CHAPTER 4
RESEARCH METHODOLOGY

4.1 Introduction

The aim of this chapter is to provide a detailed overview of the entire research process of the current study with specific focus on the research design and data collection. The research design includes development of the research instrument and determination of the population and sampling approach, while the data collection section explains how the pilot and final surveys were done. The proposed process of data analysis is also presented in this chapter.

This chapter is structured in three major parts. The first part presents the overview of research design and methods. As such, it clarifies the data used, population, sampling size, techniques, and data collection procedures. The second part focuses on the instrumentation, development of the questionnaire, human information seeking metrics of halal food products and pilot study in terms of reliability and validity. The final part reviews systematic and well elaborated means to the data analysis.

4.2 Research Design

Data on attitude, habit, awareness of individual, information sources, process verification, and awareness of information, traceability and wholesomeness were collected using a survey research design with well-structured questionnaire. Survey research design was used over other designs to determine the impacts of the association of human features such as: perception, practice, and consciousness of an individual, with process verification to effectively seek information on halal food. Since it

administers a questionnaire to a sample people to define fields in attitude, opinions and behaviors of a large group of population as Clark and Creswell (2014) stated. Moreover, Creswell (2013) stated that survey research design is appropriate method to study attitudes towards behavior.

On the other hand, Hayes (2000) and Burney (2008) provide explanations about two common approaches to deductive and inductive research. Deduction involves testing hypotheses and analyzing results to determine validity, whereas induction begins with a collection of data and observations that the researcher uses to interpret. The differences between deductive and inductive approaches are shown in table 4.1.

Table 4.1: Differences between deductive and inductive approaches to research

Based On	Deduction	Induction
Logic	In deductive inference, when premises are true, conclusion must also be true.	In inductive inference, known premises generate untested conclusions.
Generalizability	From general to specific	From specific to general.
Use of data	Data collection is used to evaluate propositions and hypotheses related to existing theories.	Data collection is used to explore phenomena, identify themes and patterns, and create conceptual frameworks.
Theory	Theory falsification or verification	Theory generation and building.

Source: Saunders et al. 2012

4.3 Research Methodology Related to This Study

The current research requires generating untested conclusions and analyzing the collected data. Hence incorporating the inductive approach. The inductive approach is considered as moving from a specific study to the general study. This method is more commonly used in qualitative research, where the absence of a theory informing the

research process may be of benefit by reducing the probability for researcher's partiality in the data collection stage.

4.4 Data Collection Procedure

The four types of data that can be collected from a population (Rogerson, 2010) are:

1) Nominal data: Comprises of collectively exhaustive and mutually exclusive data sets obtained from observations that can be assigned to certain pre-determined categories defined as per the research problem and questions.
2) Ordinal data: Ordinal data is categorized as well as ranked.
3) Interval data: Comprises of information on magnitude of distance or difference between any two data points in a data set. It has no true zero value.
4) Ratio data: Comprises of information on magnitude and proportion of distance or difference between any two data points in a data set. It has a true zero value.

Data values may be discrete or continuous (Rogerson, 2010). As further described by Rogerson (2010), a discrete data set comprises a finite set of values, while a continuous set comprises an infinite set of values. The discrete data sets are normally represented as a table of absolute or relative frequencies of the discrete values, whereas a continuous data set is represented as a table of absolute or relative frequencies of class intervals (Rogerson, 2010). In visual forms, data sets may be presented as bar charts, pie charts, and scatter plots, and the frequencies may be presented as histograms, frequency polygon, and stem and leaf plots (Rogerson, 2010). Collecting and presenting the absolute data and the frequency of data units is the first step of any quantitative study (Collis and Hussey, 2009). Such a data set can be described to present its central tendency (mean, median, mode), dispersion (range, variance, and standard

deviation) and special characteristics (skewness, kurtosis, and normal distribution) (Collis and Hussey, 2009).

