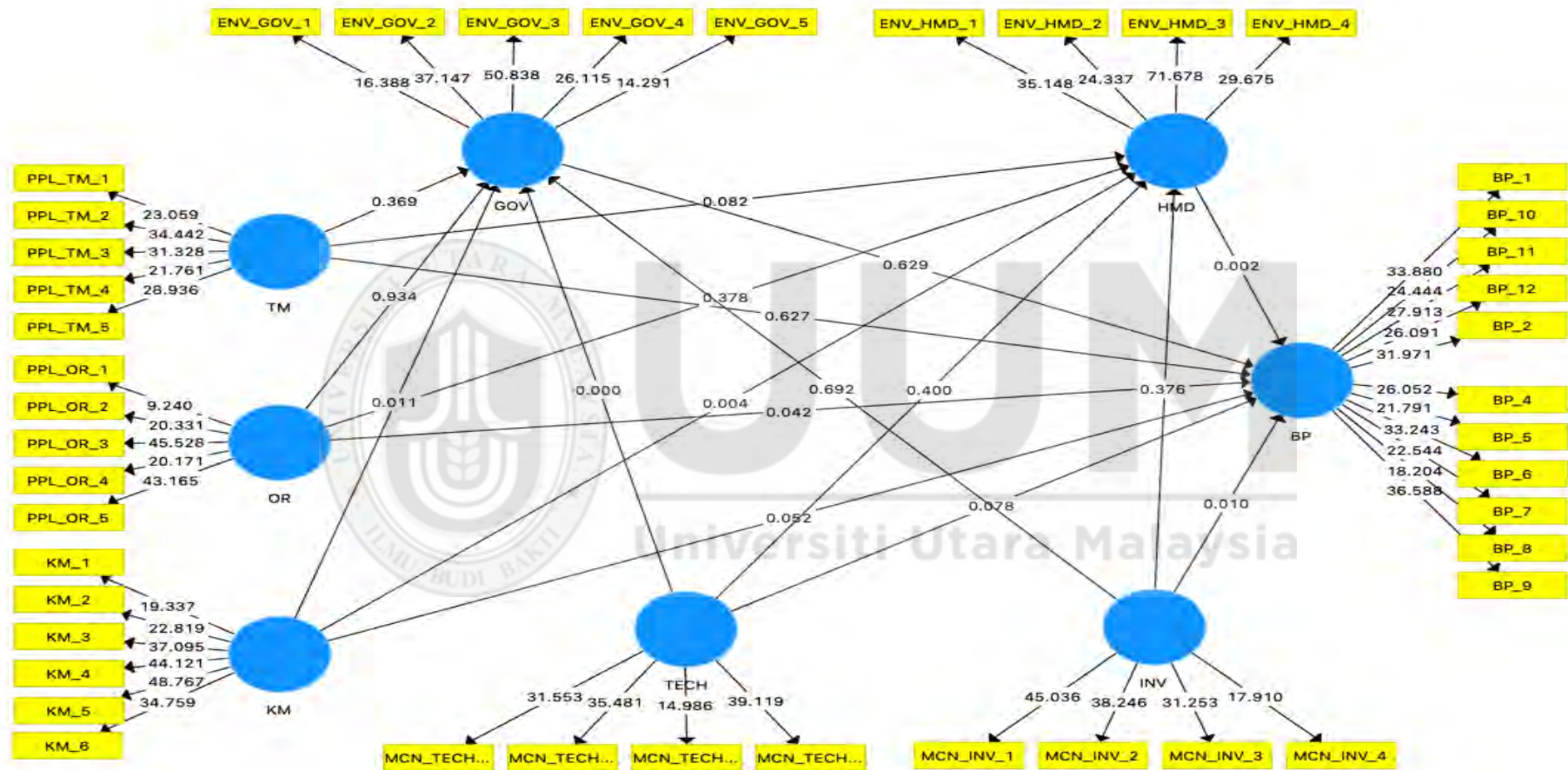


Figure 4.4 Bootstrapping (Mediating Relationships)

Figure 4.5

Bootstrapping (Mediating Effects)

4.12 PLS Predict

The predictive power of a model is a model's ability to generate accurate predictions of new interpretable observations, temporal or cross-sectional. Predictive validity indicates that a given set of measures of a particular construct can predict a given outcome variable. Predictive validity (out-of-sample prediction) was evaluated using cross-validation with holdout samples. Table 4.12 show that the indicator prediction summary for this reasearch. The root mean squared error (RMSE) and mean absolute error (MAE) values for the PLS model are lower than for the linear regression model (LM). In addition, the Q2 values for the indicators of the PLS model are larger than those generated for the LM model.

Table 4.12
PLS Predict

	Indicator Prediction Summary								
	PLS			LM			PLS-LM		
	RMSE	MAE	Q ²	RMSE	MAE	Q ²	RMSE	MAE	Q ²
BP_1	0.614	0.458	0.327	0.761	0.589	-0.034	-0.147	-0.131	0.361
BP_2	0.644	0.471	0.317	0.780	0.598	-0.003	-0.136	-0.128	0.320
BP_3	0.934	0.730	0.131	1.137	0.865	-0.290	-0.204	-0.134	0.421
BP_4	0.723	0.562	0.287	0.882	0.686	-0.062	-0.159	-0.123	0.349
BP_5	0.565	0.435	0.394	0.689	0.539	0.098	-0.124	-0.104	0.296
BP_6	0.639	0.465	0.307	0.737	0.567	0.076	-0.099	-0.102	0.231
BP_7	0.587	0.447	0.397	0.638	0.493	0.288	-0.051	-0.046	0.109
BP_8	0.489	0.381	0.435	0.572	0.450	0.226	-0.083	-0.069	0.209
BP_9	0.537	0.409	0.333	0.600	0.470	0.169	-0.062	-0.061	0.164
BP_10	0.522	0.404	0.392	0.589	0.456	0.228	-0.066	-0.052	0.164
BP_11	0.535	0.417	0.356	0.635	0.499	0.093	-0.100	-0.082	0.263
BP_12	0.487	0.379	0.421	0.581	0.428	0.177	-0.094	-0.049	0.245

4.14 Summary of Findings

Table 4.13
Summary of All Findings

Hypotheses	Relationship	P-values	Significant	Findings
H ₁	Technology → Business Performance	0.078	Yes	Supported
H ₂	Innovation → Business Performance	0.010	Yes	Supported
H ₃	Top Management → Business Performance	0.627	No	Not Supported
H ₄	Organizational Readiness → Business Performance	0.042	Yes	Supported
H ₅	Knowledge Management → Business Performance	0.052	Yes	Supported
H _{6a}	Technology → Government Support → Business Performance	0.000	Yes	Supported
H _{6b}	Innovation → Government Support → Business Performance	0.078	Yes	Supported
H _{6c}	Top Management → Government Support → Business Performance	0.369	No	Not Supported
H _{6d}	Organizational Readiness → Government Support → Business Performance	0.934	No	Not Supported
H _{6e}	Knowledge Management → Government Support → Business Performance	0.011	Yes	Supported
H _{7a}	Technology → Halal Market Demand → Business Performance	0.400	No	Not Supported
H _{7b}	Innovation → Halal Market Demand → Business Performance	0.376	No	Not Supported
H _{7c}	Top Management → Halal Market Demand → Business Performance	0.082	Yes	Supported
H _{7d}	Organizational Readiness → Halal Market Demand → Business Performance	0.378	No	Not Supported
H _{7e}	Knowledge Management → Halal Market Demand → Business Performance	0.004	Yes	Supported

4.15 Chapter Summary

This chapter has reported the findings of this study. It has also presented the response rate and the characteristics of the respondents. It also explained the techniques employed in measurement refinements. After that, among others about the analyses run to examine the instrument's validity and reliability tests. In general, the results showed significant effects of the machine, people, knowledge

management, and environment on halal business performance. Specifically, the effects of technology, innovation, top management, organizational readiness, and knowledge management. government support and halal market demand towards halal business performance. More importantly, this chapter has offered results of PLS-SEM analysis that was obtained from the evaluation of the measurement model, structural model, and hypotheses testing.



CHAPTER FIVE

DISCUSSIONS AND CONCLUSION

5.1 Introduction

This chapter provides a discussion of the findings that have been presented in the preceding chapter to support the developed hypotheses. The chapter presents the recapitulation of the key findings followed by a discussion of the study outcomes concerning the research questions and objectives. It proceeds with the examination and discussion of the results of the hypotheses tested in this study. Theoretical, methodological and practical implications of the study are also presented. Lastly, the chapter addresses the limitations of the study as well as provides some suggestions for future research.

5.2 Recapitulation of Study

This study examined the direct relationships between three (3) independent variables; machine (technology and innovation), people (top management and organizational readiness), and knowledge management (understanding, integrity, and awareness) towards the dependent variable which is halal business performance. SMEs halal food manufacturers are increasingly tasked with driving the economy globally.

Based on previous studies, halal food products have turned out to be progressively popular among consumers globally, as the idea of halal is related to good, healthy, safe, and high-quality assessment (Ahmed et al., 2020; Haleem et al., 2019). In other words, the halal food industry ought to strengthen the implementation of halal standards to ensure and certainly guarantee the halalness

of the foods sold (Fathi et al., 2016). Business development strategy is the creation of long-term value for SMEs towards consumers and markets related to the process of product preparation and analysis for potential growth opportunities. There are many opportunities that SMEs can use as a business strategy to improve their business performance as a competitive advantage in the halal industry. The market share is a key indicator of market competition because it shows how much the market is controlled by a company against its competitors.

In competitive markets, SMEs must also exhibit technological sophistication. SMEs must be innovative to overcome limited resources, vulnerability to unpredictability, volatility in business environments, and extensive customer and supplier power (Fernando et al., 2023; Patel et al., 2023). However, there is frequent uncertainty around potential future SME innovation activity when designing future innovation policy. Innovation is the implementation of a new or significantly improved product (good or service) or process, a new marketing method, or a new organizational method in business practices, workplace organization, or external relations' (Eurostat, 2018).

It is observed factors such as environmental uncertainty as important in determining SMEs' business performance. External conditions can be recognized by carefully observing the competition, regulation, inflation rate, economic cycle, customer demands and expectations, and other elements that might uncover opportunities and risks (Al-Ansi et al., 2019; Ali et al., 2017). Companies and SMEs must plan strategically. Company leaders must strive to strike a balance between a market's internal and external strengths, as well as be able to see internal and external conditions objectively. Strategic planning is essential for achieving a competitive advantage (Hatta et al., 2019).

