Adoption Intention of Halal Traceability System among Agro-Food SMEs

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ABSTRACT

Traceability system enables agro-food small and medium enterprises (SMEs) to record the information about attributes of their products along the supply chain effectively. However, a huge concern arises among consumers regarding a violation of halal food products. Halal traceability system affirms that halalness should be retained across the supply chain. The adoption of the system in which the level of complexity is the same as the traceability system is still low despite the high usage of computers and the internet by most SMEs in Malaysia. This study aimed to determine the adoption intention level of halal traceability system among agro-food SMEs. A preliminary study was conducted on randomly selected 26 agro-food SMEs. Responses from agro-food SMEs were obtained through semi-structured interviews using a structured questionnaire. The data were analysed using several statistical analyses such as descriptive analysis, mean ranking analysis, and Chi-square analysis. The results revealed that most agro-food SMEs involved in this study (15 companies, 57.7%), were categorized as a small-sized company. Further, based on the mean ranking analysis, the results showed that agro-food SMEs have a low adoption intention of halal traceability system (mean score of 3.91). The results of Chi-square analysis revealed that there was a significant association between the size of the company and the adoption intention of halal traceability system among agro-food SMEs (p=0.073). This study concludes that more

exposure to recent advances to agro-food SMEs in Malaysia will improve their adoption intention of halal traceability system.

Keywords: *Adoption, Agro-food SMEs, Halal, Intention, Traceability System*

INTRODUCTION

Small and medium enterprise (SME) is one of the major contributors to Malaysia's Gross Domestic Product (GDP). The Department of Statistics Malaysia (DOSM) (2018) recorded that SMEs have contributed about 36.6% to Malaysia's GDP in 2016 and has increased to 37.1% in 2017. The increment was contributed by five sectors in SMEs, namely agriculture, mining and quarrying, manufacturing, services, and construction. Out of these five sectors, the increment was reported mainly in the manufacturing sector (0.1%), services sector (0.3%), and construction sector (0.1%) from 2016 to 2017 while the other sectors remain the same. Besides, DOSM (2017) had stated that the annual growth of SMEs value added in the manufacturing sector showed a rise of 6.8% in 2017 compared to 2016, which was 4.8%. Food, beverage, and tobacco sub-sectors led the increment in which increased to 11.0% in 2017 compared to 2016 which was 2.9%. These statistics explain the expansion of food, beverage, and tobacco sub-sectors in SMEs.

SMEs have dominated the Malaysian food industry which commonly based on cultures and Asian tastes. As the Malaysian food and beverage industry showed a rapid development from time to time, it becomes an appealing sector for the entrepreneurs. Nowadays, the demand for healthy and safe food has increased as consumers realize health-conscious food as the demand for nutritious food, functional food, and green food alongside the consumption of halal and organic food (Hai et al., 2017). Hence, the halal industry provides a great opportunity for Malaysian producers and manufacturers. As they become halal-certified companies, apart from producing high-quality products with good sanitation, all the procedures also are Shariah compliance (Italian Trade Agency, 2018). This will be good for their market share as most of the population in Malaysia are Muslim consumers in which Malaysia could indirectly fulfil the demand for halal products for its own country.

However, there is a huge concern among consumers regarding a violation of halal food products along the supply chain, which is needed to be put under consideration by the food manufacturers and producers. Muslim consumers are attentive in assessing their dietary consumption concerning the obligation towards religion. These concerns arise as halal issues occur from year to year. In 2018, it has been reported by major newspapers in Malaysia like Kosmo, Berita Harian, and Utusan Malaysia that many companies presented fake and doubtful halal logos on their products. These issues somehow triggered queries among Muslim consumers regarding the effectiveness of halal food traceability system in the markets (Nuar, 2018; Othman, 2018; Yahya, 2018).

An effective traceability system is important in Malaysia to reduce the occurrence of halal issues in the food industry (Zailani et al., 2010; Shafii & Khadijah, 2011; Mohamed et al., 2016; Poniman et al., 2015). Halal traceability system could enhance the halal transparency along the supply chain as it can boost consumers' trust towards the food that they will consume. Halal traceability system affirms that halalness should be retained across the supply chain, which is also one of the important elements in halal supply chain management. To perpetuate the product information and the halal status along the supply chain, a fully integrated supply chain is crucial to ensure both inbound and outbound logistics are concurrent with the halal traceability system (Usman et al., 2018).