In this study, the data values were mapped with multiple concepts under study and are discrete. Presenting the descriptive statistics was needed to describe the data within the sample, and also to create a fundamental analysis for the CFA. However, this research was planned to employ inferential statistical modeling, as reviewed below. This is because the research was based on exploring relationships among various variables that have been correlated hypothetically in a theoretical framework. Such correlations cannot be tested satisfactorily using descriptive statistics (Somekh and Lewin, 2005).

Inferential statistics was used to infer the findings of a sample to the entire population with a finite degree of accuracy, applicability and transferability (Collis & Hussey, 2009). It is a science that covers all such techniques that can be used to explore relationships between variables up to extreme depths of analysis. An appropriate inferential technique can be used based on the following attributes of the research design (Barnes and Lewin, 2005):

1) The data type: nominal, ordinal, interval, ratio.
2) The test objectives (testing of relationships or differences).
3) Number of participant groups (two or more).
4) Type of group (independent or related).
5) Nature of test (non-parametric or parametric).
6) Number of variables (univariate or multivariate).
7) Whether multi-component or multi-factor analysis is involved.

The data collection was carried out keeping the inferential statistical design in mind. Somekh and Lewin (2005) described that reliability of results of data analysis

depends upon the quality of data collected. Hence, the data collection procedure (and the design of instrument) was done in accordance with the design elements pertaining to data analysis and reliability and validity testing.

Accordingly, the questionnaire was chosen as the main data collection method for this study because it provides an effective way to collect large amounts of quantitative data from Muslim population in Kuala Lumpur, in a short period of time, which would not be practical to collect through other ways such as in-depth interviews or observations. The advantages of using questionnaires are well documented in many research methodology literatures (Oppenheim, 1992).

Among the advantages are as follows:

1) Facilitates the collection of large amounts of data in a short period of time
2) Allows a wider range and distribution of the sample than the interview method.
3) Provides an opportunity for respondents to give frank, anonymous answers (provided the questionnaires are anonymous).
4) Allows greater economy of effort (i. e., a single instrument, duplicated and distributed to numerous respondents, can produce a large amount of data).
5) Can be constructed so that quantitative data are relatively easy to collect and analyze.
6) Can be designed to gather background information about respondents, as well as original hard-to-obtain data.
7) Allows the collection, in exploratory studies, of insightful information about a relatively unexplored problem area or subject.
8) Can be completed at the leisure of respondents

4.5 Data Collection and its Phases

Survey methods in the form of questionnaires and interviews are the most frequently used methodologies in social science research because they are appropriate methods for collecting original data in order to describe a population too large to observe directly (Babbie, 1986). Moreover, Babbie (1986) and Julien (1996) conducted a content analysis study and found that 44 percent of the research in information use and users were carried out using the survey methods. As such they stated that questionnaire technique has been used extensively because of its convenience and its minimum intervention of the daily lives of respondents.

The data on the research variables: attitude, habit, awareness of individual, information sources, process verification, awareness of information, traceability and wholesomeness were collected using well-structured questionnaire distributed through survey.

This research is organized in three phases namely; expert panel and pilot study, confirmatory factor analysis (CFA), and structural equation modeling (SEM).

4.5.1 Experts and Pilot Study Phase

Experts and pilot study phase focus on instrument preparation by selecting a panel of experts for reviewing the face validity of the survey instruments. Following this, a pilot study of the instrument has conducted on the data sample to determine the adequacy of the survey instrument.

4.5.1.1 Experts' Validation

Face validity, which is a basic form of validity was used to ensure that the indicators appear at the face to be correctly representing the measures of the concepts.

