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Factors Influencing the Selection of Halal Products Using Fuzzy Analytic Hierarchy Process (AHP)

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Abstract

Researchers and academics are interested in this study because it aims to understand the factors and sub-factors that affect the selection of Halal products. The researcher was unaware of any prior research or studies conducted to ascertain how much consumers consider the factors and sub-factors influencing their decision to purchase Halal products and how consumers rate those variables. This paper aims to identify and rank the top factors and sub-factors that affect consumers' decisions to select Halal products in Perlis. Through the use of questionnaires, the information of three experts from Jabatan Agama Islam Perlis was gathered. This data was initially analysed using the Fuzzy analytical hierarchy process. The results, which were analyzed based on value after normalization, indicated that product awareness is the best factor and ranked first, while its sub-factor, which ranked first is religious responsibility towards the product, directly influences the choice of Halal products among the Perlis community. In light of the importance of Halal products, the researcher expects that this study will help the public consumer, product manufacturer, seller, other researchers, and shop owners by raising awareness about the importance of Halal products. This research is essential to promote community development globally in order to achieve the Sustainable Development Goals (SDGs), as well as to educate Malaysians and Muslims to search and choose the Halal products as a matter of religious obligation.

Keywords: Halal Products, Factors, Fuzzy AHP, Halal Products in Perlis

Introduction

Assessing and understanding consumers' decisions to buy Halal products has attracted academics and researchers' interest, especially in Islamic marketing. The term "Halal" refers to all permissible human actions and behavior, including eating, wearing, seeing, and speaking (Alzeer et al., 2018). The Muslim consumer market's needs and wants are largely shaped by their firm belief in the Islamic culture and its principles (Haque et al., 2019).

Malaysia is currently on track to becoming a developed country. As a result of this vision, Malaysia is less dependent on a single industry and instead has a wide range of economic generators that can contribute to the government's resources and economic growth. In this context, one of the most important sectors is the Halal food or product sector which is no longer merely an industry that complies with religious requirements to feed about 60 per cent of million Malaysians who are Muslims, but it is becoming an economic force in itself both domestically and globally (Ambali & Bakar, 2014).

The main reason for the expansion of the global Halal industry was the explosive growth of the Muslim population. Consequently, the use of Halal products is on the rise, as is the demand for Halal products. Most of the Perlis community choose food or product with good certification. Food items with reputable certifications would always be the choice for the most consumer. Not only Muslims but non-Muslims also choose the product with a Halal logo because the authorities guarantee it. The reason non-Muslim in Malaysia consume Halal food is because of reliable Halal certification, as non-Muslim consumers rely on guaranteed food safety (Lee et al., 2016). In such a challenging environment, choosing a Halal product is important, and the process of choosing Halal products is not too complex. Many factors affect the choice of Halal products, but the most crucial oes are product quality, product ingredients, product awareness and price.

In Islam, Halal means permissible. According to Shaari et al (2020), Halal comes from an Arabic word that means 'allowed' or 'valid' among Muslim consumers. This can be supported by Othman et al (2019), the Arabic word 'Halal' means permissible or legal. In putting greater emphasis, Ambali and Bakar (2014) claimed that Halal could also take any interpretation suggesting or probably be recognized as approval by the Islamic religion to consume specific things or utilize them. Not only the food product, but any kind of product also likes cosmetics and medical should be in a Halal status to fulfil the Halal concept. This statement is also agreed by Suki and Salleh (2016), Halal is a marketing term that refers to the permissibility of a service or product that believes in the teachings of the Holy Quran. Furthermore, in research based on observation by Sang-Hyeop Lee et al. (2016), cosmetics, equipment, attire, hospitality industry, the healthcare industry, and other kinds of businesses are all covered by the Halal concept.