In this study, government support and halal market demand were tested as a mediator between the independent variable and the dependent variable among SME food manufacturers. A mediator is an intervening variable that is considered to account for the relationship between the predictor variable and the outcome variable.

5.3 Discussions

This section discusses the findings on both the direct and indirect effects of the variables in the study. The discussion will be to answer the following research questions developed earlier in this study:

- 1) To what extent does the machine (technology and innovation) affect the halal business performance of SMEs?
- 2) In what way the effect exists between people (top management and organizational readiness) and the halal business performance of SMEs?
- 3) What is the effect of knowledge management (understanding, integrity, and awareness) on the halal business performance of SMEs?
- 4) Does the environment (government support and halal market demand) mediate the effect of machine, people, and knowledge management on the halal business performance of SMEs?

5.3.1 The Effect of Machine on Halal Business Performance

The first objective of this study is to examine whether machines influence halal business performance among SME food manufacturers

5.3.1.1 H₁: Technology on Business Performance

The related objective of this study is to examine the effect of technology on halal business performance. PLS-SEM was employed in the analysis, and the results revealed technology was positively related to halal business performance. It shows

that technology predicts halal business performance.

Technology impact SMEs' business performance in implementing HMS (i.e., equipment that aligns with the halal standard requirements, and new technology that increases output quality in manufacturing processes. Technology that improves production control, innovated the process to comply with the halal standard and innovated the tools to increase productivity.

It was found that technology has a positive effect on the halal performance of SMEs. For instance, digital technology will impact the organization's performance when implementing HMS. It will increase halal production and ensure that the company obtains a competitive advantage. The technology used in the halal production system adds value to SMEs. Many previous kinds of research proved that technology can enhance SMEs' business performance in the halal food industry (Hanifah et al., 2019; Novia et al., 2020). Studies from Azmi (2018) show that the practitioners believed the technology would help them influence their business, specifically on sales growth. Technology factors contribute to improved business performance. Therefore, H_1 is supported by the analysis whereby a technology factor has a positive significant effect on the business performance of halal manufacturers.

Even though blockchain technology for SMEs is still in its infancy, it is the optimal option for SMEs seeking to increase their competitiveness by enhancing their performance. There are SME participants in the halal supply chain that use blockchain technology from input to output. The technology utilized by SMEs is crucial for enhancing the HMS-compliant production performance of halal products. In the halal production of products by SMEs, light technology is implemented, for instance, in packaging. Investment in new machinery and equipment represents technological change (Al-Ansi et al., 2019; Ali et al., 2017). Hence, innovation in

SMEs is critical for systems interactions that meet the desirable outputs. Haewoon (2016) found a direct positive relationship between IT and five firm performance variables (firm growth, market competitiveness, customer relationships, partnerships with providers, and operational efficiency).

Findings from Kheng and Muthuveloo (2019), supported that SMEs should further capitalize on ICT to modernize and improve their business performance. Hence, IT knowledge is one of the crucial skills for the SMEs' workforce as their organization has now adopted IT, realigned to the new technology, and acknowledged the importance of ICT. Similarly, Lo et al., (2016) found that technology orientation is significantly and positively related to both financial and non-financial performance.

The findings also concurred with past studies such as Sahin and Topal (2018), which examined and found a positive relationship between IT and business performance. The role of technology was highlighted in the past; for example, integrated information systems can lead to the improved business performance of companies in a supply chain. There are even SMEs that use technology or difficult working conditions to produce a variety of halal goods for export. There are a variety of technologies utilized by SMEs. This technology is utilized by carrying out the various duties involved. For instance, German machine technology for agricultural products and factory processing of halal and clean poultry. For difficult tasks, such as those requiring a specific level of heat or temperature, intelligent technology can be utilized. It is evidenced that technology-oriented firms have a better chance of achieving superior performance.

5.3.1.2 H2: Innovation on Business Performance

Innovations are generally done to meet such marketing goals as improvement in product quality, increase in sales, increase in market share, improved product design, and creation of new markets or market expansions. To achieve the objective of this study regarding the effect of innovation on halal business performance among SMEs food manufacturers, the results revealed that the proposed relationship was significant and, hence, the study hypothesis was supported.

Traditional halal supply chain management for SMEs necessitates innovation, according to the findings. This innovation allows SMEs to accomplish system and component traceability and dependability at the lowest possible cost. Without SME innovation, monitoring and tracking the entire HMS requires significant management effort. Many works of literature support the relationship between innovation and halal business performance among SME food manufacturers. Saunila (2017, 2019) stated innovation capability, conceptualized either as a process or as an outcome, affects the firm performance. Aligned with the majority of the studies found a positive relationship between innovation capability and firm performance in the context of small businesses (e.g., Oura et al., 2016; Zhang & Hartley, 2018).

SMEs innovate, for instance, by procuring halal ingredients and ensuring that they remain halal throughout the production process and in the workplace until they reach the consumers. Innovations requiring heavy labor, such as lugging containers of frozen halal food in certain SME processing factories. Consequently, SMEs must innovate in every process, beginning with the entire supply chain. Innovation is also related to the factory's restricted manufacturing space, where the freezer room is used to store products such as chickens for slaughter in a room with only one or two employees. Henceforth the evidence linked with the findings that innovation is

connected to new product performance (Zhang & Hartley, 2018), brand performance (Odoom & Mensah, 2018), and overall firm performance (Bhuiyan et al., 2016b; Dadfar et al., 2013; Salindal, 2019). Dadfar et al. (2013) concluded that the preconditions for this relation are for example effective organizational structure, learning, processes, and relationships with the suppliers, customers, and other networks.

In addition to process innovation, employees employed basic or compact technology for certain tasks. Even innovation for supply chain governance performance and a centralized HAS system for halal compliance and halal monitoring, including enhancing or taking action if there are variations in halal production, can be implemented. Therefore, innovation is a valuable strategy for exporting firms to gain competitiveness and achieve excellent business performance.

5.3.2 The Effect of People on Halal Business Performance

The study's second objective aimed to assess whether people can predict halal business performance among SME food manufacturers.

5.3.2.1 H₃: Top Management on Business Performance

The study examined the effect of top management on halal business performance. The result revealed that the proposed relationship between top management and halal business performance was not significant and, hence, the study hypothesis was not supported. This indicated that the top management did not have a significant impact on the business performance of SME food manufacturers in Malaysia. This result is consistent with Giang et al. (2016) and Schmitt et al. (2018) who found that there was no effect of administering on performance.

Previous studies have also found that top management and organization do not have a positive relationship with business performance (Nielsen & Nielsen, 2013). The commitment of top management does not affect company performance because it is evident at every level of the organization should have given the obligation to achieve higher business performance.

In addition to the commitment of the management, the entire organization involved in halal and assuring compliance with standards must also be committed. In the halal supply chain, it is evident that system interaction for an SME requires individuals who collaboratively work together. All parties should ensure that an organization's output of *Halalan Toyyiban* is of the highest quality. In addition to appointing a halal executive, SME will establish an internal halal committee to assure HAS compliance and periodically improve halal quality. The parties responsible for the administration of the halal manufacturing company must be committed to ensuring that the clauses are adhered to and that HACCP is handled properly.

Additionally, SMEs should follow appropriately the HAS system to be practiced in the entire organization system. Hence, it demonstrates that all parties, not just the top management, are committed to HAS. Pioneer researchers such as Nielsen (2013) concluded that top management's impact on firm performance is still not clearly explained in the literature for the past centuries. Azmi et al. (2019) also found that top management support has no significance on business performance.

The finding of the study is also supported by the results of Silalahi et al. (2021), which affirm the commitment required from all parties, particularly those who implement the operation of the halal system. Even Susanty et al. (2021) argued that management frequently lacks commitment to halal functions, such as logistics functions. An organization that wishes to attain Shariah compliance must

demonstrate a commitment to best practices. To compete globally, SMEs with employees from diverse backgrounds and qualifications must ensure that employees at all levels are committed to achieving halal standards, that halal practices are implemented as an organizational culture, that they achieve high halal performance, and that they are committed to the halal system.

5.3.2.2 H4: Organizational Readiness on Business Performance

The related objective was to investigate the effect of organizational readiness on the business performance of SME food manufacturers in Malaysia. A hypothesis was tested to meet this research objective. The result revealed that the proposed organizational readiness and halal business performance were positively related, and, hence, the study hypothesis was supported. This indicated that the level of organizational readiness has a positive impact on the halal business performance of SME food manufacturers in Malaysia.

Organizational readiness improves the halal business performance of SMEs by ensuring that the company is adequately prepared to manage its systems. It began when the SME realized the advantages of implementing halal systems. In addition to the competitive pressure to promote halal with established systems, organizational readiness is also necessary. SME concentrate on the entire halal supply chain, from raw material sources to the delivery of products to consumers.

The readiness of SMEs could be determined by the interactions of the system on the awareness and comprehension of the entire system, such as HAS, HACCP, and factory and quality management systems for food production. Henceforward, the present finding seems to be consistent with Azmi et al. (2019) with the results indicating that organizational readiness and expected business benefits played

important roles in influencing business performance. Organizations prepare and plan to adopt and enhance halal standards. As a component of business performance, SMEs must investigate HAS's flaws to guarantee consumer satisfaction. It is understood that organizational readiness facilitates the implementation of HAS, which could increase the efficacy and efficiency of halal production. Despite that, this is true as Ngah et al. (2019) defined organizational readiness as the capability of the organization to adopt HMS, both top management and employees who understand the operations for halal standards.

Organizational readiness as it pertains to halal operations and production, across all certified divisions employing halal systems. Maintaining halal food certification necessitates organizational readiness, which has resulted in cost reduction and enhanced accounting systems. The organization's preparedness could reduce risks, save time, cut down on waste, and safeguard resources in the halal supply chain to improve business performance. Consistent with previous studies (e.g., Dewantara et al., 2018; Giyanti et al., 2020a), they have also found that organizational readiness and have a positive relationship with business performance.

