Factors Affecting the Successful Implementation of MS1500 by Malaysian Halal Food Industry

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ABSTRACT

Since no specific Halal Act has been established and applied by Malaysian Government yet, up to this day Malaysian Standard, MS1500 is the only basic reference to issue a Halal Certificate for Halal Food which should applied by the legal authority such as JAKIM (Jabatan Kemajuan Islam Malaysia) and State Islamic religious council. Therefore, Malaysian Government is eager to see the successful implementation this MS as their leading Halal Standard. However, there are many problems and challenges that frequently lead to unsuccessful execution of implementation of this MS. Accordingly, this study aims to identify the factors affecting the successful implementation of MS1500 thoroughly. A series of analysis had been performed: started with data preparation and screening followed by Exploratory Factor Analysis (EFA) and reliability test. The next steps of analysis are Confirmatory Factor Analysis (CFA) and Validity Test. This study identified that Perception On Implementation (POI), Halal Control System Activity (HCSA) and Owner, Management, Employee Limitation (OMEL) are the factors affecting the successful of Implementation of MS1500. On top of that, it was also found that in Malaysia, finance and regulation were not the factors that cause the limitation on implementation of Halal Food Standard.

1. Introduction

As one of the specific areas for Malaysia strategies and policies, Halal Industry was completely described in their Halal Industry Master Plan (HIMP). In this HIMP, Malaysian Government had clearly stated that they want to make Malaysia as the Global Reference Centre for Halal Integrity and as the Global Leader in the innovation, production and trade of several halal-related sectors. On top of that, Malaysian Government also want to be the benchmark for Halal Certification matter. Therefore, in year 2000 Malaysian Government have introduced a Halal Food Standard, namely MS1500. However, MS 1500 has been revised three times. The first revision was on 2004, the second revision was on 2009 and the latest revision was on the first quarter of 2019. However, up to now MS 1500:2009 is still the most popular Halal MS as it has been widely and thoroughly applied for one whole decade.

The implementation of MS 1500 is expected to be able to promote Malaysian Halal Food Product in the global arena as well as increase the income of the country. Since no specific Halal Act has been established and applied by the Malaysian Government yet, up to this day MS1500 is the only

basic reference to issue a Halal Certificate for Halal Food which should applied by the legal authority such as JAKIM (Jabatan Kemajuan Islam Malaysia) and the State Islamic Religious Council. MS1500 is added compliance with Good Manufacturing Practices (GMP) and Good Hygiene Practices (GHP). To emphasize the importance of MS1500, the third Revision (2014) of The Manual Procedure for Malaysia Halal Certification stated that food products which already got Halal Certificate should put not only Malaysia Halal Logo but also the Malaysian Standard MS1500 logo and the file reference number (the last 10 digits) in their packaging.

According to [1], with very few exceptions, Implementation of Standard is voluntary basis. It is up to the individual or company to decide whether they want to adopt the standard or not. In line with that, [2] mentioned that a standard could become mandatory or voluntarily used. A standard can be selected as mandatory when it has a direct effect on consumer safety, environmental impact and/or poses health issues, so a regulatory agency enforces its use through the relevant Act and Regulations.

Even though the implementation of MS1500 is on voluntary basis, this MS has been a benchmark of International Halal Standard which is recognized by the United Nations [3]. It is because MS1500 is a guarantee for a quality halal food since the concept and requirements stipulated are comprehensive and covers the whole food production process [4]. Moreover, the implementation of MS1500 before getting Halal Certificate and Halal Logo is expected to solve the doubt of Muslim consumers when they bought the food and could act as a quality assurance in food and beverages for non-Muslim consumers [5].

Nowadays, Malaysia is seen as the world's most successful country in promoting Halal food industries. Malaysia has implementing a single halal food standard throughout the country. Therefore, Malaysian Government is eager to see the successful implementation of their halal standard, especially MS1500 as their leading product. However, it can be concluded that the success and integrity of the Malaysian Halal Food Standard MS1500 ultimately depends on the extent of implementation by these food production companies. Both domestically and internationally, all parties involved need to implement the guidelines and requirements completely to attain the desired success.