The safety, production, packaging, and delivery to consumers are all factors in product quality. According to Ambali and Bakar (2014), Good Manufacturing Practice (GMP) is where the producers apply both manufacturing and quality control procedures to ensure the products are consistently manufactured to their specifications and Halal prescriptions that have been given by the Halal Certification Body. A good quality control is necessary to ensure that the product that have been chosen is free from any harm that can cause life risk. This can be endorsed by Alzeer et al (2018), food safety is absolutely essential for supporting life and conserving public health.

As stated by Aziz and Chok (2013), awareness refers to the ability to understand, to believe, and to be cognizant of events and objects. As a good consumer or purchaser, consuming a product with high awareness is a must, especially for Muslims, to avoid scepticism. This can

be supported by Sang-Hyeop Lee et al (2016), consuming food seems to be quite popular due to religious responsibility for Muslim, and some products can be consumed besides the case that has already been classified as Haram in the Islamic law. In placing more attention, Haque et al (2019) claimed that Muslim consumers should be intensely aware of the various aspects such as ingredients, process of manufacture, storage like other sources and elements that are related to it when purchasing a product. However, these claims can be debatable by Ambali and Bakar (2014), the dilemma appeared in manufactured products which consisted of hidden information. Although limited, this assertion by Ambali & Bakar (2014) can be enhanced by similar claims by Ariffin et al (2021) that internationally, food offences such as fraudulent activities and misappropriation of packaged foods are not a recent phenomenon. Aziz and Chok (2013) reasserted this, a good attitude is a beneficial view of Halal principles and Halal awareness.

According to Othman et al (2019), the ingredients used to establish Halal and tayyib compliance are primary factors. In addition, previous research by Ambali and Bakar (2014) stated that products and processed foods are only fully compliant with Islamic principles and are made from Halal raw materials and ingredients to be considered Halal. This statement also can be back up by Alzeer et al (2018), it is necessary to identify every ingredient used in the production to ascertain whether it is Halal or toxic. Ingredients that contain in the food and products is one of the factors that influence the selection of Halal products among Malaysia community. As claimed by Azam (2016), purchase intent is positively impacted by the composition of food ingredients. The consumer's theoretical and practical experiences understand the actual price of the service or product (Aransyah et al., 2019). Shaari et al (2019) stated that viewed price influences consumers' intentions to make purchases. This is also defendable by Chang (2017), an important consideration for a customer when deciding whether or not to purchase a product is perceived price. The important factor affecting the purchase of retail brands is value consciousness, which is concerned with the cost paid in relation to the quality received (Aransyah et al., 2019).

Multi Criteria Decision Making (MCDM) is a method in order to choose the best alternative. According to (“A Survey on Multi Criteria Decision Making Methods and Its Applications,” 2013), a variety of applications have been subjected to MCDM techniques in order to select the best answer. MCDM is a data science group that develops mathematical and computational tools to help selection in intuitively analysing performance requirements. For the purpose of choosing the best options, numerous MCDM techniques and concepts have been presented.

In the MCDM process, it is regarded as one of the most useful tools (Syazwan et al., 2016). The Fuzzy set theory enhances the comparison process's flexibility and capacity to contribute to experts' preferences because the traditional AHP only considers decision makers' specific decisions. According to Aruldoss (2013); T et al (2015), AHP systematically divides a challenging MCDM problem into steps.

According to Findawati et al (2018), the Fuzzy-AHP method is an advanced analytical approach from the AHP and is an effective tool for dealing with ambiguity in data when choosing between various decision variables. Many decision-making issues can be solved using this method. This study used Fuzzy AHP to choose the best Islamic pairs that meet all requirements.

Bhatt et al (2021) also utilized the Fuzzy AHP approach to examine and rank various factors influencing SMEs' decisions to adopt ERP, particularly in the Indian context. Khan et al. (2022) applied Fuzzy AHP in prioritizing the Halal food supply chain risks. The port of call for the cruise

was chosen using the Fuzzy AHP method (Wang & Xiong, 2022). Li et al (2017) proposed a hybrid approach based on Fuzzy AHP and a 2-tuple Fuzzy linguistic method to assess the quality of the in-flight service and better understand the preferences and perceptions of the passengers. A number of selection problems have been successfully solved using the Fuzzy AHP method.