However, the adoption of other systems by most SMEs in Malaysia such as intranet, extranet, e-commerce marketplace, and customer relationship management (CRM) systems, in which their level of complexity is the same as the traceability system are still low although computers, smartphones, and the internet had been used extensively in managing their business (SME Corp Malaysia, 2017). SMEs in Malaysia afflicted by immense retrogression basically because they are not ready to face the forthcoming challenges (Thurasamy et al., 2009). This issue arises because of the hassle faced by SMEs in adopting technological advances as they have a weak technological base, limited utilization of information technologies, and lack of workforce (Chin et al., 2012).

In the nutshell, the violation of the halal food products along the supply chain by the producers and manufacturers in the food industry had

triggered a huge concern among consumers. As most of the population in Malaysia are Muslim consumers, they are more sensitive in choosing their consumption. This situation needs to be considered by the manufacturers and producers particularly SMEs as if they want to retain and regain the customers and strengthening the market share. The adoption of these systems by SMEs is still low. There must be a gap that triggers this situation as SMEs' usage of computers, smartphones, and the internet are on the contrary high. Therefore, the concern is whether there are barriers that cause the low adoption of these systems which will also affect their intention to adopt halal traceability system.

This study aimed to determine the adoption intention level of halal traceability system among agro-food SMEs. This study hoped not only to provide SMEs with a way to enhance their efficiency in managing the business and improving their proficiency in handling and adopting advanced technology but to identify the gap that causes SMEs to be reluctant in adopting advanced technology in managing their business operations.

REVIEW OF LITERATURE

Size of Company

Many studies revealed the existence of a positive relationship between IT adoption and the size of the company. According to Das and Das (2012), there is a positive relationship between the size of the company and the adoption of information technology (IT) while Mhenni et al. (2011) described that there is a positive correlation between the company's size and the adoption of information and communication technology (ICT). Implementing IT and information system (IS) in general has a positive relationship with the size of the company where most of medium-sized and large companies adopting several systems namely enterprise resource planning (ERP) (Laukkanen, 2007; Tagliavini et al., 2002), supply chain management (SCM) (Shin, 2006); and customer relationship management (CRM) (Torggler, 2009). As further argued by Nugroho et al. (2017) that SMEs have a high tendency to adopt information and communication technology (ICT) as the companies grow bigger because they faced lower levels of the financial hindrance.

Year of Establishment

Year of establishment of the company refers to the age of the company in the industry. The level of experience and perceived risk of information technology (IT) faced by a company was determined by the year of establishment of the company (Giunta & Trivieri, 2007; Gambardella & Torrisi, 2001). Das and Das (2012) addressed that there are significant relationships between the year of establishment of the company and the adoption of information technology (IT). However, Mheni et al. (2011) discovered that year of establishment of the company does not have a significant relationship with the adoption of ICT except for the company that established over ten years in the industry. Based on the technological experience of the old companies, they are most probable to face high switching costs (Khalifa, 2016; Hollenstein, 2004). As further argued by Bessen (2002) companies will be incurred high adoption costs as they switching to the new technologies.

Sales Turnover

Sales turnover is referred to as the sum of money which was gained by a company from the sales of products or services in a certain period. Although the main reason for companies reluctant to adopt advanced technology is because of low sales turnover but according to Nugroho et al. (2017) turnover and assets earned by SMEs are not the foundation of declining the use of information technology (IT). The sum of sales turnover is one factor that influences SMEs' perspective towards the innovation of technology apart from becoming an entrepreneurial group member, having several business outlets through the market and employee population (Rahman & Ramos, 2014; Bayo-Mariones & Lera-Lopez, 2007).