5.3.3 H₅: Knowledge Management on Business Performance

The third objective of the study aimed to assess whether knowledge management (understanding, awareness, and integrity) can predict halal business performance among SME food manufacturers. The result revealed that the effect between knowledge management and halal business performance was not significant, and, hence, the study hypothesis was not supported. This indicated that knowledge management (understanding, awareness, and integrity) did not have a significant impact on the business performance of SME food manufacturers in Malaysia.

This is an intriguing discovery because the SME will be required to comply with all HMS clauses. Consequently, knowledge management had no impact on the efficacy of halal businesses. Therefore, it is the employee's responsibility to ensure that HACCP-compliant quality standards are maintained. In addition, according to HAS 23000, SMEs are required to conduct hands-on, in-house halal training at least once a year. Supian and Abdullah (2019) have demonstrated that staff training and business experience are the factors that contribute to the phenomenon that prevents knowledge management from affecting profit. In addition to the significant flaws of the current state, we can refer to the lack of knowledge management activities in small and medium-sized enterprises. SMEs can improve the success of the halal standard practice, which is advantageous to the performance of businesses.

Numerous tasks rely on manually rewriting data from and to the HMS database. SME procedures for assuring food compliance with Syariah. SMEs with a halal certification should not compromise the halal integrity of their products. This result is corroborated by the findings of a recent study (Othman et al., 2017) on the halal standard practice of SMEs through tenure and training on specific tasks as required by HAS. Consequently, halal executives, consultants, and auditors can incorporate their knowledge into the process of adopting halal standard practices, which improves business performance. This could be seen on an individual basis. These include online information-sharing programs for SMEs. To effectively manage knowledge, SMEs must devise novel strategies for maximizing the utilization of their available resources. It would appear that the manager of quality assurance was referring to the tenets of halal as well as the organization's current procedures and standards.

Understanding HMS has no direct effect on the operation of the business. In other words, halal awareness has no direct effect on the efficacy of the company. This is because, in SMEs, they are some managers who mainly focus on productions, and sales. Their main concerns are more on the reduction of production and operation costs rather than sharing the knowledge. In addition, SME efforts must be concentrated on assuring compliance with all clauses and involving all stakeholders. Consequently, the Systems Theory's emphasis on the interconnections between systems contributes to the efficient maintenance of standards. The proprietor of an SME, on the other hand, must have prior business experience to be successful. This result is consistent with Azmi et al. (2019) who found that understanding the practices, awareness, and integrity has no significance on business performance. The study explained the application of halal principles across the board in the manufacturing process is a must and should be implemented by the company which mostly are run by Bumiputera owners. Besides, the Shariah rules in the halal supply chain might guarantee the integrity of the food production process while also satisfying religious requirements. Since it is mandatory, halal food manufacturers should encourage this practice because it is central to the concept of halal, which indirectly did not determine the business performance. The findings were also due to the limitations of their study on a relatively small sample size of Bumiputera's own manufacturers.

5.3.4 Mediating Effect of Environment (Government Support and Halal Market Demand) on Machine, People, Knowledge Management, and Business Performance

The fourth objective of this study regarded the effect of the environment on the machine,

people, and knowledge management on the halal business performance of manufacturing SMEs in Malaysia.

The result revealed that the mediating effect of government support and halal market demand on machine, people, and knowledge management on halal business performance revealed both significant and insignificant results.

5.3.4.1 H_{6a}: Technology on Business Performance Mediated by Government Support

It was proved that, technology affects the halal business performance mediated by government support. Government assistance mediates the relationship between technology and SME halal business performance. This is because the technology could enhance halal production. It ensures the effectiveness of the SME sector. The findings are supported by previous studies on SMEs that highlighted the significance of technology and how it could be attained with government assistance (Negi, 2020). Government support mediated how the technology could work efficiently to attain high performance in business. It is considered as a requirement towards a modernized industrial systems, which is also consistent with the findings of Hendayani and Febrianta (2020). This includes the halal supply chain, which consists of multiple stakeholders, supplies, and customers that can improve the business's performance. According to numerous previous studies, the government should provide more exemptions to SMEs that implement and adopt technological systems for the halal market nationally and globally. For example, using advanced automation (Paik et al., 2017), AI, RFID, and similar technologies could extend the expiration life of halal foods.

5.3.4.1 H_{6b}: Innovation on Business Performance Mediated by Government Support

Innovation affects the halal business performance mediated by government support. Aside from that, government support plays a significant role in innovation in the manufacturing process, such as the use of appropriate labeling to improve production efficiency. SMEs can reap the benefits of innovation because the government provides them with numerous awards, rewards, and incentives. The focus was on the innovation in HMS and manufacturing systems, and likewise Hartanto et al. (2017) agreed on how the machine could be operated to ensure *Halalan Toyyiban*, avoid contamination, and ensure halal integrity, among other things. The study also found that government intervention is essential and encourages policy-level adjustments to provide support for SMEs to enhance organizational performance (Negi, 2020).

External environment factors are important because they can cause direct and indirect effects on business operations, personnel, and revenue. Guo et al. (2017) found that environmental factors significantly affect enterprise growth. These findings contribute to the notion in the literature that each government agency involved should carry out its vital role to develop well further and sustain the Malaysian halal food industry (Adha et al., 2017). Research from Azmi et al., (2019) revealed that government support is a factor that influences SMEs' business performance in the halal industry.

5.3.4.2 H_{6c}: Top Management on Business Performance Mediated by Government Support

On the other hand, government support did not mediate the effect of top management on halal business performance. In terms of the increase in halal business performance,

the government's support did not affect the upper management. This is due to the nature of government support, which demanded that every SME concentrate on technology and innovation while producing halal products. Although Bendickson et al. (2016) stressed that reducing environmental and government support led to higher levels of company performance, Liu (2017) reveals a lack of evidence on the connection between government support and performance. However, the government mostly supports the businesses during the retail phase and less on production, which could not determine the effect on halal business performance.

Top management endorses halal systems unaffected by government funding because top management has a direct impact on business performance, such as assuring the company's efficacy and efficiency. Previous studies have also found that government support does not have a positive relationship with business performance (Hendro, 2019; Hoai et al., 2018). To comply with HAS, top management will need skilled employees, such as on operational performance. In addition, prospective reasons involve the networking of top management with all stakeholders in the halal supply chain.

5.3.4.3 H_{6d}: Organizational Readiness on Business Performance Mediated by Government Support

In addition to the discussions in this section, government support did not mediate the effect of organizational readiness on halal business performance. Government assistance did not moderate the relationship between organizational preparedness and halal business performance. In this context, organizational readiness focuses on internal performance by adhering to HAS and gaining HACCP control.

In addition to government support, other factors, such as the efficacy of the halal supply chain, may contribute to a higher level of halal business performance. According to their suitability for adoption, the technology discussed by Hendayani and Febrianta (2020) could enhance the performance of SME halal businesses. Organizational readiness concerning HMS documentation for organization-wide practice. The effect of government support on organizational readiness for business performance enhancement is refuted because numerous organizational systems components must be in place for an organization to be prepared to enhance its performance. This result is consistent with Azmi et al. (2019) who found that government support has no significance on business performance ($p\text{-value} = 0.077$). Utilization of ICT and technology in manufacturing and production processes, as well as compliance assurance, in addition to many other divisional functions such as quality assurance, production, packaging, etc.

5.3.4.6 H_{6c}: Technology on Business Performance Mediated by Government

Support Knowledge management affects the halal business performance mediated by government support. The results of the halal supply chain have improved as a result of government support for information sharing among vendors (Nusran et al., 2018), such as through the right form of policy. The government managed numerous events and summits to bring together all halal SME manufacturers, key players, and investors to conduct business marketing and matching and share about the latest technology usage. Other than that, the potential of exports, data, and technology exchange is done, and to enhance business performance. Despite that, government regulation significantly affects the food firms implementing halal food standards (Rahman et al., 2018). Also, Adha (2017) posted that SMEs that applied knowledge

management to their organization like understanding, awareness and integrity can influence their business performance. Knowledge plays a role in determining strategies to achieve the goals and directing the organization member to the achievement of the plan along with its knowledge management creating a halal traceability system that may inevitably help halal-based industry players.

5.3.4.7 H_{7a}: Technology on Business Performance Mediated by Halal Market Demand

It was proven that, halal market demand did not mediate the effect of technology on halal business performance. Halal market demand did not predict the impact of technology on the performance of halal businesses. In this sense, the halal market demand did not mediate the relationship, as technology is a significant factor in halal business performance. The activities are facilitated by technology to conform to halal standards, increase production, and reduce costs. This is supported by prior research (e.g. Ali et al., 2022) indicating that the halal market demand is essential for business, but that it was not connected to mediate the technology and the outcome variable, i.e. the halal business performance, are significant variables.

5.3.5.1 H_{7b}: Innovation on Business Performance Mediated by Halal Market Demand

Besides, halal market demand did not mediate the effect of innovation on halal business performance. Innovation could have a direct impact on business performance, independent of the halal market demand. This is because innovation is one of the most essential factors in business performance. Another possible explanation is that SMEs aspire for innovation in production, packaging, research and development, and logistical performance, among other areas. Some studies are

also monitored in innovation such as R&D (Nawawi et al., 2019), which is a specialized area that cannot be compromised in SME food production. This finding indicates that innovation could increase halal production and the efficacy of the halal supply chain. Consequently, intelligent production influences the effectiveness of a business.

5.3.5.1 H_{7c}: Top Management on Business Performance Mediated by Halal Market Demand

Top management affects the halal business performance mediated by halal market demand. When halal market demand exerts pressure on a business, the upper management must make decisions regarding numerous factors, such as strategy, technology adoption, talent management, etc. This is consistent with previous research indicating that market demand will increase the upper management's sensitivity to competitive business pressures. Therefore, the upper management will investigate mitigating issues in the upstream and downstream of the halal supply chain. Concentrating on the halal market demand would increase their focus and activity to enhance business performance.

5.3.5.1 H_{7d}: Organizational Readiness on Business Performance Mediated by Halal Market Demand

On top of that, halal market demand did not mediate the effect of organizational readiness on halal business performance. This is because the readiness of the SME halal food manufacturer includes other factors, such as technology and innovation, for example in procurement, production, processing, warehouse, and distribution. Based on previous research, it is evident that readiness for change, which is not solely

driven by halal market demand can give SMEs a competitive edge, but also a policy and system dynamic (Nusran et al., 2018).