Recently, the researchers Sidek et al (2022) used spearman rank to identify the relationship between consumer purchasing behaviour towards halal products among the Malaysian community with four factors which are product quality, product price, product ingredients, and product awareness. The results showed that consumer purchase behaviour for halal products is directly significant and positively correlated with all factors. This study also stated that according to Islamic teaching, all Muslims in the nation consume halal products as one of the religious obligations.

Regarding these issues, this study focuses on determining the best factors and subfactors influencing the selection of Halal products in Perlis using the Fuzzy-AHP method. Hence, this study uses the same four factors to determining the rank of the top factors and sub-factors that affect consumers' decisions to select Halal products in Perlis.

A high-quality product has all the features that consumers want. High levels of safety and hygiene are a sign of high-quality products. Additionally, products that do not even harm consumers or the environment and that are processed using Good Manufacturing Practice (GMP) reflect high-quality products. The dilemma of Halal is beginning to gain attraction in the marketplace, and it has a significant impact, especially in Islamic countries. Improper hygiene practices in processing facilities, the expiry dates of Halal certification and fake Halal logos are among the Halal issues that came up.

The knowledge and understanding of the Halal problem have become an important point of debate among the community as a crucial religious issue. The JAKIM Halal logo denotes that producers, operators, and shop owners of products adhere to the directives given by JAKIM. So, if a fake logo is being used, the product probably does not adhere to legal Halal standards. Community of Perlis are undoubtedly exposed to harmful products.

Objectives

Regarding these issues, the objectives of this paper are

- To determine the best factors influencing the selection of Halal products in Perlis using the Fuzzy-AHP method.
- To determine the subfactors influencing the selection of Halal products in Perlis using the Fuzzy-AHP method.

Methodology

In order to identify the relevant factors, three experts were given questionnaires on behalf of the Jabatan Agama Islam Perlis by the Halal officers. There are two components to the questionnaires. Section A includes inquiries regarding the expert's racial and ethnic background, job status, and level of education. Section B evaluates the factors, whereas Part C assesses the sub-factors for Section B. Four factors were identified namely product quality, product ingredients, product awareness and product price. Each factors later on was characterized by its sub-factor as shown as Table 1 below.

Table 1
Factors and Sub-factors of Halal Products

Factors	Sub-Factors
Product Awareness	Religious responsibility
	Aware of the various aspect
	Halal logo certified by JAKIM
Product Price	Choose price rather than taste
	Viewed Price
	Reasonable price based on income
Product Quality	Not harmful
	Good Manufacturing Process
	Safety and Hygienic
Product Ingredients	Material used not declared illegal by Islamic law
	Free from the non-Halal animal
	Ingredients labelling

To identify and rank the factors and sub-factors influencing the choice of Halal products in Perlis, this study used the Fuzzy AHP method. There are 11 steps in the process of using this method. Listed below are the steps of the process:

Step 1: The Triangular Fuzzy Number (TFN), is shown in Table 2, which is depicted by (*l, m, u*), is used to determine Fuzzy sets. *l* is the smallest possible value, *m* is the most promising value, and *u* is the largest possible value.

Table 2
The Triangular Fuzzy Number

Classic Saaty's Scale	Triangular Fuzzy Number	Linguistic Term	Triangular Fuzzy Reciprocal Number	Linguistic Term
1	(1,1,1)	Equally Important	(1,1,1)	Equally Unimportant
3	(2,3,4)	Moderate Important	(1/4,1/3,1/2)	Moderate Unimportant
5	(4,5,6)	Strong Important	(1/6,1/5,1/4)	Strong Unimportant
7	(6,7,8)	Very Strong Important	(1/8,1/7,1/6)	Very Strong Unimportant
9	(9,9,9)	Extremely Strong Important	(1/9,1/9,1/9)	Extremely Strong Unimportant
2	(1,2,3)	Values design for the evaluation of the so-called interphase.	(1/3,1/2,1)	Values design for the evaluation of the so-called interphase.
4	(3,4,5)		(1/5,1/4,1/3)	
6	(5,6,7)		(1/7,1/6,1/5)	
8	(7,8,9)		(1/9,1/8,1/7)	