Therefore, the survey was validated by consulting individual's experts that have a finite experience in the field study. Experts reviewed the questionnaire for face value and content validity, clarity and ease of completion. They declared that the questionnaire is good, but there is room for improvement. For example, in part B they suggest asking either halal logo is important as criteria in selecting halal food or not, does he/ she have knowledge on halal food? How depth their knowledge is? As such, I got recommendation to change the title and headings of each part of the questionnaire. Moreover, I got recommendation to omit unsuitable question such as: "when I purchase a food product, I look at its processing method whether it follows Islamic rules (Shariah) or not". Furthermore, I got important note of not stating that the survey is investigating the respondent's behaviors because that might affect their responses. Also, it is recommended not to explicitly state religion as it is implied and obvious. Eventually the research results apply to information seeking on any kind of products (gluten free, sugar free, vegetarian products). Based on the recommendations and comments of expert's necessary corrections were made in the questionnaire. Finally, the survey was reviewed from the following experts:

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4.5.1.2 Pilot Study

It is widely acknowledged that pilot testing of the questionnaire before the actual survey is very crucial to confirm that it is easy to understand and, thus, avoid inconsistencies or misinterpretations**.** The issue of reliability and validity of a survey instrument (questionnaire) was considered and observed carefully in this study.

Reliability means consistency and validity indicates the degree to which an instrument measures what it is supposed to measure (Oppenheim, 1992).

4.5.1.2.1 Reliability

According to Babbie (1986), reliability refers to the likelihood that an instrument would yield the same result each time it applied to the same object. The importance of reliability is related to the strength of the validity measure. When researchers lack evidence of validity, they often turn to reliability techniques to ensure the usability of the instrument. Reliability is estimated using a variety of methods. Lafon (1992) employed Selltiz's (1976) list of differences and variations that may represent a threat to the reliability of the instrument.

4.5.1.2.2 Validity

Validity concerns with whether an instrument accurately measures the variable it is intended to measure. There are several methods of estimating the validity of the instrument, such as content validity and construct validity. Most of these methods are complex and time consuming, and there is no common agreement on whether a particular method is more suitable to the concept's meaning. "The subject of validity is still controversial in social science research" (Babbie, 1986). Content validity, however, is the most popular method used in social science research, regardless of its limitation as being subjective in nature and relying completely on common sense and logic in determining the validity of a survey instrument. "Content validity is also known as face validity, assessing the logical relationship between the variable and the instrument intended to measure it" (Monette, Sullivan, & DeJong, 1994). One way of conducting content validity is the "jury opinion." In this technique, opinions of experts considered

knowledgeable about the variable involved are collected and assessed to determine the validity of the instrument. “The jury opinion method is preferable by many researchers because more people are involved in assessing the validity of the instrument, therefore reducing bias or misinterpretation” (Monette, Sullivan, & DeJong, 1994). Further reproduction prohibited without permission. Good (1963) suggested the following list of questions to provide a guideline for measuring the content validity of a survey questionnaire:

1) Is the question on the subject?
2) Is the question perfectly clear and unambiguous?
3) Does the question pull or have extractive power?
4) Will a large enough proportion of respondents have validity to answer it?
5) Do the responses show a reasonable range of variation?
6) Is the information consistent in agreement with what is expected?
7) Is the item sufficiently inclusive?

4.5.2 Confirmatory Factor Analysis CFA Phase

This phase focus on the validity of the elements integrated from phase one. As suggested by Hoelter (1983) and Bryant and Arnold (1995), the analysis was separated using CFA techniques. CFA is chosen because it has been proven to be ideal for testing the validity of proposed constructs (Umiaspy, 1996; Segars & Grover, 1993) as well as model fit (Ulrich, 2009). Like EFA, the purpose of CFA is to identify latent factors that account for the variation and covariation among a set of indicators. Both EFA and CFA are based on the common factor model (Sekaran & Bougie, 2013).

Unlike EFA, the CFA framework offers the researcher the ability to specify the nature of relationships among the measurement errors (unique variances) of the

indicators. CFA is more parsimonious than EFA because it is uses a smaller number of factors. Although both EFA and CFA differentiate common and unique variances, within EFA the specification of relationships among unique variances is not made. Because CFA typically entails a more parsimonious solution (i.e., CFA usually attempts to reproduce the observed relationships among indicators with fewer parameter estimates than EFA), it is possible to estimate such relationships when this specification is substantively justified, and other identification requirements are met. Consequently, because of EFA's identification restrictions, factor models must be specified under the assumption that measurement error is random. In contrast, correlated measurement error can be modelled in a CFA solution (Lightning et al., 2013).