Halalan Toyyiban, halal product quality assurance, and halal production necessitate that organizations have short-term, intermediate-term, and long-term investment plans for areas requiring improvement. For instance, innovation readiness, well-equipped personnel, operational scope, and production flexibility. The plan calls for improved knowledge exchange, strategic partnerships, and stakeholder collaborations in HMS. Consequently, SMEs could experience volume growth, cost control, vertical coordination, continuous supply, effective inventory management, and technological application.

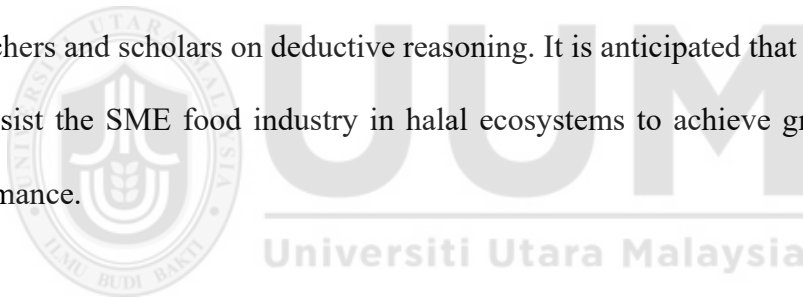
5.3.5.1 H_{7c}: Knowledge Management on Business Performance Mediated by Halal Market Demand

As well, halal market demand did not mediate the effect of knowledge management on halal business performance. Without relying on halal market demand, halal business performance can be improved by producing halal-compliant goods of superior quality. It could also enhance the business by reducing operational and inventory costs. Knowledge management could be based on customer requirements and the greatest level of business improvement. A previous study by Azmi et al. (2019) found that halal market demand played an important role in influencing business performance the result the significant variable that explained business performance is halal market demand ($\beta=0.542$, $p=0.000$). Despite that, Talib et al. (2016) findings showed that consumer pressure or halal market demand significantly affects the food firms implementing halal food standards.

5.4 Implications of the Study

Scholars, academics, researchers, governments, and practitioners in strategic management, distinctive capabilities, and environmental uncertainty have given more interest in SMEs' performance. The research framework was based on the theoretical gaps, Systems Theory (Bertalanffy, 1984), and prior evidence identified in the literature is hoped to contribute to the body of knowledge, methodological clarification, and practical implications.

The novelty of this research is specifically in terms of the body of knowledge, the ontology of strategic management, and the performance of SME fields, in the food manufacturers' context. Therefore, the results could be used by practitioners, policymakers, and stakeholders for application and policy making, and also researchers and scholars on deductive reasoning. It is anticipated that the knowledge will assist the SME food industry in halal ecosystems to achieve greater business performance.



5.5 Theoretical Implications

This study contributes significantly to Systems Theory as an underpinning theory of the research framework. The study provided a unique opportunity for expanding systems theory to explore and determine the interaction within key systems theory variables. In this study, Systems Theory has been adopted, but a new framework has been created based on this Systems Theory to improve halal business performance among SME halal food producers.

The findings of this study are consistent with and support the Systems Theory of strategic management. Systems theory is a theoretical framework for understanding how organizations work. A system can be defined in different ways,

but it is best characterized as an entity that has all the elements necessary to carry out its functions. It started as a way to understand organizations from an outside perspective but has since become a means of gaining insight into daily operations within an organization (Alter, 2013).

Alter (2010) proved that the Systems Theory of management asserts that any organization is a single, unified system of interrelated parts or subsystems. Each part of the overall system is dependent on the others and cannot function optimally without them. Therefore, if factors are present that adversely affect one subsystem within an organization, it is likely these factors may adversely affect other subsystems, too. This can result in impacts on the entire system to a certain extent. This framework presents an organization as a natural ecosystem, where each element is interdependent. Various components of a system also interact with each other regularly, which is true in a modern organization like a business, although this can happen in different ways.

This study's findings provide a clear space for advancing our understanding of how systems interact with one another to enhance the performance of SMEs that offer halal food products. This is because until now, it has been an unexplored latent construct in the unique context of SMEs. This study demonstrates the essential system components as discussed previously in each sub-sections which are technology, innovation, organizational readiness, knowledge management, and environment for SME halal business performance. To be more particular, the technology, innovation, organizational readiness, and knowledge management have had effect on the performance of the firm. In addition, the important results demonstrated that the government support mediates the relationship between technology and business performance; innovation and business performance; and

knowledge management and business performance. When it comes to the mediating effects of halal market demand, the significant results were top management and business performance; and knowledge management and business performance.

The findings implied the basic concept of Systems Theory from Bertalanffy helps frame the complexity of halal food for business performance. One of the facilities for food managers would implement from this concept is, processing or manufacturing includes all the steps along the continuum that prepare the food for distribution. The concept of point of final service includes any points where foods are purchased and/or consumed, such as grocery stores, restaurants, delis, or the home. This food system concept is influenced by internal and external system variables such as machines, people, processes, and the environment.

The implementation of variables in Systems Theory, which are machine (technology, and innovation), people (organizational readiness), knowledge management and environment proved that the factors of internal and external organizations can impact business performance. Ali et al. (2022) and Haffer (2017) state in their research that it is important to understand the internal and external measures because these variables exert such strong influences on every aspect of the halal food system, from inputs through outcomes (from farm to table). Specifically, the internal variables can pull the business performance toward the halal food industry. Understanding these variables, especially their interactions with each other, is key to understanding how this system operates and why it operates the way it does.

5.6 Methodological Implications

This research has also contributed from a methodological standpoint. Utilizing a positivist and deductive approach, the survey questionnaire serves as the primary

source of data. The results were supplemented by the distribution of a comprehensive questionnaire, which was completed by the SME's representative. After that, an explanation of the quantitative analysis was provided. It offers the knowledge on the nature of the research query, that is being investigated by a causal-effect methodology.

In scientific methods, the research established a normative measurement for PLS-SEM. In addition, this investigation has provided evidence of the interactions between systems and a mediator. Interestingly, the hypotheses predicted the SME halal business performance in a unique manner for each construct. The application of PLS-SEM is supported by methodological literature (Cheah et al., 2018; Ringle et al., 2018). The research demonstrates the originality of PLS-SEM in the field of study. In addition, the results for the hypotheses supported by Sarstedt and Cheah (2019) were revealed by the robust software application SmartPLS. Methodological distinctions between factor-based and composite-based structural equation modeling have been identified.

Thus, the contribution of PLS-SEM enables sophisticated predictive analytics as the optimal technique. In addition, this study demonstrates that the reduction in scale makes it possible to include other constructs in large studies with multiple-item scales, thereby influencing the performance of SME halal businesses with other variables. Future research might investigate the inductive method, which employs participant observation and interviews.

5.7 Practical Implications

This study contributed in several ways to the SME food manufacturers' business performance relationship. In terms of the application, the findings of the critical

factors for business performance for halal SMEs are technology, innovation, organizational readiness, knowledge management, and environment. For instance, the findings on the technology provide good information for SME food manufacturers to face the problem and improve their business performance. SMEs in the halal food manufacturing industry have an optimal understanding of the factors that will affect their business performance. This is to ensure that their business continues to grow and ultimately helps to support the development of the economy in Malaysia. Besides that, the competitiveness of SMEs will be increased through the implementation of new technology and innovation. The results of the study revealed that technology affects halal business performance, in line with Azmi et al. (2019), therefore, SMEs should adopt technology in the production process. The adoption of new technology (equipment) that aligned with halal standard requirements could:

- i. assist SMEs in producing more output
- ii. improve and increased the production control
- iii. reduce the production costs
- iv. increase output quality in manufacturing processes

In addition, as innovation affects halal business performance SMEs should align halal standards in the manufacturing systems. In addition to that, the top management could play significant roles in overseeing the business operation and adherence to the set of standards and procedures for the benefit of its stakeholders (Ramli, 2020). Being the top management team responsible for giving direction to the company, and responsible maintaining the halal certification and compliance to HAS. Specialized halal training for gaining new skills in HMS should be provided. Investment in better equipment and well-prepared to be more competitive in the halal industry market.

This study's findings could contribute to the SMEs' halal food manufacturers as well as the government by assisting them in HAS. Specifically, the government as policymakers should help in terms of, for instance:

- i. Framework and policy for financial assistance
- ii. Sufficient infrastructures for halal factory ecosystems
- iii. Big Data on halal expansion opportunities

5.8 Limitations and Future Research

This study has several limitations. First is that in this study factors affecting either directly or indirectly SMEs halal business performance were limited to people (top management and organizational readiness), which many other constructs for people could be developed based on other theories. The findings on top management and organizational readiness indicated a low level of R-squared. Future research may widen the scope of the study by incorporating other variables such as middle-level management and lower-level management. This is due to the reason that SMEs' halal business performance has a unique context. The measurement scales with different underpin theories require further examination.

This study adopted a quantitative survey method, and a questionnaire was the only instrument used to collect the data. The limitation of this method is that it cannot guarantee the reliability of the data collected because it depends on the respondent's attention to detail when answering the questions. In addition, the information gathered about the study variables is limited to the questionnaire responses. Perhaps future research should also employ qualitative methods as a triangulation strategy, including detailed interviews to elicit verbal descriptions of

characteristics (Wright & Grant, 2010). Qualitative research usually involves fewer cases investigated in more depth than quantitative research. It would also provide a more comprehensive understanding of the business performance of SMEs as a player in the halal food industry.

A cross-sectional sample was employed to obtain the data and was also restricted by the MCO. The data collected were based on the perceptions of respondents in terms of their responses to the questionnaires used at a particular time. This does not allow the determination of cause and effect or the impact of changes over time (Creswell, 2013; Zikmund et al., 2010). It would be of greater value for a longitudinal study to be conducted that collects data over two or more points of time to get the causal relationships of all variables in future studies. Obtaining and studying data using the longitudinal method would likely provide further insights regarding probable outcomes, and thus gives a clearer picture of the relationship between the variables and halal business performance.

The study also relied mainly on the self-reports of the respondents. While self-report data are a practical and feasible method of data collection, they may not be precise reflections of reality. Self-reported data tend to be more positive and may not always be truthful (Creswell, 2013; Zikmund et al., 2010). Future research could benefit from using more objective measures or a combination of perceptual and accurate data to provide reliable conclusions on the performance construct.