Step 2: For each factor (criteria), the triangular Fuzzy scale is replaced in the pair-wise comparison matrix. The following Eq. (3.1) is an expression for the pairwise comparison matrix:

$$A_{ij}^{k}=\begin{bmatrix}(l_{11}^{k},m_{11}^{k},u_{11}^{k})(l_{12}^{k},m_{12}^{k},u_{12}^{k}) & \cdots & (l_{1n}^{k},m_{1n}^{k},u_{1n}^{k})\\ \vdots & \ddots & \vdots\\ (l_{n1}^{k},m_{n1}^{k},u_{n1}^{k})(l_{n2}^{k},m_{n2}^{k},u_{n2}^{k}) & \cdots & (l_{nn}^{k},m_{nn}^{k},u_{nn}^{k})\end{bmatrix} \quad (1)$$

where k denotes the number of experts, and A^{k}_{ij} denotes the TFN stating the preference of the k^{th} experts for the i^{th} criterion over the j^{th} criterion . Then, the pair-wise comparison matrix is formed from the triangular Fuzzy scale that experts assessed.

Since there are three experts, it is necessary for each expert's preference to have an average value, which is calculated using the below:

$$Average\ (l_{ij},m_{ij},u_{ij})=\frac{\sum_{k=1}^{k}(l_{nn}^{k},m_{nn}^{k},u_{nn}^{k})}{k} \quad (2)$$

The pair-wise comparison matrix is updated according to the average preference as depicted in Eq. (3).

$$A_{ij}=\begin{array}{c}\\ C_1\\ C_2\\ \vdots\\ C_n\end{array}\begin{array}{c}\begin{array}{cccc}C_1 & C_2 & \cdots & C_n\end{array}\\ \begin{bmatrix}(l_{11},m_{11},u_{11}) & (l_{12},m_{12},u_{12}) & \cdots & (l_{1n},m_{1n},u_{1n})\\ (l_{21},m_{21},u_{21}) & (l_{22},m_{22},u_{22}) & \cdots & (l_{2n},m_{2n},u_{2n})\\ \vdots & \vdots & \cdots & \vdots\\ (l_{n1},m_{n1},u_{n1}) & (l_{n2},m_{n2},u_{n2}) & \cdots & (l_{nn},m_{nn},u_{nn})\end{bmatrix}\end{array} \quad (3)$$

Step 3: Using a random generator to check the consistency index,
The values of the ratio index, RI, rely on how big the matrix, n, is. To calculate the consistency index (CI), the maximum lambda values are calculated using the equation below:

Lambda max = average of weight sum value over criteria value

$$\lambda\ max=\frac{\sum(w_1+w_2+w_3\cdots w_n)}{n} \quad (4)$$

Next, take the value of lambda max and calculate for consistency index with the Eq. (5):

$$CI=\frac{(\lambda max-n)}{(n-1)} \quad (5)$$

Using the Eq. (6), the consistency test is calculated to verify the consistency and validity of pair-wise comparison:

$$CR=\frac{CI}{RI} \quad (6)$$

where CR represents the Consistency Ratio, CI is Consistency Index, and RI is Random Index. Consistency is acceptable when the value is 0<CR<0.1.