There are many problems and challenges that frequently lead to unsuccessful execution of implementation of MS1500. The difficulty of implementation of MS1500 mostly faced by the food SMEs [6]. This situation mostly associated with high costs [7,8], limited resources regarding standard [9] and lack of awareness about Halal Certification process and its requirement [10] Many SMEs still believe that the implementation of a voluntary standard will only incur extra cost which is called as compliance cost [7] In addition to that, there are currently still Food and Beverages SMEs owned by indigenous Muslims in Malaysia, whom all this time simply claim that their products are Halal without actually ever signing up for the official Halal Certificate and implementing Halal Standard.

From the reviewed of the literature, it is found that there is a large body of literature which has talked and discussed about the roles and impacts of Halal Certificate and Halal Logo in Malaysia [10-24]. Conversely, only a few empirical studies or publication talked about the roles and impact of Halal Standard, especially about the Implementation of MS 1500. Another finding from the literature review is the fact that most of the study about halal food certification and halal logo paid more particular attention on consumer side but lesser attention on the manufacturer or industry-side [13, 25-26]. Accordingly, for the future research, it is suggested the researchers to give more attention on industry or manufacture side [27-28].

This study is expected to bridge the theoretical gap and uneven scope in halal food standard research with particular attention on industry side. Based on the background presented above, this study was performed to know about the factors affecting the successful of implementation of MS1500 by halal food industry in Malaysia holistically. To achieve this objective, a more in depth understanding of standard and its implementation is required.

Implementation is a long process not an event. Implementation can take place at different levels: the practitioner, the agency, or the community. A good implementation research should be able to provide lessons to practitioners about the best way to run effective programs and advice to policymakers about how to improve existing interventions.

To elaborate the factors affecting the successful of implementation of MS1500, this study has followed and modified the findings of [29]. In their study, it was mentioned that there are four important aspect in an implementation research: perception of the respondent about the context of implementation, the process (the core activities) of the implementation itself and the limitation or barrier on implementation and the outcomes, or end-products of the implementation. However, this study focused on the first three aspects only. This is because the outcomes or end-products of the implementation, is considered to be an impact instead of an aspect of implementation.

For the process (core activities) of the implementation itself, the elaboration referred to the findings of [30] which has classified the core activities in an implementation into six core activities, namely: (1) Staff selection; (2) Pre-service and in-service training; (3) Ongoing consultation and coaching; (4) Staff and program evaluation; (5) Facilitative administrative support; and (6) Systems interventions. Core implementation components complement one another. A weakness in one component can be overcome by strengths in other components. Moreover, regarding the limitation or barrier in an implementation, it was concluded that the desirable outcomes of an implementation are achieved only when all the barrier can be solved [30]. It is because they found that many programs settle for paper implementation only and have no effect nor create actual changes in practice that produce effects benefiting the intended audience.

After performing a series of analysis, result of this study is expected to be useful for Malaysian government or Halal related agencies, so they will be able to find the best solutions to minimise the limitations on implementation of MS1500. Moreover, it is also expected that they can promote this MS, either local or international. Thus, the implementation rate of this MS can be increase significantly.

2. Materials and Methods

The positivist research paradigm & philosophy was chosen to be used in this study with a cross sectional design where the detailed of it presented in the form of Logical Framework Approach. The nature of investigation on this study is an after only experimental study. The method in performing this study is quantitative method with a purposive sampling with a criterion strategy. Meanwhile the data time frame for this research is between early of 2010 until September 2019.

The primary data was collected by using a structured questionnaire which is delivered and collected directly by the researcher. Moreover, since MS1500 is a basic reference using by JAKIM in issuing Halal Certificate, it is assumed that all the companies in the Halal Food industry already got Halal Certificates and by default have implemented this MS automatically. Accordingly, the scope of population for this study covers the "Food and Beverages Industry in Malaysia which already got Halal Certificate and Halal Logo".

As of 25th August 2018, it is found that there were 5,338 Food and Beverages companies that already have Halal Certificate. Among the 5,338 companies, data from 212 companies were collected. This sample size is slightly above the minimum sample requirement (205) which was justified in a previous study [31]. The companies that participated in the survey were companies which took part in halal exhibition or food festivals. Meanwhile the criteria of survey participants is the ones who currently employed and involved with service delivery at the Halal Food Industry, such as Halal Executive, Halal Manager, and Head-of-Production Department, Owner, Sales and Marketing, Quality Assurance, etc.