Future research may involve additional stakeholders, suppliers, and the proximal and downstream halal ecosystems. It can also include government, regulatory, and business-to-business customers. This research was conducted exclusively in Malaysia, but the deductive method based on Systems Theory could

be replicated in other developing nations. Future research could employ an inductive strategy concerning other halal industries. It should investigate the factors that impact the context of large-scale halal food manufacturers. This study provides suggestions for a future research agenda that will assess sustainability performance in greater depth.

5.9 Conclusions

This study investigated SMEs' halal business performance measured by three (3) variables, namely machine (technology and innovation), people (top management and organizational readiness), and knowledge management (understanding of HMS, Halal awareness, and Halal integrity). The study also examined the mediator role i.e. environment (government support and Halal market demand) on the effect of machine, people, and knowledge management, on halal business performance. Data were collected from 139 respondents who represented SMEs halal food manufacturers throughout Malaysia, and PLS-SEM was used in the final analysis. The research framework was underpinned by Systems Theory. The results revealed that machine (technology and innovation), and knowledge management (understanding, awareness, and integrity) positively and significantly affect halal business performance but people (top management and organizational readiness) were not significantly related to halal business performance. Further analysis indicated that the environment (government support and halal market demand) mediates the relationship between machine, people, and the environment on halal business performance. In specific the significant results technology, innovation, organizational readiness, and knowledge management on the business performance. Furthermore, the significant results showed on technology and business performance

mediates by the government support; innovation and business performance mediates by the government support; and knowledge management and business performance mediates by the government support. In terms of the halal market demand mediating effects that showed significant results were top management and business performance; and knowledge management and business performance.

This study has contributed to an increased understanding of the nature of knowledge management among SME halal food manufacturers especially company owners to increase their business performance in the halal food industry. It also provided a foundation through the identification of factors that positively and significantly affect directly and indirectly Halal business performance among SMEs. This central finding has theoretical, methodological, and practical implications on the importance of certain variables on SME halal business performance.



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APPENDICES

Appendix A Questionnaire



THE INFLUENCE OF SYSTEM INTERACTION ON HALAL BUSINESS PERFORMANCE IN SMALL-MEDIUM ENTERPRISE FOOD MANUFACTURERS

Dear Valued Respondent,

I would like to seek your kind assistance to fill up the questionnaire on my research area on Small-Medium Enterprise (SME). It would take approximately ten (10) minutes to be completed. I would like to assure you that the information given will be treated as strictly confidential.

The questionnaire is divided into five (5) sections. Please fill up all the questions at your earliest convenience. For further assistance, please do not hesitate to e-mail me at nainazuha@gmail.com.

Thank you very much for your time.

Saya memohon kerjasama anda untuk mengisi soal-selidik dalam bidang penyelidikan saya berkaitan Perusahaan Kecil-Sederhana (PKS). Ia akan mengambil masa 10 minit untuk disiapkan. Saya ingin memberi jaminan bahawa maklumat yang diberikan akan dipastikan kerahsiaan.

Soal selidik terbahagi kepada lima (5) bahagian. Sila isi semua soalan secepat mungkin. Sekiranya memerlukan bantuan, boleh e-mel kepada saya di nainazuha@gmail.com.

Best regards,

Nainatul Farzuha Nor

PhD. Candidate

0195111971/nainazuha@gmail.com

INSTRUCTION/ ARAHAN

You are required to tick (✓) or highlight the appropriate response
Sila tanda (✓) pada jawapan anda atau berikan jawapan yang bersesuaian.

Section A : Respondent's and Company's Profile *Bahagian A: Latar belakang responden dan syarikat*

Respondent's Profile: *Latarbelakang Responden*

1. Your Age/Year:

Umur Anda (tahun):

☐

18-30

☐

31-40

☐

41-50

☐

>50 and above
> 50 dan keatas

2. Gender:

Jantina:

☐

Male

Lelaki

☐

Female

Perempuan

3. Education Level:

Tahap Pendidikan:

☐

SPM

SPM

☐

Diploma

Diploma

☐

Bachelor Degree

Ijazah Sarjana Muda

☐

Master Degree

Ijazah Sarjana

☐

PhD

Ijazah Kedoktoran

☐

Others (Please specify):

Lain-Lain (Sila nyatakan): _____

4. Current Post:

Jawatan Sekarang:

☐

CEO/ Managing Director

Ketua Pegawai Eksekutif/ Pengarah Urusan

☐

Owner

Pemilik

☐

Senior Manager/Manager

Pengurus Kanan/Pengurus

☐

Others (Please specify):

Lain-Lain (Sila nyatakan): _____

5. Department:

Jabatan:

☐ Management <i>Pengurusan</i>	☐ Financial <i>Kewangan</i>
☐ Marketing <i>Pemasaran</i>	☐ Logistic/Transportation <i>Logistik & Pengangkutan</i>
☐ Technology & Innovation <i>Teknologi & Inovasi</i>	☐ Cluster & Research Development <i>Pembangunan Kluster & Penyelidikan</i>
☐ Strategy & Corporate Development <i>Pembangunan Korporat & Strategi</i>	☐ Production <i>Pengeluaran</i>
☐ Others (Please specify): <i>Lain-Lain (Sila nyatakan):</i> _____	

6. Tenure with this company:

Tempoh perkhidmatan bersama syarikat sekarang:

☐ Less than 2 years <i>Kurang dari 2 tahun</i>	☐ 2-5 years <i>2-5 tahun</i>
☐ 6-10 years <i>6-10 tahun</i>	☐ More than 10 years <i>Melebihi 10 tahun</i>

Company's Profile:

Latar Belakang Syarikat:

1. Company's name:

Nama Syarikat: _____

2. Company's sector:

Sektor Syarikat:

☐ Dairy products <i>Produk tenusu</i>
☐ Grain mill products <i>Produk bijirin</i>
☐ Animals based products <i>Produk berasaskan haiwan</i>
☐ Vegetables and fruits <i>Sayur-sayuran & Buah-buahan</i>
☐ Bakery products <i>Produk bakeri</i>
☐ Chocolate and sugar confectionery products <i>Produk berasaskan coklat & gula (manisan)</i>

☐ Noodles products
Produk mi

☐ Others (Please specify) :
Lain-Lain (Sila nyatakan): _____

3. Certification/ recognition that company currently possessed:

Sijil / pengiktirafan yang dimiliki syarikat pada masa ini

☐ Halal Assurance System
Sistem Jaminan Halal

☐ Hazard Analysis Critical Control
Point (HACCP)
Analisis Bahaya Kawalan Titik Kritikal

☐ Good Manufacturing Practices (GMP)
Amalan Pengilang yang Baik

☐ Good Hygienic Practices (GHP)
Amalan Kebersihan yang Baik

☐ Others (Please specify):
Lain-Lain (Sila nyatakan): _____

4. If Halal Management System certified, which **year** the company obtained:

Sekiranya syarikat mendapat pengiktirafan Sijil Pengurusan Halal, tahun bilakah syarikat dapat:

5. Size of company (employees):
Saiz syarikat (pekerja):

☐ 5 to less than 75
5 hingga 75 orang pekerja

☐ 75 to less than 200
75 hingga 200 orang pekerja

☐ More than 200
Melebihi 200 orang

6. Company's sales turnover:

Pusing ganti jualan syarikat:

☐ Less than RM300,000
Kurang dari RM 300,000

☐ RM 300,000 to RM 15 Million
RM 300,000 hingga RM 15 Juta

☐ RM 15 Million to RM 50 Million
RM 15 Juta hingga RM 50 Juta

☐ More than RM 50 Million
Melebihi RM 50 Juta

7. Company's location:
Lokasi syarikat:

☐ Johor	☐ Kedah
☐ Kelantan	☐ Melaka
☐ Negeri Sembilan	☐ Pahang
☐ Perak	☐ Perlis
☐ Pulau Pinang	☐ Sabah
☐ Sarawak	☐ Selangor
☐ Terengganu	☐ WP (Kuala Lumpur)
☐ WP (Putrajaya)	☐ WP (Labuan)

INSTRUCTION FOR SECTION B, C, D, E & F/ ARAHAN UNTUK BAHAGIAN B, C, D, E & F

You are required to click the best statement that describes your company based on the scale provided.
Anda diminta menanda pernyataan terbaik yang menerangkan syarikat anda berdasarkan skala yang disediakan.

Section B : Technology and innovation.
Bahagian B: Teknologi dan inovasi

	My company has.... Syarikat saya memiliki...	Strongly Disagree 1	Disagree 2	Undecided 3	Agree 4	Strongly Agree 5
1.	Equipment that aligned with the Halal standard requirements. <i>Peralatan yang selari dengan piawaian Halal.</i>					
2.	Tools that assisted to produce more output					

	<i>Alat yang membantu menghasilkan lebih banyak pengeluaran</i>					
3.	Technology that improved production control. <i>Teknologi yang meningkatkan kawalan pengeluaran</i>					
4.	Technology that reduced production costs. <i>Teknologi yang mengurangkan kos pengeluaran.</i>					
5.	Technology that increased the output quality in manufacturing processes. <i>Teknologi yang meningkatkan kualiti pengeluaran dalam proses pengilangan.</i>					
6.	Innovated the products to comply to Halal standard <i>Menginovasikan produk untuk mematuhi piawaian Halal.</i>					
7.	Innovated the processes to comply with Halal standards. <i>Menginovasikan proses untuk mematuhi piawaian Halal</i>					
8.	Innovated the products to align with quality requirements. <i>Inovasi produk bersesuaian dengan keperluan kualiti..</i>					
9.	Innovated the tools that increased productivity. <i>Peralatan berinovasi yang meningkatkan produktiviti.</i>					

Section C : Top management and organizational readiness
Bahagian C: Pengurusan atasan dan kesediaan organisasi

	In my company.... <i>Dalam syarikat saya....</i>	Strongly Disagree 1	Disagree 2	Undecided 3	Agree 4	Strongly Agree 5
1.	Top management is interested to maintain Halal standards. <i>Pengurusan atasan berminat untuk mengekalkan piawaian Halal.</i>					
2.	Top management invests budget on Halal standard <i>Pengurusan atasan telah</i>					