Step 4: Eq. (7) – (8) below is determined the geometric mean of the Fuzzy comparison values for each factor.

$$S_i = \left(\prod_{j=1}^{n} dij\right)^{\frac{1}{n}}, \quad (7)$$
$$= [(l_{i1}, m_{i1}, u_{i1}) \times (l_{i2}, m_{i2}, u_{i2}) \cdots (l_{in}, m_{in}, u_{in})], \quad (8)$$
$$= (l_{Si}, m_{Si}, u_{Si}).$$

where Si represents geometric mean and denotes Fuzzy triangular values, $\prod_{j=1}^{n} dij$ is multiplied by every Fuzzy value from the pair-wise comparison matrix.

Step 5: Eq. (9) the value of the vector summation is calculated based on the geometric mean for each factor.

$$Vector\ summation = \sum Si = \sum (l_{Si}, m_{Si}, u_{Si}) \quad (9)$$

Step 6: The inverse power of vector summation (t^{-1}) is calculated using Eq. (10). The Fuzzy triangular number of vector summation is created in ascending order (q).

$$t^{-1} = \sum \left(\frac{1}{l_{Si}}, \frac{1}{m_{Si}}, \frac{1}{u_{Si}}\right) \quad (10)$$

Step 7: By multiplying the geometric mean (S_i) with the inverse vector's ascending order (q), the Fuzzy weight of the factor (W_i) is calculated. In this step, the Eq. (11) below is used.

$$W_i = S_i \times q,$$
$$= (l_{Wi}, m_{Wi}, u_{Wi}). \quad (11)$$

Step 8: The Center of Area method, as shown in the Eq. (12), is defuzzied because Fuzzy triangular numbers still display the Fuzzy weight of the factor.

$$R_i = \frac{(l_{Wi}, m_{Wi}, u_{Wi})}{n} \quad (12)$$

where R_i represents a non-Fuzzy number.

Step 9: The weight is normalized using the Eq. (13) because non-Fuzzy weight is not normalized:

$$Z_i = \frac{R_i}{\sum_{i=1}^{n} Ri} \quad (13)$$

where Z_i represents the final weight after normalization.

Step 10: Since every step is calculated, the factors are ranked based on the final weight after normalization. The Perlis community chooses Halal products based on the highest normalized weight, which is deemed to be a significant influencing factor.

Step 11: The steps from Step 1 through Step 10 are repeats for each sub-factor (sub-criteria) that influences the Perlis community's decision to select the Halal product.

Findings and Discussions

The Fuzzy AHP approach was used to normalize the weightage for the factors influencing the Perlis community's decision to choose Halal products. According to the weightage that has normalized in Table 3, product awareness has the highest weight, with a value of 0.4559. Therefore, product awareness is the best factor influencing the Perlis community's decision to choose Halal products. The weightage for the products' price, quality, and ingredients are 0.3340, 0.1464, and 0.0636, respectively.

Table 3
The Value of Non-Fuzzy Weight and Normalized Weightage of each Factor

Factors	Non-Fuzzy Weight, Ri	Normalized, Zi
Product Quality	0.1489	0.1464
Product Ingredients	0.0647	0.0636
Product Awareness	0.4636	0.4559
Product Price	0.3397	0.3340

The weightage for the sub-factors influencing the decision to choose Halal items is shown in Table 4 below. Religious obligation, which has the highest weight of 0.5101, is the best sub-factor that has an impact on the product awareness factor. Then followed the awareness of various aspects and the JAKIM-certified Halal logo, which had weighted values of 0.4301 and 0.0598. Table 5 shows the best sub-factor influencing the product price factor, with a maximum weight of 0.1958, which is choosing price over taste. Following that, with weights of 0.1958 and 0.0978, the displayed price is followed by the reasonable price in relation to income. Table 6 shows that the best sub-factor that impacts the product quality factor is not harmful and has the highest weight (0.4308). Good Manufacturing Practices and safety and hygiene come next, with weights of 0.3806 and 0.1885. Table 7 illustrates that the best sub-factor that influences the product ingredients factor, with a weight of 0.3724, is material that is not declared illegal by Islamic law. Free from non-Halal animals and ingredient labels on products with weights of 0.3329 and 0.2947 follow next