The analysis of measurement model is the first step before constructing the final structural model. The test of measurement model is achieved through Confirmatory Factor Analysis CFA. The aim of CFA is to verify that each of the independent variable and the dependent variable are fit with its observed variable (items) in a measurement model. The fitness of data with the measure model is essential before building the structural model. The procedures of SEM ensure that the measurement model of each variable is fit with the collected data in the survey. The measurement model consists of latent variable, which maybe first order (include one factor) or second order variable (two or more factors). The steps of testing the measurement variable consist of the following:

1) Constructing the measurement variable for each variable from factors specified in EFA.

2) Verifying the factor loading of indicators (measurement variables). The minimum value of factor loading ≥ 0.3.

3) Verifying the validity of residuals (error terms) and their impact on the overall fitness of the measurement model of each variable.

4) Comparing the Fit-Indices for structural equation modeling (CMIN/DF, RMR, GFI, AGFI, CFI, NF, PCFI, RMSEA, PCLOSE) before and after CFA.

Frequently, CFA is used as a precursor to SEM models that specify structural relationships (e.g., regressions) among the latent variables. SEM models can be broken down into two major components: (1) the measurement model, which specifies the number of factors, how the various indicators are related to the latent factors, and the relationships among indicator errors (i.e., a CFA model); and (2) the structural model, which specifies how the various latent factors are related to one another (e.g., direct, or indirect effects, no relationship, spurious relationship) (Byrne, 2010).

In structural equation modelling, the fit indices establish whether, overall, the model is acceptable. If the model is acceptable, researchers then establish whether specific paths are significant. Acceptable fit indices do not imply the relationships are strong. Indeed, high fit indices are often easier to obtain when the relationships between variables are low rather than high--because the power to detect discrepancies from predictions are amplified.

Many of the fit indices are derived from the chi-square value. Conceptually, the chi-square value, in this context, represents the difference between the observed covariance matrix and the predicted or model covariance matrix.

The fit indices can be classified into several classes. These classes include:

1) Discrepancy functions, such as the chi square test, relative chi square, and RMS

2) Tests that compare the target model with the null model, such as the GFI, CFI, NFI, TFI, and IFI

Many researchers, such as Marsh, Balla, and Hau (1996), recommend that individuals utilize a range of fit indices. Indeed, Jaccard and Wan (1996) recommend using indices from different classes as well& this strategy overcomes the limitations of each index.

A researcher often use A model is regarded as acceptable if:

1) The Normed Fit Index (NFI) exceeds .90 (Byrne, 1994) or .95.
2) The Goodness of Fit Index exceeds .90.
3) The Comparative Fit Index exceeds .93.
4) RMS is less than .08 and ideally less than .05 (Stieger, 1990). Alternatively, the upper confidence interval of the RMS should not exceed .08.

The relative chi-square should be less than 2 or 3. These criteria are merely guidelines. To illustrate, in a field in which previous models generate CFI values of .70 only, a CFI value of .85 represents progress and thus should beacceptable (Kline, 2011).

Each latent variable of the study variables associated with several factors, from the second level to be a standard model, was measured paragraphs link power (measured variables) for each worker based on data collected through a questionnaire and then measured to verify their suitability with the standard model that has been assumed to achieve this, it has been the use of factor analysis affirmative for each variable through the steps of structural equation modelling, taking into consideration that the quality of the model matching largely depends on the sample size and the number of variables in the model (Hair et al., 2010).

As shown in the analysis below, the standard forms may be matched with the data for several reasons, including that the residuals values (standard error) may be negative since loading the value of the global greater than one.