	<i>melaburkan perbelanjaan untuk melaksanakan piawaian Halal</i>					
3.	Top management concerns about Halal standard implementation <i>Pengurusan atasan mementingkan perlaksanaan piawaian Halal</i>					
4	Top management provides Halal training to employee <i>Pengurusan atasan menyediakan latihan berkaitan Halal kepada pekerja.</i>					
5.	Top management offers strategy realignment on Halal standard <i>Pengurusan atasan menyelaraskan strategi untuk melaksanakan piawaian Halal</i>					
6.	Employee is aware of new technology in production. <i>Pekerja menyedari tentang penggunaan teknologi dalam pengeluaran.</i>					
7.	Staff adapts innovation for new product development. <i>Pekerja dapat menyesuaikan diri dengan inovasi dalam pembangunan produk baru.</i>					
8.	Employee understands the operations for Halal standard <i>Pekerja memahami operasi piawaian Halal</i>					
9.	Employee understands Halal system documentation and record <i>Pekerja memahami dokumentasi dan rekod sistem Halal</i>					
10	Staff complies with Halal standards in production. <i>Pekerja mematuhi piawaian Halal dalam pengeluaran produk.</i>					

Section D : Government support and Halal market demand.
Bahagian D: Sokongan kerajaan dan permintaan pasaran Halal

	My company acquired.... <i>Syarikat saya mendapat...</i>	Strongly Disagree 1	Disagree 2	Undecided 3	Agree 4	Strongly Agree 5
1.	Government's financial support. <i>Sokongan kewangan daripada Kerajaan.</i>					
2.	Government's infrastructures for Halal standard implementation. <i>Prasarana kerajaan untuk melaksanakan piawaian Halal</i>					
3.	Government's support on Halal business. <i>Sokongan kerajaan dalam perniagaan berasaskan Halal.</i>					
4	Information from government on Halal expansion opportunities <i>Maklumat daripada kerajaan mengenai peluang memperkembangkan perniagaan Halal</i>					
5.	Benefits from government's engagements through Halal training and conference <i>Faedah daripada penglibatan dengan kerajaan melalui latihan dan konferens Halal</i>					
6.	Market demand for Halal food. <i>Permintaan pasaran terhadap makanan Halal.</i>					
7.	Preferences of products when implementing Halal standard <i>Pilihan produk apabila melaksanakan piawaian Halal</i>					
8.	Market demand for current Halal production <i>Permintaan pasaran untuk pengeluaran Halal semasa</i>					
9.	Market demand for future Halal market <i>Permintaan pasaran untuk pasaran Halal masa hadapan</i>					
10	Community pressures for Halal certified production <i>Tekanan komuniti terhadap pensijilan Halal dalam pengeluaran</i>					

Section E : Knowledge management
Bahagian E: Pengurusan pengetahuan

	My company has.... Syarikat saya mempunyai...	Strongly Disagree 1	Disagree 2	Undec ided 3	Agree 4	Strongly Agree 5
1.	Awareness on <i>Halalan Toyyiban</i> <i>Kesedaran mengenai Halalan Toyyiban</i>					
2.	Knowledge on hygiene, sanitation and safety for Halal standard <i>Pengetahuan berkaitan kesihatan, kebersihan dan keselamatan dalam piawaian Halal</i>					
3.	Knowledge on Halal concept based on Shariah <i>Pengetahuan tentang konsep Halal berasaskan prinsip Syariah</i>					
4	Realization of religiosity on Halal standards adoption <i>Kesedaran agama terhadap penggunaan piawaian Halal</i>					
5.	Knowledge of Halal standards practices. <i>Pengetahuan mengenai amalan piawaian Halal</i>					
6.	Consciousness on Halal integrity in production <i>Kesedaran tentang integriti Halal dalam pengeluaran</i>					

Section F : Business performance relates to financial and non-financial
Bahagian F: Prestasi perniagaan berkaitan dengan kewangan dan bukan kewangan

	Compare to last year's performance, currently, my company has.... Prestasi perniagaan syarikat saya mempunyai..	Strongly Disagree 1	Disagr ee 2	Undeci ded 3	Agree 4	Strongly Agree 5
1.	Increased in sales <i>Peningkatan dalam jualan</i>					
2.	Improved in profitability <i>Peningkatan dalam keuntungan</i>					
3.	Improve market share. <i>Peningkatan perkongsian pasaran.</i>					

4.	Better financial liquidity. <i>Kecairan Kewangan yang lebih baik.</i>					
5.	Increased production delivery speed <i>Peningkatan dalam kelajuan pengeluaran produk</i>					
6.	Increased production volume <i>Peningkatan jumlah pengeluaran</i>					
7.	Increased production capacity flexibility <i>Peningkatan fleksibiliti keupayaan pengeluaran</i>					
8.	Improved conformance of quality <i>Penambahbaikan dalam kualiti pematuhan</i>					
9.	Better brand image. <i>Imej jenama yang lebih baik</i>					
10.	Increased consumers satisfaction <i>Peningkatan pujian pengguna</i>					
11.	Increased consumer loyalty <i>Peningkatan kesetiaan pengguna.</i>					
12.	Improved business competitiveness <i>Penambahbaikan daya saing perniagaan</i>					

Please put your comments (if any):
Sila berikan komen anda jika berkenaan:

Thank You

Appendix B

Letters for Data Collection



OTHMAN YEOP ABDULLAH GRADUATE SCHOOL OF BUSINESS
Universiti Utara Malaysia
06010 UUM SINTOK
KEDAH DARUL AMAN
MALAYSIA



Tel.: 604-928 7101/7113/7130
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Laman Web (Web): www.oyagsb.uum.edu.my

UUM/OYAGSB/R-4/4/1
14 December 2020

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

LETTER OF RECOMMENDATION FOR DATA COLLECTION AND RESEARCH WORK

This is to certify that **NAINATUL FARZUHA NOR (Matric No.: 903778)** is a student of Othman Yeop Abdullah Graduate School of Business, Universiti Utara Malaysia pursuing her Doctor of Philosophy (PhD). She is conducting a research entitled ***"The Influence of System Interaction on Halal Business Performance in Small-Medium Enterprise Food Manufacturers"*** under the supervision of Assoc. Prof. Dr. Hartini binti Ahmad and Dr. Ahmad Shabudin bin Ariffin.

In this regard, we hope that you could kindly provide assistance and cooperation for her to successfully complete the research. All the information gathered will be strictly used for academic purposes only.

Your cooperation and assistance is very much appreciated.

Thank you.

"SERVING THE NATION"
"KNOWLEDGE VIRTUE SERVICE"

Yours faithfully

ROZITA BINTI RAMLI
Assistant Registrar
for Dean
Othman Yeop Abdullah Graduate School of Business

c.c - Supervisor
- Student's File (903778)

Universiti Pengurusan Terkemuka
The Eminent Management University

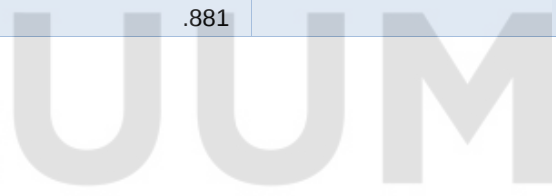


Appendix C Pilot Test

Case Processing Summary			
		N	%
Cases	Valid	30	100.0
	Excluded ^a	0	.0
	Total	30	100.0

Reliability Statistics	
Cronbach's Alpha	N of Items
.881	63




 Universiti Utara Malaysia

Appendix D

Questionnaire Development

No	Items	Source
1.	Equipment that aligned with the Halal standard requirements	Haleem et al. (2019), Iskandar et al. (2012) and Ngah et al. (2014).
2.	Tools that assisted in producing more output	
3.	Technology that improved the production control	
4.	Technology that reduced the production costs	
5.	Technology that increased output quality in manufacturing processes.	

No	Items	Source
1.	Innovated the products to comply with Halal standard	Haleem et al. (2019), Iskandar et al. (2012) and Ngah et al. (2014).
2.	Innovated the process to comply with Halal standard	
3.	Innovated the products to align with quality requirements.	
4.	Innovated the tools to increase the productivity	

No	Items	Source
1.	Top management maintains Halal standard	Azmi et al. (2019), Fernando and Walters (2015), Ngah, et al. (2014).
2.	Top management invests budget on Halal standard	
3.	Top management is concerned about Halal standard implementation	
4.	Top management provides Halal training to employees	
5.	Top management offers strategy realignment on Halal standard	

No	Items	Source
1.	Employee awareness of new technology in production	Azmi et al. (2019) and Tarmizi et al. (2014)
2.	Employee adapts innovation for new product development	
3.	Employee understands the operations for Halal standard	
4.	Employee understands Halal system documentation and record	
5.	Employee complies with Halal standards in production	

No	Items	Source
1.	Government's financial support	Azmi et al. (2019), and Zailani et al. (2015)
2.	Government's infrastructures for Halal standard implementation	
3.	Government's support for Halal business	
4.	Information from the government on Halal expansion opportunities	
5.	Benefits from government's engagements through Halal training and conference	