Business Ownership

There are a few types of business ownership, namely sole proprietorship, partnership and limited company as each of them has its advantages and disadvantages. According to Skripak (2016), the owner of the sole proprietor firm controls the business and the profit earned by the business. Besides, a partnership offers the advantage to generate ideas for the firm as it comprises a group of people with diverse talent and responsible. Another type of business which is differed from sole proprietor and partnership is a limited

company where the members do not require committing to the debt of the company. Majumdar et al. (2012) described public limited companies had a higher proportion of sales compared to private limited companies and unincorporated firms which are corporate-oriented and low adoption of advanced technology. Besides, business ownership plays a crucial role in affecting firm company behaviour (Morck et al., 2005; Stiglitz, 2006).

Food Traceability System

Zhang and Zou (2017) claimed food traceability system along the supply chain was placed under scrutiny because of the frequent occurrence of the food crisis. To improve the level of food security, the traceability system in which connecting all the players in the supply chain are crucial (Cao et al., 2017). Traceability is a tool that assures consumers' safety and facilitates firms in managing production. Besides, the traceability system could improve companies' performance by minimizing the risk of a product recall (Comba et al., 2013). Furthermore, Alfaro and Rabade (2009) described the traceability system could be a competitive advantage for a company to be in the market. The latest advances in food traceability system could increase the efficiency and effectiveness by using a technological advance device such as radio-frequency identification (RFID) and near-field communication (NFC) (Badia-Melis et al., 2015). Dominating the complexity of the traceability system throughout the supply chain to establish a successful traceability system is the hardest thing to be done (Morana, 2016). There are several barriers for a firm to adopt traceability systems such as lack of expertise, difficulty in processing volume data, and the absence of computer tools (Lazzeri & Febbe-Costes, 2014). Furthermore, the main constraint for a firm to adopt food traceability system is the difficulty in changing the work process (Dediu et al., 2016). However, Morana (2016) claimed food traceability system is a crucial tool for a company to overcome the ethical problem and challenges in management such as consistency, standardization, domination of general affairs, and training.

Halal Traceability System

Mohamed et al. (2016) suggested a model of a local halal food supply chain is needed for establishing an effective halal traceability system for the food industry in Malaysia. Besides, the framework of traceability in halal

food supply chain is a useful tool in assisting all parties who are directly and indirectly involved in halal food manufacturing (Poniman et al., 2015). Traceability systems are important among SMEs along the halal supply chain as it can diminishes halal issues that arise such as fake halal logos, product contamination, and lower confidence among consumers about halal products (Abd Rahman et al., 2017). Halal traceability and halal tracking is a new technique introduced which is rapidly strengthened from time to time (Zailani et al., 2010). An integrated traceability system allows all players along the halal supply chain to track and trace any process that is required (Abd Rahman & Abdul, 2017). To ensure the product information can be traced and tracked, efficient handling of documents and communication between the players is important (Usman et al., 2018). Awareness, understanding, action, and transparency are the crucial elements that need to be strengthened as a basic aspect for traceability in halal supply chain (Samsi et al., 2015). According to Shafii and Khadijah (2011), a company is considered as adopting halal traceability system if they execute a full-scale traceability system which at the same time follows the Shariah requirements for halal production.

METHODS OF STUDY

A preliminary study was conducted with 26 agro-food SMEs in Peninsular Malaysia. According to Hill (1998), the appropriate number of respondents for a preliminary study is between 10 and 30. Therefore, this study was acceptable as the respondents fell under the suggested range. Based on the directory provided by the Department of Islamic Development Malaysia (JAKIM), the target respondents were selected using a systematic random sampling method. The most appropriate source for this study was the primary data as this study focused on identifying the behavioural intention of agro-food SMEs. A structured questionnaire was established and used as an instrument for semi-structured interviews. The questionnaire was constructed in the form of open-ended and closed-ended questions to help the respondents to give quick answers. The wording of the questionnaire was designed in positive statements and straightforward to avoid any misunderstanding during the survey. The statements about the adoption intention of halal traceability system among agro-food SMEs were developed using a 5-point Likert Scale ranging from 1 - strongly disagree,

2 - disagree, 3 - neither agree nor disagree, 4 - agree, to 5 - strongly agree. The data were analysed using several statistical analyses such as descriptive analysis, mean ranking analysis, and Chi-square analysis.