The researchers attributed the existence of negative values of the residuals due to the fluctuation in the sample answers about the rationale for the leftover values in the study population. So, it will be restricted any negative value for residuals and equal to zero or very small positive value and approach to zero.

4.5.3 Structural Equation Modeling SEM Phase

The focus in this phase is on deciding the validity of the model. To analyze the method, SEM techniques were used. SEM attempts to analyze the relationships between independent variables and the corresponding fit of the data to a theoretically derived model (Dow et al., 2008). The next step is interpreting the results according to answers of respondents through a modelling technique. The observed variables are the answers to phrases in the questionnaire. In this section and following subsection, the observed variables are the items of the questionnaire. As found in previous section, the results from EFA shows that each variable consists of specific number of factors, and each factor consists of specific number of observed variables (items), which is called indicators of the factor.

Structural equation models (SEM) with unobservable variables are a dominant research paradigm in the management community today. The establishment of the covariance-based SEM approach can be traced back to the development of the maximum likelihood covariance structure analysis developed by Ghozali (2006) and extended by Sekaran and Bougie (2013).

Structural Equation Modelling (SEM) refers to a diverse set of unrelated computer algorithms and statistical methods that fit networks of constructs to data. SEM includes confirmatory factor analysis, path analysis, and partial least squares path analysis. Using of SEM is commonly justified in the social sciences because of its

ability to assign relationships between unobserved constructs (latent variables) from observable variables (Chumney, 2012).

SEM provides two main advantages in testing a theory (model):

1) Provide numerical estimates for each of the parameters (arrows) in the model to indicate the strength of the relationships.
2) Allows the researcher to diagnose which observed variables are good indicators of the latent variables (through Confirmatory Factor Analysis CFA).

4.6 Population and Sampling Techniques

The population and sampling techniques that were used in the collection of data for this study are discussed in the following subsections.

4.6.1 Population and Sampling Size

The sample size for the questionnaire survey was determined using a formula developed by Krejcie and Morgan (1970), which is called the table for determining sample size from a given population.

This table provides a general scientific guideline for determining a sample size for a given population. It is simple to use and requires no calculation.

Table 4.2: Determining Sample Size for Research Activities, Educational and Psychological Measurement

N	S	N	S	N	S	N	S	N	S
10	10	65	56	140	103	250	152	420	201
15	14	70	59	150	108	260	155	440	205
20	19	75	63	160	113	270	159	460	210
25	24	80	66	170	118	280	162	480	214
30	28	85	70	180	123	290	165	500	217
35	32	90	73	190	127	300	169	…	…
40	36	95	76	200	132	320	175	…	…
45	40	100	80	210	136	340	181	…	…
50	44	110	86	220	140	360	186	50000	381
55	48	120	92	230	144	380	191	75000	382
60	52	130	97	240	148	400	196	1,000,000	384
								2,500,000	384
								10,000,000	384
								100,000,000	384

N: Population size. S: Sample size. Confidence level= 95% with 5% of error estimate.

Source: Krejcie and Morgan 1970

In the current study, the population is (18,000,000) respondents, so the sample size is (384) respondents.

4.6.2 Sampling Techniques

Sampling was carried out using two methods: probabilistic sampling and non-probabilistic sampling (Saunders, Lewis, and Thornhill, 2012). Probabilistic sampling was used in quantitative studies and non-probabilistic sampling was used in qualitative studies. This is because non-probabilistic sampling is not based on probability of a population member being chosen in the sample, and hence statistical inferences to the sample cannot be applied. On the other hand, probabilistic sampling was carried out based on an assumption that each population member may be having a finite probability of being chosen in the sample.