Table 4
The Value of Non-Fuzzy Weight and Normalized Weightage for each sub-factor of Product Awareness

	Non-Fuzzy Weight, Ri	Normalized, Zi
Religious responsibility	0.3888	0.5101
Aware of the various aspect	0.3278	0.4301
Halal logo certified by JAKIM	0.0456	0.0598

Table 5
The Value of Non-Fuzzy Weight and Normalized Weightage for each sub-factor of Product Price

	Non-Fuzzy Weight, Ri	Normalized, Zi
Viewed Price	0.2017	0.1958
Choose price rather than taste	0.7279	0.7064
Reasonable price based on income	0.1008	0.0978

Table 6
The Value of Non-Fuzzy Weight and Normalized Weightage for each sub-factor of Product Quality

	Non-Fuzzy Weight, Ri	Normalized, Zi
Safety and Hygienic	0.1916	0.1885
Not harmful	0.4378	0.4308
Good Manufacturing Process	0.3868	0.3806

Table 7
The Value of Non-Fuzzy Weight and Normalized Weightage for each sub-factor of Product Ingredients

	Non-Fuzzy Weight, Ri	Normalized, Zi
Free from the non-Halal animal	0.3421	0.3329
Material used not declared illegal by Islamic Law	0.3831	0.3724
Ingredients labelling	0.3031	0.2947

The ranking of factors influencing the Perlis community's decision to select Halal products is depicted in Table 8. The normalized weight with the highest value determines the ranking. Product awareness is ranked first. The second-highest ranking factor is product price, while product quality is third. Product ingredients come in at the fourth rank, which is the lowest rank.

Product awareness is the best factor and religious responsibility is the best sub-factor that influences the selection of Halal products among the Perlis community. All of the goals were achieved in light of the above results. Due to their obligation to uphold religious principles, the Perlis community choose Halal products in accordance with product awareness. Additionally, they gave product ingredients less consideration because they chose a product based on whether it was made without the use of non-Halal animals.

Table 8
Ranking of the factors and sub-factors

Factors	Rank	Sub-Factors	Rank
Product Awareness	1	**Religious responsibility**	**1**
		Aware of the various aspect	2
		Halal logo certified by JAKIM	3
Product Price	2	**Choose price rather than taste**	**1**
		Viewed Price	2
		Reasonable price based on income	3
Product Quality	3	**Not harmful**	**1**
		Good Manufacturing Process	2
		Safety and Hygienic	3
Product Ingredients	4	**Material used not declared illegal by Islamic law**	**1**
		Free from the non-Halal animal	2
		Ingredients labelling	3

Conclusion and Recommendations

Using the Fuzzy-AHP approach, this study attempts to identify and rank the best factors and subfactors impacting the selection of Halal products in Perlis. Product quality, product ingredients, product awareness, and product price were the factors that were specifically chosen for this study. The data was obtained from three experts who work as Halal officers for the Jabatan Agama Islam Perlis.

The purpose of this study was to identify and rank the significant factor and sub-factors that influence the selection of Halal products in Perlis. The Fuzzy AHP approach, which combines the Fuzzy theory with AHP, has been used and has successfully achieved these goals. Based on the data from the Fuzzy AHP model, this study concludes that product awareness is the first rank, followed by product pricing in second rank, product quality in third rank, and product ingredients, is the fourth rank. This result clearly related with research by Sidek et al. (2022) found all the four factors showed that consumer purchase behaviour for halal products is directly significant and positively correlated. When all the four factors are significant and positively correlated, hence the study using Fuzzy AHP approach was employed to investigate the rank of factor and sub-factors that influence the selection of Halal products in Perlis.