Data analysis was started with data preparation and screening which is focussed on the issue of missing data, outliers and normality. The next step are Exploratory Factor Analysis (EFA) and reliability test. Both of these analyses are performed by using SPSS23 software. EFA is performed

to discover the number of factors influencing variables and to analyse which variables 'go together' [32].

By performing EFA, a huge cluster of indicators or observed variable is expected to break down into certain sets that are divided and eventually represented by certain variables [33]. If something want to be labelled as a factor it should have at least 3 variables [34]. These variables may correlate with each other to produce a factor despite having little underlying meaning for the factor. Before proceed with the EFA, it is important to determine whether the collected dataset is suitable or not. Thus, it is important to previously check these indicators values: (1) Bartlett's Test of Sphericity (significant level of $p < .05$); (2) Kaiser-Meyer Olkin (KMO) of Sampling Adequacy (this value should be bigger than 0.5); and (3) Anti Image Correlation (this value should be above 0.5). All of these indicators are commonly acknowledged as MSA (Measures of Sampling Adequacy). For the EFA itself, it was mentioned that there are three important values which need to be fully considered in EFA: Eigen Value (EV), Communalities Extraction Value (CEV) and Component Matrix Value (CMV) [35]. Moreover, if there is only one component being extracted, there will be only one factor formed. Consequently, there will be no need to do the rotation. On the other hand, if there are 2 factors formed, there is a need to do rotation with the Varimax and Kaiser Normalization where the rotation converged in 3 iterations.

Reliability test was performed after the EFA completed. Reliability test is important to do in order to maintain the internal consistency [36]. There are several methods for estimating reliability. However, the most popular coefficient for internal consistency is Cronbach's α, especially for a set of questionnaires (or survey) that comprises of multiple Likert-type scales [37-38]. Moreover, it was explained that, Cronbach's α value should range from 0 to 1 [38]. Cronbach's α of 0.70 and above is good; 0.80 and above is better; and 0.90 and above is best. Meanwhile, the Cronbach's α that are less than 0.5 are usually unacceptable.

The next step of analysis series was performed by using AMOS23 software and it consist of Confirmatory Factor Analysis (CFA) followed by Validity Test. CFA is applied to test whether the collected data fit a hypothesized measurement model which has designed based on selected theory [39]. Moreover, validity test was proceeded before the structural model analysis, in order to assure the convergent validity and discriminant validity have also achieved. The series of test which are need to do in validity test are: Composite Reliability (CR), Average Variance Explained (AVE), Maximum shared Squared Variance (MSV) and Average shared Squared Variance (ASV). As suggested by [33]. CR must be greater than AVE and AVE must be greater than 0.5. Meanwhile to reach a good discriminant validity, MSV and ASV must be lower than AVE.Another emerging technology in the oil industry is the aqueous extraction process (AEP). AEP is a technique in which water is used as a means of extraction and separation of oil based on its insolubility in water medium [7]. Following the dissolution of soluble cellular materials, free oils are expelled into the liquid and then centrifuged and demulsified to recover free oil [8].

3. Results and Discussion

3.1. Data Preparation and Screening

A small mistake in data entry process may end up in huge consequences in the analysis process [40]. Therefore, data preparation and screening are important to do before proceeding with the data analysis. In data preparation and screening, there are three aspects which needs to be handled carefully: missing data, outliers and normality.

From 225 distributed questionnaires, there were only 215 questionnaires return where three (3) of it are incomplete (has more than 25% missing data). Therefore, there only 212 completed questionnaires were ready to use for data analysis. The remaining usable questionnaires checked by SPSS 23 and it is found that there was no missing value. Accordingly, it can be concluded that the respondent indicated a high level of cooperation and accuracy.

Moreover, the calculation of skewness and kurtosis value showed that all skewness values are below 3 and all kurtosis values are below 10. Those values indicated that there are no univariate outliers detected or identified. For multivariate outliers' identification, Mahalanobis D2 analysis result indicated that there were no multivariate outliers with higher D2 distance and a p-value less than 0.001. In other word, it is concluded that there were no potential univariate or multivariate outliers detected from the data set in this research.

In the meantime, it has decided not to do the normality test because according to [41], it is no need to do a normality test because a Likert scale can never generate normally distributed data. Therefore, based on all the result of the data preparation and screening it can be concluded that all the data analysis is ready to proceed.