Probabilistic sampling was carried out with an aim to define a suitable sample frame out of the population keeping in mind that the outcomes of the study on the

sample frame have been generalized for the population with a reasonably high degree of reliability and validity (Saunders, Lewis, and Thornhill, 2012). Hence, quality of sampling drives reliability and validity of the study. Sekaran (2010) described the following techniques of probabilistic sampling:

1) Simple random sampling: In this sampling, all population members have equal probability for being chosen in the sample. Hence, a sample software that can choose population members randomly (i.e., not following a pre-determined pattern) can serve the purpose.
2) Complex probability sampling: The population members have a finite probability for being chosen in the sample, but they are unequal. Hence, complex probability theorems are applied to choose members from the population.
3) Systematic sampling: The sampling was carried out in a systematic way by choosing a sample member positioned after a fixed interval in a pattern. Example, every seventh home in a structured residential layout, every fifth student sitting in a classroom, every third member standing in a queue formed based on a pre-determined pattern.
4) Stratified random sampling: This sampling technique is very common in organizational research. The population was divided into strata that are mutually exclusive groups that are exhaustive and relevant to the topic of the research. The sample members were randomly chosen from each stratum. In each stratum, the members have common characteristics, and the strata are interrelated by virtue of many characteristics that can be measured employing observable latent variables.

5) Cluster sampling: This sampling technique is not widely used in organizational research because of its design. The population was divided into clusters of groups having intra-group heterogeneity (i.e., different characteristics of members within the group) and inter-group homogeneity (the groups, on the other hand, possess similar characteristics). Such a sampling was, however, very useful in social research studies. For example, two groups of different ethnicities may follow this design.
6) Geographical sampling: This is a simple technique in which, the members of a geographical location were grouped together to form a sample.

This research is based on Random Sampling and Geographical sampling where all respondents have equal probability for being chosen in the sample.

The random method is preferred because the study investigates the behavioral intentions of Muslims' consumers and therefore significant number of respondents is needed for the results of study to be generalized to Malaysian Muslim community. Random sampling covers more respondents and a wider area, as well as the responses are free from influence and interruption from the researcher (Bryman & Bell, 2011). Probability sampling, which is known as random sampling postulates that every unit in a population has an equal chance to be a sample for the study. According to Sekaran (2010), when there are generalizability concerns, then probability random sampling is favorable. Therefore, in alignment with the intention of generalization and research objective to cover a large sample within a short span of time, the random sampling method is chosen for the present context of the study.

This study used the non-experimental design which is a survey. The survey can be defined as different pieces of information which are studied one piece at a time from the sample of targeted population (Bryman & Bell, 2011).

The study aimed to determine the impacts of the association of human features (e.g., perception, practice, and consciousness of an individual) with process verification to effectively seek information on halal food among Malaysian Muslim community. Therefore, the importance of halal food wholesomeness was emphasized, which encouraged efficacious searching for halal food among consumers by associating the aforementioned human features with process verification to solve halal food problems in Malaysia. As such, the sample size has been selected from different areas in Kuala Lumpur, Malaysia namely: KL Central, Taman Melati, International Islamic University (IIU) and USIM/KL.

4.7 Construction of the Questionnaire

The questionnaire included 61 statements and questions intended to categorize the inquiries into five sections:

Section A: Demographic Information

Section B: Importance of Halal Food

Section C: Availability and Reliability of Information on Halal Food Products

Section D: Factors Impacting the Choice of Halal Food Products

Section E: Halal food products Information Sources

Five-point Likert scale is used in this study as follows:

Agreement: 1) Strongly disagree 2) Disagree 3) Neutral 4) Agree 5) Strongly agree

Importance: 1) Not at all important 2) Not important 3) Neutral 4) Important 5) Very important

How often/ Frequency question: 1) Never 2) Rarely 3) Occasionally 4) Often 5) Always

Empirical studies have shown 5-point scales to provide an ideal balance of validity and reliability (Dawes, 2008) while still allowing respondents to express ambivalence as necessary (Converse and Presser, 1986).