For the subfactor under the factor of product awareness, responsibility toward religion is crucial which ranked first followed by aware of the various aspect and Halal logo certified by JAKIM. This result fitted with Sidek et al (2022) that stated, according to Islamic teaching, all Muslims in the nation consume halal products as one of the religious obligations. Additionally, sub-factor for the issue of product price ranked first is choosing price over taste followed by viewed price and reasonable price based on income. The most crucial sub-factor for the product quality factor is that it must not be harmful, Good Manufacturing Process, and safety and hygienic. The most crucial sub-factor for the product ingredient factor which ranked first is that it must not contain any materials prohibited by Islamic law followed with free from the non-Halal animal and ingredients labelling.

Referring to the normalised weight values from the outcome, the ranking of the elements may be determined. Product awareness, which has a normalised weight of 0.4559, is ranked top among the factors that affect the community of Perlis' selection of Halal products, and religious responsibility, which is a sub-factor of product awareness, has the highest normalised weight of 0.5101. Ingredients utilised in products have a normalised weight of 0.0636, the lowest rank, and a normalised weight of 0.3724 for its subfactor, which is materials used that have not been prohibited by Islamic law. Therefore, product awareness is the best factor and religious responsibility is the best sub-factor that influences the selection of Halal products among the Perlis community.

The factors that influenced the selection of Halal products by the Perlis community can be studied in more detail using a different suitable method for multi-criteria decision-making. For example, Fuzzy TOPSIS (Technique for Order Preference Similarity to Ideal Solution) and Fuzzy PROMETHEE (Preference Ranking Organization Method for Enrichment Evaluation) are other appropriate statistical approaches using Multiple Linear Regression (MLR) and Correlation Analysis.

However, implementing various techniques might result in slightly different consequences. Likewise, new factors and sub-variables, such as product marketing, product processing, product perception, and product consumption, can be implemented for future research. The new criteria will offer more data and insight into the investigation. Additionally, this study can consult local authorities like JAKIM to acquire their perspectives on the Malaysian community

References

Alzeer, J., Rieder, U., & Hadeed, K. A. (2018). Rational and practical aspects of Halal and Tayyib in the context of food safety. In *Trends in Food Science and Technology* (Vol. 71). https://doi.org/10.1016/j.tifs.2017.10.020

Ambali, A. R., & Bakar, A. N. (2014). People's awareness on halal foods and products: potential issues for policy-makers. *Procedia - Social and Behavioral Sciences*, *121*. https://doi.org/10.1016/j.sbspro.2014.01.1104

Aransyah, M. F., Furqoniah, F., & Abdullah, A. H. (2019). The review study of halal products and its impact on non-muslims purchase intention. *IKONOMIKA*, *4*(2). https://doi.org/10.24042/febi.v4i2.5355

Ariffin, M., Syahadah, N., Riza, M., Hamid, F., Awae, F., & Nasir, B. (2021). Halal food crime in malaysia: an analysis on illegal meat cartel issues. *Journal of Contemporary Issues in Business and Government*, *27*(02). https://doi.org/10.47750/cibg.2021.27.02.152

Aruldoss, M. (2013). A survey on multi criteria decision making methods and its applications. *American Journal of Information Systems*, *1*(1), 31–43. http://pubs.sciepub.com/ajis/1/1/5/

Azam, A. (2016). An empirical study on non-Muslim's packaged halal food manufacturers: Saudi Arabian consumers' purchase intention. *Journal of Islamic Marketing*, *7*(4). https://doi.org/10.1108/JIMA-12-2014-0084

Aziz, Y. A., & Chok, N. V. (2013). The role of halal awareness, halal certification, and marketing components in determining halal purchase intention among non-muslims in Malaysia: A structural equation modeling approach. *Journal of International Food and Agribusiness Marketing*, *25*(1). https://doi.org/10.1080/08974438.2013.723997

Bhatt, N., Guru, S., Thanki, S., & Sood, G. (2021). Analysing the factors affecting the selection of ERP package: a fuzzy AHP approach. *Information Systems and E-Business Management*, *19*(2), 641–682. https://doi.org/10.1007/s10257-021-00521-8