3.2. Exploratory Factor Analysis

It had been mentioned that EFA is performed to discover the number of factors influencing variables and to analyse which variables 'go together' [32]. Therefore, from EFA we will know about the amount of factor can be extracted or formed from several observed variable or construct in our questionnaire. In this study, there are 3 predefined factors of implementation and it consisted of: (1) Implementation A (Perception on Implementation); (2) Implementation B (Core Activities in Implementation); (3) Implementation C (Limitation of Implementation).

The naming of predefined factors is conducted based on the chosen pertinent theory. Up to now, there has yet to be a standardised theory for the implementation of a standard. Thus, the questionnaire of this research was designed based on several different studies regarding the implementation of standard [19, 30]. Accordingly, the EFA was conducted in this study, to check whether the predefined factor was correct and suitable to use as a factor or not.

Before proceeding with the EFA, the MSA (Measures of Sampling Adequacy) indicators had checked previously. These indicators consisted of Bartlett's Test of Sphericity, KMO test and Anti Image Correlation test. With $p<0.001$, Bartlett's Test of Sphericity was found to be significant. It is also found that the value of KMO for all 12 factors was above 0.7 and all the value of Anti Image correlation was above 0.5. These values indicated that the collected data sampling set is adequate enough to proceed with the EFA. It has been chosen to employ the Principal Component Analysis (PCA) method to extract the data and Varimax Rotation method to rotate the factor matrix, so it can approach simple structure in order to improve the data interpretability. The summary of initial EFA on this study can be seen on Table 1.

Table 1. EFA Summary on Implementation of MS1500

Pre-Defined Factor	Number of Variable	KMO	Communalities Extraction	Eigen-values (EV) > 1	Number of Factor Formed	Formed Factor	
						Factor-1	Factor-2
Implementation A	7	0.851	>0.5	2	2	POI (Va1-4, 6-7)	TAKE OUT (Va5)
Implementation B	7	0.775	>0.5	2	2	PIA (Va1 to Va4)	HCSA (Va5 to Va7)
Implementation C	7	0.793	>0.5	2	2	OMEL (Va4 to Va7)	FRL (Va1 to Va3)

The result of EFA on Table 1 showcased that there are two factors formed (extracted) from each predefined Implementation factor. These results indicated that all of observed variables on each predefined factor of Implementation can be explained by two different factors. Nevertheless, there is a different approach on one of predefined factor of Implementation namely Perception. Even though there are two formed factors, one of it only has one observed variable, namely POI5 (the holistic and continuously implementation of MS 1500:2009 will incur extra cost). Considering the statement of [34] who mentioned that the minimum requirement for something to be labelled as a

factor is to have at least 3 observed variables, it is decided to take this second factor out. After rerun the EFA with only 6 remaining observed variables, it is found that there is only one factor formed and this formed factor has the same name with the pre-defined factor: "Perception On Implementation" (POI).

From a series of analysis on EFA, it is turned the 3 predefined factors on implementation (Perception, Core Activity and Limitation) into 5 formed factors. Since there was one observed variable had been taken out, there are only 20 observed variables left, compare to 20 in the beginning. The new formed factors are called: Perception of Implementation (POI), Pre-service & In-service Activity (PIA), Halal Control System Activity (HCSA), Owner, Management & Employee Limitation (OMEL) and Finance & Regulation Limitation (FRL). All of these new formed factors have met the minimum requirements of having at least three observed variables. To test the internal consistency of those EFA result, the Cronbach's α test was performed.

3.3. Reliability Test

Reliability test was performed to maintain the internal consistency of the set of questions that has constructed. Cronbach's α has been chosen to test the reliability of the set of questions in this study. The reliability analysis was performed towards 5 formed (extracted) factors from the EFA above. The overall result of reliability test of the extracted factors on this study can be seen on Table 2.

Table 2. Reliability Coefficient of the Formed (Extracted) Factors

Factor Generated	Cronbach's Alpha	No. of Construct
Perception of Implementation (POI)	0.868	6
Pre-service & In-service Activities (PIA)	0.826	4
Halal Control System Activities (HCSA)	0.829	3
Owner, Management or Employee Limitation (OMEL)	0.828	3
Limitation on Financial & Regulation Factor (FRL)	0.850	4

From Table 2, it is found that all of the Cronbach's α values of this study is above 0.8 (from 0.826 to 0.868). Referring to Nunnaly's Cronbach's α values classification, all those new formed factors can be justified to have a better internal consistency [38]. From this reliability test, it is also found that the removal of one observed variable under POI factor not only increase the KMO value, but also the Cronbach's α value. It has been changed from 0.828 (with 7 observed variables) into 0.868 (with 6 observed variables).