Figure 1 shows the conceptual framework established for this study. The relevant variables used to establish the conceptual framework were adapted from previous studies (Mheni et al., 2011; Das and Das, 2012; Rahman & Ramos, 2014; Skripak, 2016).
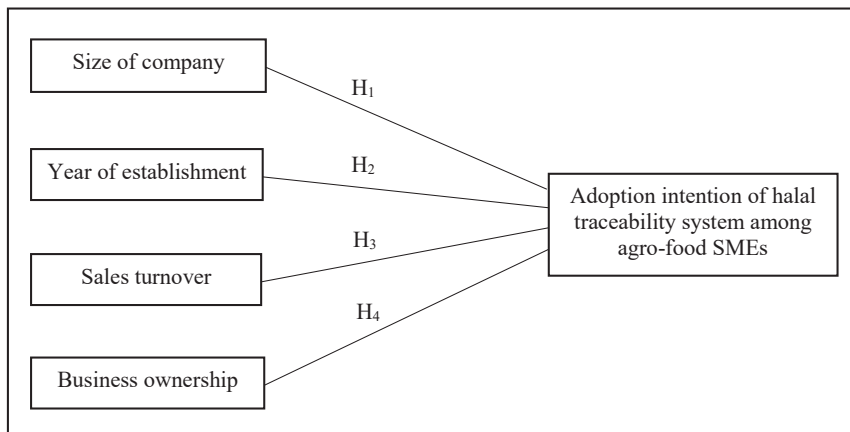

Figure 1: Conceptual Framework of Adoption Intention of Halal Traceability System among Agro-Food SMEs
Source: Mheni et al. (2011); Das and Das (2012);
Rahman & Ramos (2014); Skripak (2016)

The hypotheses established for this study are as follows: -

H_0 - Size of company has no association with adoption intention of halal traceability system among agro-food SMEs
H_1 - Size of company has an association with adoption intention of halal traceability system among agro-food SMEs

H_0 - Year of establishment has no association with adoption intention of halal traceability system among agro-food SMEs
H_2 - Year of establishment has an association with adoption intention of halal traceability system among agro-food SMEs

H_0 - Sales turnover has no association with adoption intention of halal traceability system among agro-food SMEs

H_3 - Sales turnover has an association with adoption intention of halal traceability system among agro-food SMEs

H_0 - Business ownership has no association with adoption intention of halal traceability system among agro-food SMEs

H_4 - Business ownership has an association with adoption intention of halal traceability system among agro-food SMEs

RESULTS AND DISCUSSION

The discussions on the results are based on several statistical analyses such as descriptive analysis, mean ranking analysis, and Chi-square analysis.

Firmographic Profiles

Descriptive analysis was used to analyse the firmographic profiles of agro-food SMEs such as size of company, year of establishment, sales turnover, and business ownership. The results revealed that out of 26 agro-food SMEs involved in this study, 2 companies (7.7%) were categorized as a medium-sized company, 15 companies (57.7%) were categorized as a small-sized company and the remaining 9 companies (34.6%) were categorized as a micro-sized company. This study also showed that 15 companies (57.7%) were in the category of private limited, whereas 9 companies (34.6%) and 2 companies (7.7%) were in the category of sole proprietor and partnership, respectively. Most of the agro-food SMEs (80.8%) gained more than RM50,000 while the remaining (19.2%) of them gained less than RM50,000 for annual sales turnover. The results also showed that most SMEs (69.2%) were in the operation in the food industry for over 5 years. Table 1 summarizes the results obtained from the descriptive analysis.

Table 1: Summary of Firmographic Profiles

	Profiles	Frequency (n)	Percentage (%)
Size of company	Micro	9	34.6
	Small	15	57.7
	Medium	2	7.7
Year of establishment	≤ 5 years	8	30.8
	>5 years	18	69.2
Sales turnover	≤ RM50,000	5	19.2
	>RM50,000	21	80.8
Business ownership	Sole proprietor	9	34.6
	Partnership	2	7.7
	Private limited	15	57.7
Total		**26**	**100**