Chang, A. Y. P. (2017). A study on the effects of sales promotion on consumer involvement and purchase intention in tourism industry. *Eurasia Journal of Mathematics, Science and Technology Education*, *13*(12). https://doi.org/10.12973/ejmste/77903

Findawati, Y., Qomariyah, N., Fitroni, A. S., & Abdullah, D. (2018). Decision support system for Islamic couple selection using fuzzy-AHP and WSM method based web. *MATEC Web of Conferences*, *197*. https://doi.org/10.1051/matecconf/201819715009

Haque, A., Chowdhury, N. A., Yasmin, F., & Tarofder, A. K. (2019). Muslim consumers' purchase behavior towards shariah compliant hotels in Malaysia. *Vidyodaya Journal of Management*, *5*(1). https://doi.org/10.31357/vjm.v5i1.3918

Khan, S., Khan, M. I., Haleem, A., & Jami, A. R. (2022). Prioritising the risks in halal food supply chain: an MCDM approach. *Journal of Islamic Marketing*, *13*(1), 45–65. https://doi.org/10.1108/JIMA-10-2018-0206

Li, W., Yu, S., Pei, H., Zhao, C., & Tian, B. (2017). A hybrid approach based on fuzzy AHP and 2-tuple fuzzy linguistic method for evaluation in-flight service quality. *Journal of Air Transport Management*, *60*, 49–64. https://doi.org/10.1016/j.jairtraman.2017.01.006

Suki, M. N., & Salleh, A. A. S. (2016). Does halal image strengthen consumer intention to patronize halal stores?: Some insights from Malaysia. *Journal of Islamic Marketing*, *7*(1). https://doi.org/10.1108/JIMA-12-2014-0079

Othman, B., Shaarani, M. S., Bahron, A., & Nawi, M. N. H. (2019). The influence of halal practices on organizational performance among food industries (SMEs) in Malaysia. *Halal Journal*, *3*.

Shaari, H., Ahmad, N., Md. Salleh, S., Mokhtar, M. S. S., Yusoff, R. Z., Khamwon, A., & Putatchote, N. (2020). Does halal product availability and accessibility enhanced halal awareness and intention to purchase halal packaged food products: Malaysia and Thailand's halal industry perspective. *International Journal of Supply Chain Management*, *9*(1).

Shaari, H., Ahmad, N., Sanuri, S., Mokhtar, M., Yusoff, R. Z., Khamwon, A., Putatchote, N., & Mokhtar, M. (2019). Consumer purchase intention on halal packaged food products : does halal logo and ingredients matter? *Islamic, Social, Economics and Development (JISED)*, *4*(23).

Sidek, S., Hsbolah, H., Dauh, R. R. R., Abdullah, F. A., Hasnan, N. Ai., & Abdullah, F. A. (2022). the nexus of consumer purchasing behaviour towards halal products among the Malaysian Community. *International Journal of Accounting, Finance and Business*, *7*(43), 535–545. https://www.researchgate.net/publication/364816796

Syazwan, M., Soberi, F., & Ahmad, R. (2016). *Application of fuzzy AHP for setup reduction in manufacturing industry lean and fit manufacturing tools application-case study and industrial problem solving view project Integrating Single Minute Exchange of Dies (SMED) with Fuzzy Analytic Hierarchy Process (F-AHP) View project*. https://www.researchgate.net/publication/318110021

T., M. L., V., P. V., & A., M. (2015). Identification of a better laptop with conflicting criteria using TOPSIS. *International Journal of Information Engineering and Electronic Business*, *7*(6), 28–36. https://doi.org/10.5815/ijieeb.2015.06.05

Wang, H., & Xiong, L. (2022). Understanding the antecedents of mobile social media acceptance during the public health crisis maintenance stage. *International Journal of Disaster Risk Reduction*, *74*. https://doi.org/10.1016/j.ijdrr.2022.102925