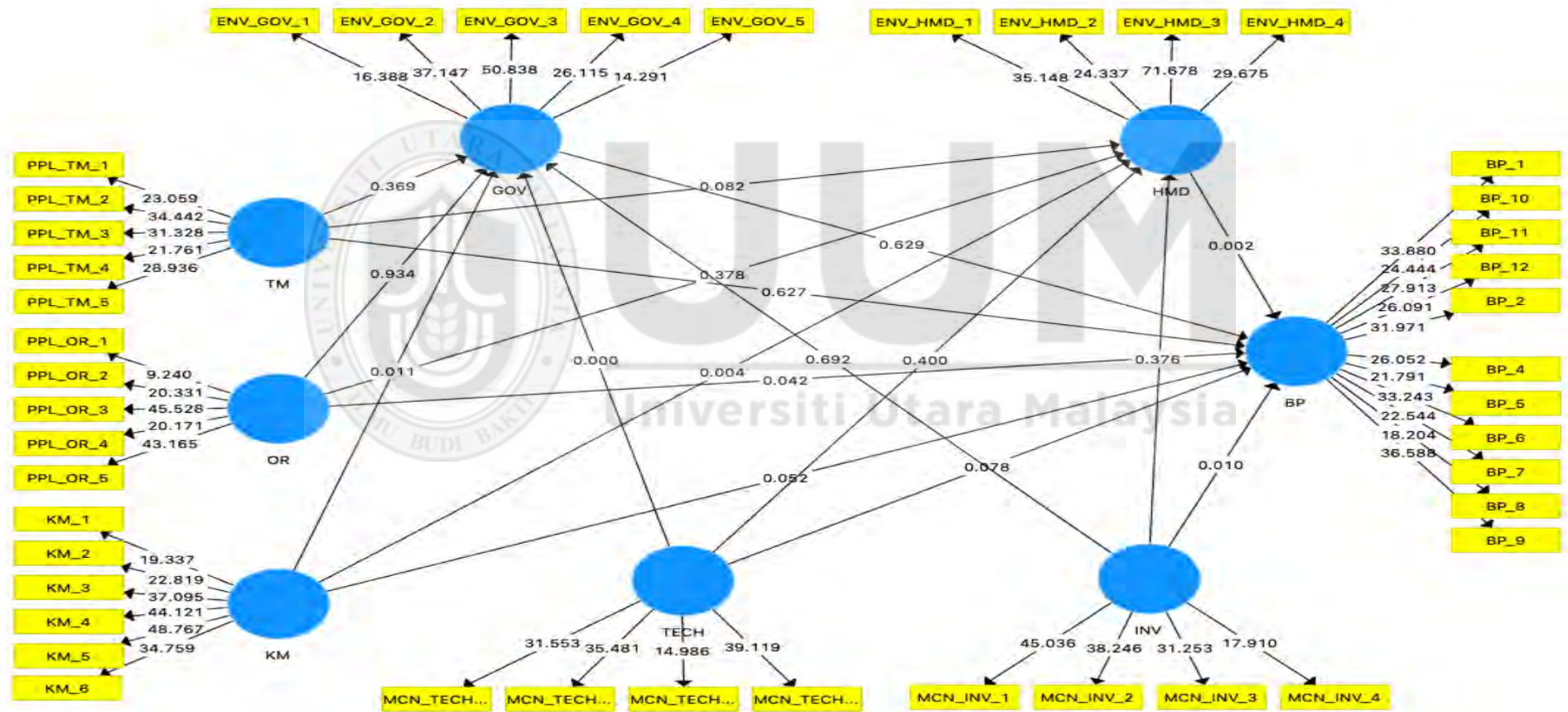
No	Items	Source
1.	Market demand for Halal food	Azmi et al., (2019), Fernando et al. (2015), and Zailani et al. (2015)
2.	Preferences of products when implementing Halal standard	
3.	Market demand for current Halal production	
4.	Market demand for future Halal market	
5.	Community pressures for Halal-certified production	

No	Items	Source
1.	Awareness on <i>Halalan Toyyiban</i> based on Shariah	Parhan and Rishawati (2015).
2.	Knowledge of hygiene, sanitation and safety for Halal standard	
3.	Knowledge of improvement goals in Halal	
4.	Realization of technology on Halal standards adoption	
5.	Knowledge of Halal and safety standards practices.	
6.	Consciousness of Halal integrity in production	

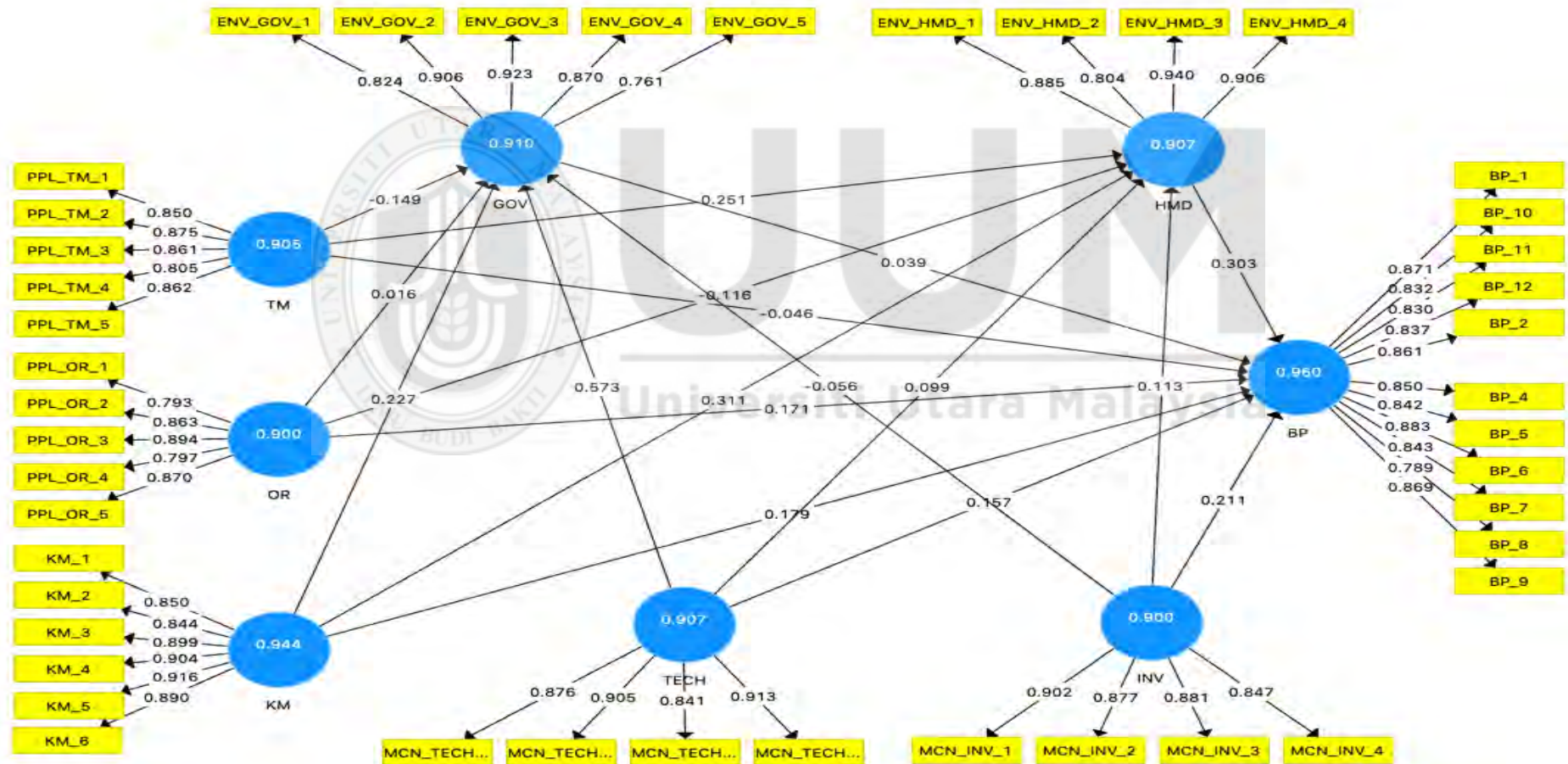
No	Items	Source
1.	Increased in sales	Masrom et al. (2017), Shah Alam (2011), Marzuki et al (2012), Zailani et al (2015), Dobni (2008) and Nurul (2020).
2.	Improved in profitability	
3.	Improved market share	
4.	Better financial liquidity	
5.	Increased production delivery speed	
6.	Increased production volume	
7.	Increased production capacity flexibility	
8.	Improved conformance of quality	
9.	Better brand image	
10.	Increased consumers' satisfaction	
11.	Increased consumer loyalty	
12.	Improved business competitiveness	