Level of Adoption Intention of Halal Traceability System

The reliability test was carried out to test whether each item analysed could produce consistent results. For this study, each item on the adoption intention of halal traceability system among agro-food SMEs was analysed prior to mean ranking analysis. The result of Cronbach's alpha (α) showed 0.965, passing the suggested tolerance which is >0.7 and according to Fornell and Larcker (1981), it is good and can be used for further analyses. The mean ranking analysis was next carried out to analyse the level of agro-food SMEs' adoption intention of halal traceability system in their business. Table 2 shows a summary of the results of the mean ranking analysis. Eight (8) statements of intention to adopt halal traceability system was analysed. The highest mean score of 4.0 was for the statement "*We intend to adopt halal traceability system in the future.*" Meanwhile, the lowest mean score of 3.51 was for the statement "*We intend to learn about using halal traceability system.*" Based on the mean ranking analysis, the result revealed the average mean score was 3.91 with an average standard deviation of 0.934, indicating the data points are close to the expected value. In this study, a mean score of 4.00 and above is considered as a high adoption intention level while a mean score of below 4.00 is considered as a low adoption intention level. As the average mean score for agro-food SMEs in this study was below 4.00, thus indicating that agro-food SMEs have a low adoption intention level of halal traceability system. These adoption intention levels were parallel with Maffei et al. (2012).

Table 2: Mean Ranking Analysis

No	Statement	Mean	Standard deviation
1	We intend to adopt halal traceability system in the future.	4.00	0.938
2	We will take initiative to adopt halal traceability system in the future.	3.92	0.977
3	We intend to adopt halal traceability system as the profit gains by the firm are expected to be increased.	3.92	0.688
4	We plan to use halal traceability system to manage our business.	3.88	0.993
5	We have a high intention to use halal traceability system in our business.	3.87	0.952
6	We would use halal traceability system rather than an old method to trace the products.	3.85	0.925
7	We plan to invest in halal traceability system in our business.	3.72	0.821
8	We intend to learn about using halal traceability system.	3.51	1.021
	Average mean and standard deviation	**3.91**	**0.934**

Note: n = 26; 1= strongly disagree, 2= disagree, 3= neither agree nor disagree, 4= agree, 5= strongly agree

Association between Firmographic Profiles and Adoption Intention of Halal Traceability System

Chi-square analysis was used to determine the association between two nominal variables where it helps in comparing the expected value and the actual value of the data. This analysis was carried out to determine the association between firmographic profiles and adoption intention of halal traceability system among agro-food SMEs. Table 3 shows the results of Chi-square analysis.

Table 3: Result of Chi-Square Analysis between Firmographic Profiles and Adoption Intention of Halal Traceability System among Agro-Food SMEs

Firmographic profiles	Asymp Sig. (2 sided)	Decision
Size of company	**0.073***	**Reject** H_0
Year of establishment	0.334	Fail to reject H_0
Sales turnover	0.374	Fail to reject H_0
Business ownership	0.900	Fail to reject H_0

Note: *Significant at 10% level of significance

Based on the results, the only profile to show a significant association was the size of the company. The size of the company has a significant association with the adoption intention of halal traceability system among agro-food SMEs (p=0.073) at a 10% level of significance. Thus, H_0 was rejected. It can be described that the size of the company was the contributing factor to the adoption intention of halal traceability system among agro-food SMEs. This result was similar to the results of Das and Das (2012); Mhenni et al. (2011) that there was a positive relationship between company size and adoption of IT and ICT. Meanwhile, the other variables such as year of establishment, sales turnover, and business ownership were revealed not significant, showing that the variables did not have associations with adoption intention of halal traceability system among agro-food SMEs. Thus, H_0 was failed to be rejected.

CONCLUSION

The results of the preliminary study showed that agro-food SMEs have a low intention in adopting halal traceability system. The results further showed that the size of the company has a significant association with the adoption intention of halal traceability system among agro-food SMEs. Based on these main findings, a keen insight from the responsible entities is needed. Hence, this study recommends that more exposure to halal traceability system and its benefits will improve agro-food SMEs' adoption intention level of the system. The government should intensify its effort on the exposure of technological advances to agro-food SMEs. It can be done by educating them on how to use technological advances and provide financial support

for adopting a system for their business, especially among the micro and small-sized agro-food SMEs.

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