3.4. Confirmatory Factor Analysis (CFA)

The EFA result which have been proved to have a better internal consistency is usable to design the path diagram for CFA. Since there are several formed factors, all of the path diagrams of measurement models are considered as "second order measurement model". Consequently, in performing CFA each model started with the first order-initial model, followed by first order-final model and second order –initial model, and ended with the second order-final model, as can be seen on the Figure 1.

The generated (formed) factor 'Finance & Regulation Limitation (FRL)' was removed because the factor loading of this factor was lower than the minimum criteria (0.44< 0.5). With the removal of the FRL; the four observed variables under FRL were consequently removed too. The low factor loading of FRL indicated that it has the lowest correlation with implementation compare to other formed factor. This result is in contrast with several previous studies that have noticed that financial constraints was the most limitation factor in food safety certification [42-45]. It is also contradicting with previous studies which mentioned that financial issue remains a persistent barrier in implementing Halal food certification, especially for small-sized food companies [19, 46]. This results also differs from previous studies which found that barrier from the certification regulatory bodies could lead to inefficient execution of implementation of a standard [19, 44, 47].

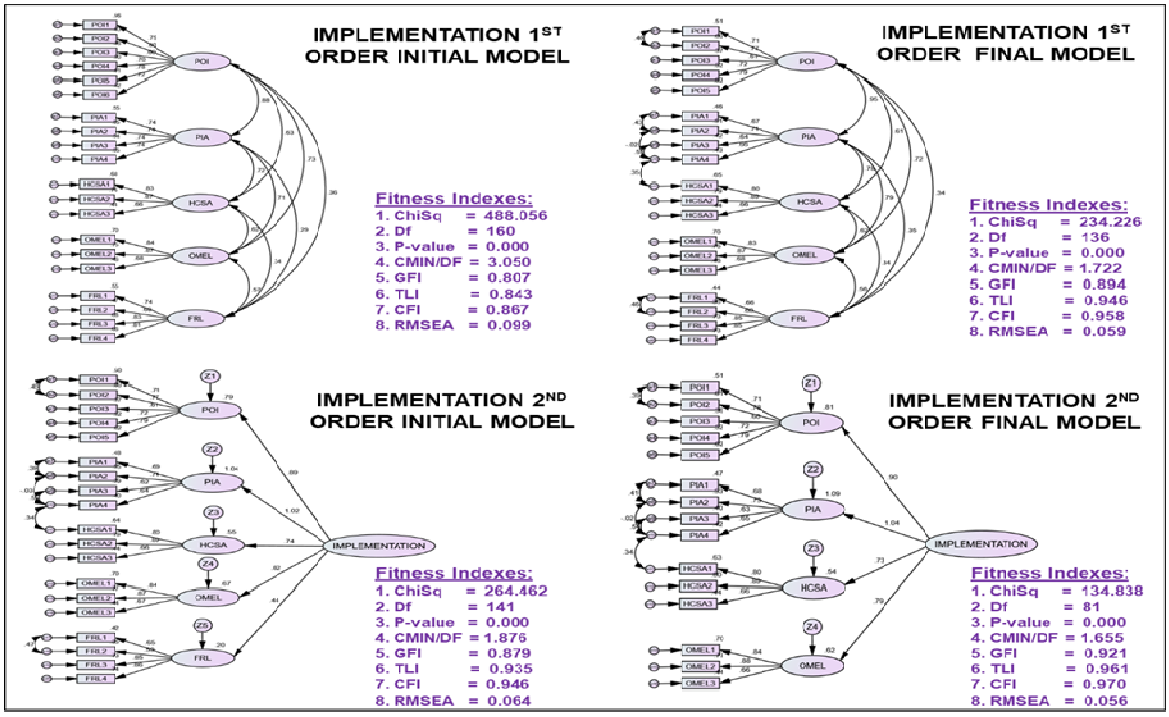

Fig 1. Confirmatory Factor Analysis (CFA) for Implementation of MS1500

The reasonable explanation for these contradictory results is that most of the research respondents were Halal executives (25.94%) and owner (23.58%) who represented their companies in Halal exhibitions. Therefore, they believe that halal certification and halal food standard is important. In turn, financial and regulation are not major issues for these respondents. Additionally, it was found from the conversations with several respondents that there is a common belief among them that financial and regulation issues regarding halal food certification and halal food standard can be overcome by high commitment of owner, management, and employees. It is in accordance with a previous study who argued that the high commitment of management and employee will hinder any barrier in implementation of halal certificate [19].