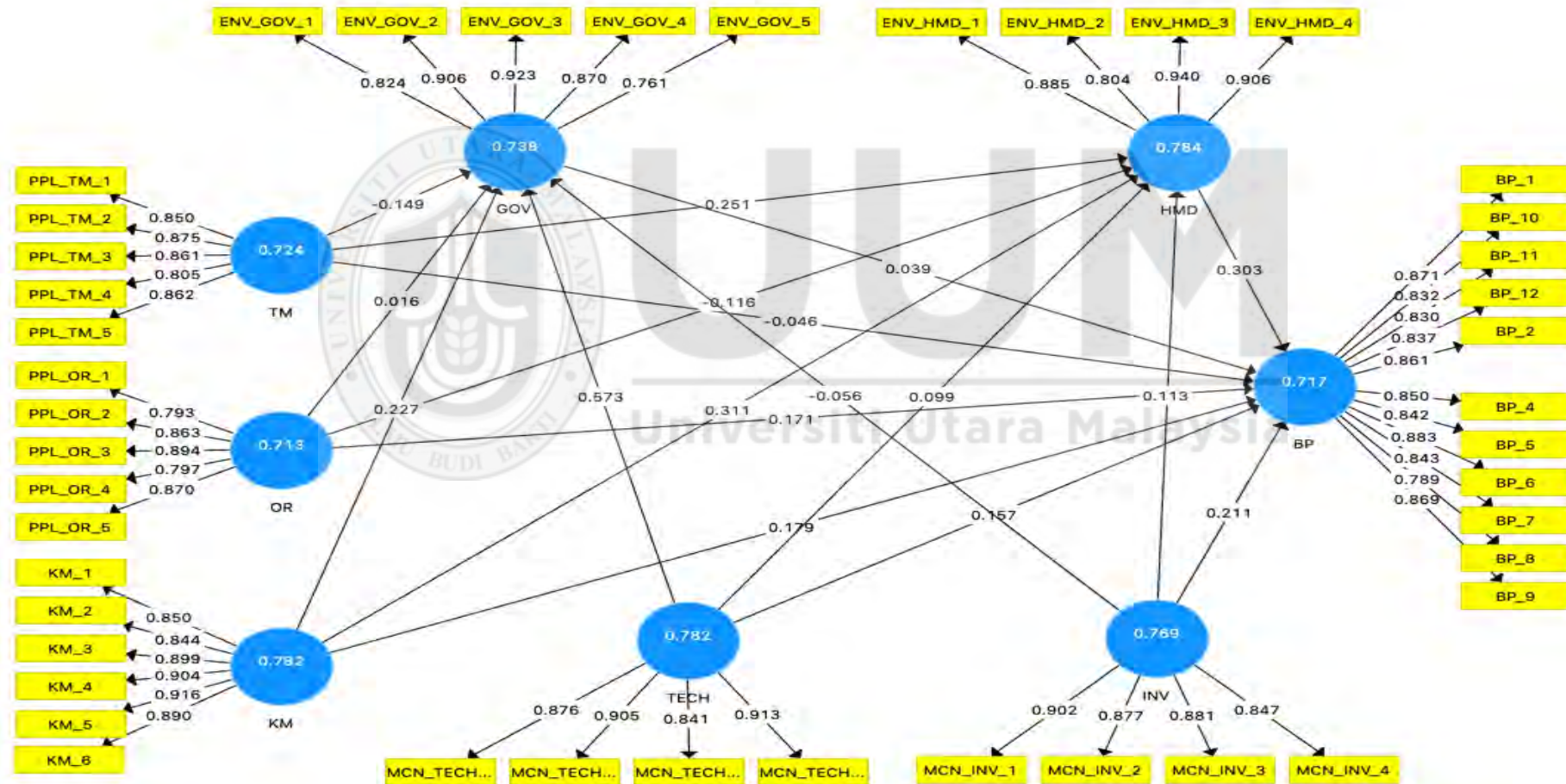
Appendix E Model of Study



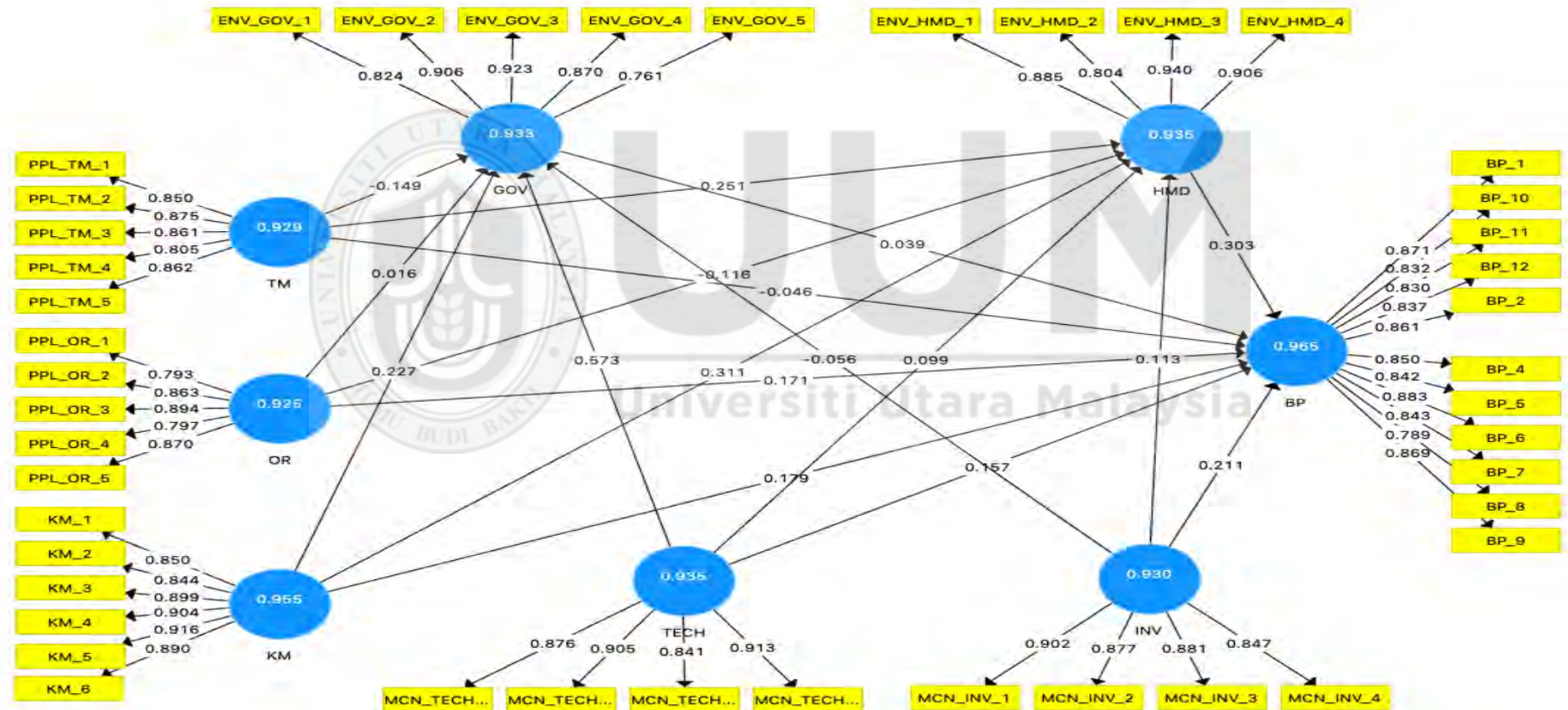
Appendix F Cronbach Alpha



Appendix G AVE

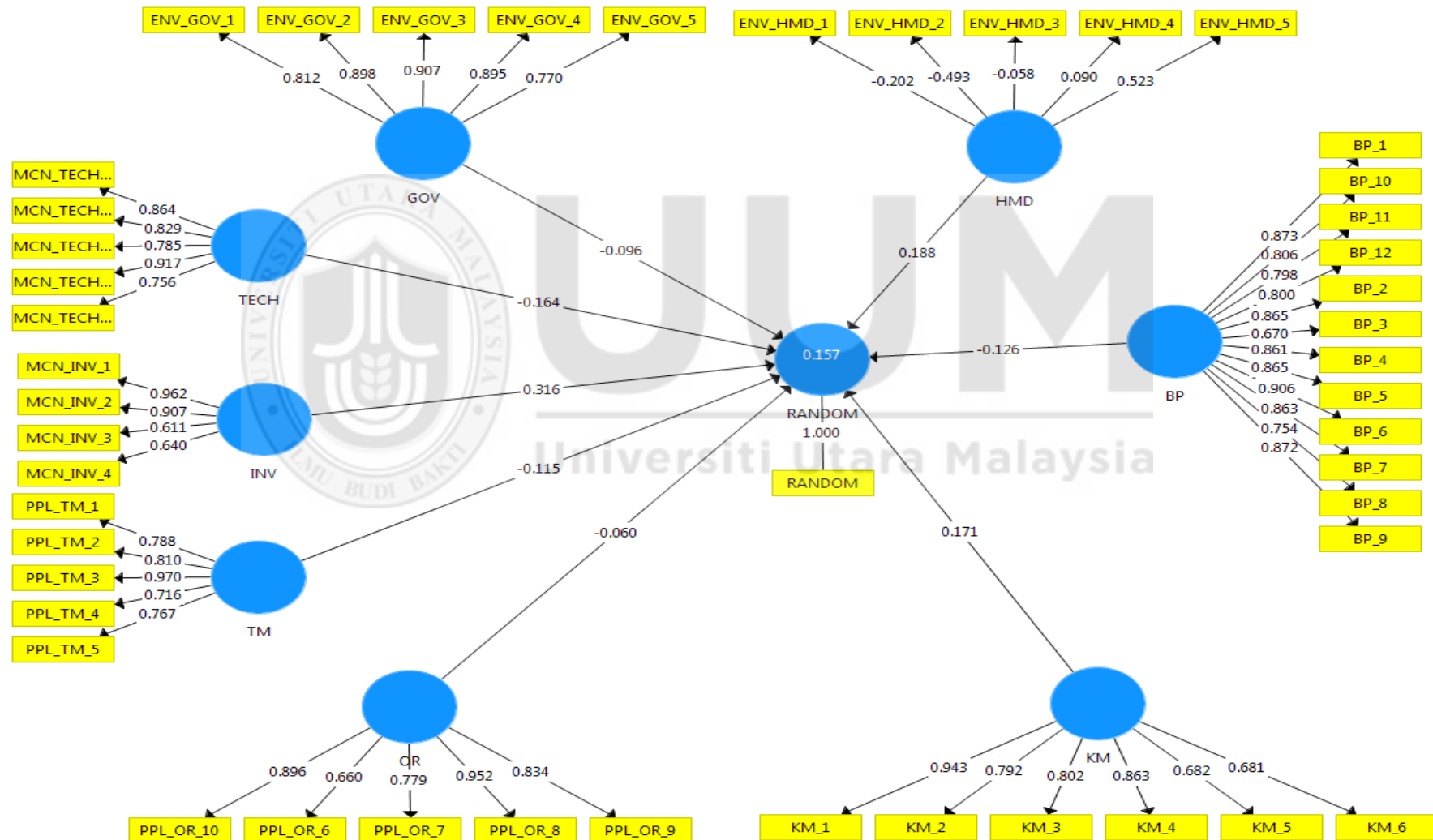


Appendix H Reliability



Appendix I

Common Method Variance



Appendix J
Discriminant Validity Assessment

	Business Performance	Government	Halal Market Demand	Environment	Knowledge Management	Organizational Readiness	Technology	Top Management
Business Performance	0.847							
Government Support	0.416	0.859						
Halal Market Demand	0.581	0.365	0.885					
Innovation	0.619	0.369	0.409	0.877				
Knowledge Management	0.543	0.303	0.492	0.472	0.884			
Organizational Readiness	0.572	0.346	0.355	0.615	0.475	0.845		
Technology	0.567	0.548	0.319	0.695	0.322	0.644	0.884	
Top Management	0.539	0.230	0.464	0.604	0.600	0.755	0.462	0.851

Appendix K
Path Coefficient

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P-values
Government Support -> Business Performance	0.039	0.039	0.080	0.483	0.629
Halal Market Demand -> Business Performance	0.303	0.294	0.098	3.105	0.002
Innovation -> Business Performance	0.211	0.198	0.082	2.567	0.010
Innovation -> Government	-0.056	-0.057	0.142	0.396	0.692
Innovation -> Halal Market Demand	0.113	0.097	0.127	0.885	0.376
Knowledge Management -> Business Performance	0.179	0.187	0.092	1.941	0.052
Knowledge Management -> Government	0.227	0.223	0.089	2.551	0.011
Knowledge Management -> Halal Market Demand	0.311	0.310	0.108	2.880	0.004
Organizational Readiness -> Business Performance	0.171	0.181	0.084	2.035	0.042
Organizational Readiness -> Government	0.016	0.004	0.195	0.082	0.934
Organizational Readiness -> Halal Market Demand	-0.116	-0.118	0.131	0.882	0.378
Technology -> Business Performance	0.157	0.165	0.089	1.764	0.078
Technology -> Government	0.573	0.577	0.137	4.188	0.000
Technology -> Halal Market Demand	0.099	0.104	0.118	0.842	0.400
Top Management -> Business Performance	-0.046	-0.053	0.096	0.486	0.627
Top Management -> Government	-0.149	-0.130	0.166	0.899	0.369
Top Management -> Halal Market Demand	0.251	0.267	0.144	1.740	0.082