Additionally, the observed variable POI6 (The implementation of MS 1500:2009 is not only for fulfilling JAKIM Halal Certificate requirements but also as a Company's Moral Responsibility) was also deleted. Therefore, on the final stage of this CFA, the total number of deleted observed variable were 5 and there only 15 observed variables (construct) left. The reason for this deletion is because its Standardised Residual Covariance (SRC) value was lower than 2.58. The summary of CFA process can be found on Table 3.

Table 3. The Summary of CFA Process

Main Latent Variable	Initial 1st Order	Final 1st Order	Initial 2nd Order	Final 2nd Order	Remark
Implementation	5 SLV 20 OV	5 SLV 19 OV	5 SLV 19OV	4 SLV 15 OV	Delete 1 SLV and 5 OV + Covariance of several correlated error

SLV : Sub Latent Variable

OV : Observed Variable

3.5. Validity Test

The model fit of CFA does not guarantee the convergent and the discriminant validity have automatically achieved. Thus, it is important to do the validity test. The summary of the validity test before and after re-examined can be found on Table 4.

Table 4. The Summary of Validity Test towards the Factors of Implementation of MS1500

Sub-Latent Variable	Validity Test Based on CFA Result				Re-examined Validity Test Result			
	CR	AVE	MSV	ASV	CR	AVE	MSV	ASV
POI	0.844	0.522	**0.903**	0.48	0.865	0.562	0.516	0.34
PIA	0.729	**0.454**	**0.903**	**0.565**				
HCSA	0.831	0.624	0.612	0.372	0.837	0.634	0.396	0.29
OMEL	0.839	0.638	0.626	0.462	0.84	0.639	0.516	0.401

Composite Reliability (CR), Average Variance Explained (AVE)
Maximum shared Squared Variance (MSV) and Average shared Squared Variance (ASV).

From Table 4, it is found that there are some issues of collinearity which is need to solve by conducting some important modification on the problematic indicators, either in the form of removal or aggregation of the observed variable. The possibility of this modification had been warned by [48]. After some modifications performed and the validity test re-examined, it is seen the formed factor PIA had been removed from the list. This deletion was performed because the correlation value between POI and PIA is too high (0.95). Therefore, there was a need to perform the latent variable aggregation. Three over four observed variables on PIA (PIA1, PIA2, and PIA4) are collected together with POI, while PIA3 is put along with HCSA.

As a result, there only the 3 remaining formed factors of Implementation of MS1500 left, namely: Perception on Implementation (POI), Halal Control System Activity (HCSA) and Owner, Management & Employee Limitation (OMEL). This result is in accordance with the results presented by [29], whereby each remaining sub-latent variable perfectly represents one of the three important aspects in an implementation research. Specifically, POI represents the perception of the respondent about the context of implementation, HCSA represents the process of the implementation itself and lastly OMEL represents the limitation or barrier on implementation.

4. Conclusion and Recomendation

After performing a series of analysis, this study has identified three (3) factors affecting the successful of Implementation of MS1500 by Halal Food Industry in Malaysia. These factors are called as: (1) Perception of Implementation (POI); (2) Halal Control System Activity (HCSA); and (3) Owner, Management & Employee Limitation (OMEL). In other word, it can be concluded that the successful implementation of MS 1500 is affected by the perception (whether it is positive or negative perception) of the industry towards this MS; the extent (full implementation or just for window dressing) of the implementation; and how the industry overcomes the barriers which may come from owners, management or employees.

On top of that, it was also found that finance and regulation were not the factors that cause the limitation on implementation of MS1500. This finding is in contrast with several previous studies. The reason for this difference is likely due to the majority of this research's respondents being participants of Food or Halal Exhibitions. Consequently, their opinions could be biased due to a certain interest in stating that all of them are fully aware and eager to implement MS 1500:2009.

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