Section A: Demographic Information

The respondents' basic information is known in this section for descriptive and analytical purposes. The data will be collected on the following variables: Gender, age, education, occupation, residential area and monthly income. Besides, it is useful in categorizing and comparing the respondents in terms of searching for halal food products, and for discovering the relationships between this demographic information and the research variables such as attitude, habit and awareness of individuals.

Section B: Importance of Halal Food

The questions in this section are very helpful in identifying the Malaysian Muslim consumers' attitude, habit and awareness of consuming halal food.

The questions are adapted from the paper of Aiedah Abdul Khalek et al. (2015) in their work titled "A Study on The Factors Influencing Young Muslims' Behavioral Intention in Consuming Halal Food in Malaysia".

Section C: Availability and Reliability of Information on Halal Food Products

This section is intended to investigate the agreement extent of Malaysian Muslim consumers about availability of information sources and their reliability on them.

The questions are adapted from the following works:

1) Leckie et. al. (1996) in their work titled: "Modelling the Information Seeking of Professionals: A General Model Derived from Research on Engineers, Health Care Professionals and Lawyers"
2) Aiedah Abdul Khalek et al. (2015) in their paper titled: "A Study on the Factors Influencing Young Muslims' Behavioral Intention in Consuming Halal Food in Malaysia".

Section D: Factors Impacting the Choice of Halal Food Products

This section is intended to determine the factors affecting consumer's selection of information sources.

The questions are adopted from the following works:

1) Issues of Halal Food Implementation in Malaysia by: Mohd Aliff Abdul Majid et al., 2015
2) Leckie et. al. (1996) in their work titled: "Modelling the Information Seeking of Professionals: A General Model Derived from Research on Engineers, Health Care Professionals and Lawyers".

Section E: Halal Food Products Information Sources

This section is intended to determine the information sources used for searching halal food product. In addition, it describes the importance of selected factors on consumer's choice and way in searching for halal food products.

The questions are adapted and adopted from the following works:

1) The PhD dissertation titled: "Information use environments of religious professionals; A case study of everyday life information seeking behavior of Catholic clergy in Northern Nigeria" By Jacob Danksa, August 2015.

2) The second part were adopted from the paper titled: How graduate students seek for information: Convenience or guaranteed result? By Liyana &. Noorhidawati, (2014). the factors mentioned in the survey are: Convenience, Easy to use, Quick speed, User friendliness, Provision of full text content
3) And the other factors "availability, Quality of data, and cost" are adopted from the thesis of Aman Salem Abdullah (2000) titled "factors affecting international students use of the online catalog and other information sources". The Questionnaire will examine the consumer's importance of above factors if they influence their choice of information sources for halal food product.
4) Issues of Halal Food Implementation in Malaysia by: Mohd Aliff Abdul Majid et al., 2015
5) Concerns for halalness of halal-labeled food products among Muslim consumers in Malaysia: Evaluation of selected demographic factors by: Golnaz Rezai et al. 2009. These features are: Halal traceability, halal assurance system, zero's concept which means no haram material used in the production, certified halal logo, lack of collaboration amongst the world's halal certification authorities, validity of halal logo, guidelines of the production, halal assurance system.

4.8 Human and Information Seeking Metrics of Halal Food Products

To achieve the purpose of this research, a questionnaire was developed to measure the attributes' metrics of human and information seeking that identified in this research among Malaysian Muslim consumers. The table below shows the research attributes, selected metrics and representative references. Based on the research objectives that we are going to achieve.

Table 4.3: Human and information seeking metrics of halal food products

Attribute	Metric	Representative references
Attitude	• Importance of eating halal food • Preferences of consuming halal food compared to non-halal food • Cleanliness of halal food • Safety of halal food • Healthiness of halal food	Ajzen (1991); Ajzen, & Fishbein (1991); Ajzen, (2011); Ajedah et al. (2015).
Habit	• Eating halal food as a part of Muslim or Islamic Identity	Honkanen et al. (2005); Bonne et al. (2007); Nazahah Sutina Junos 2012.
Awareness of Individual	• The extent of not eating doubted halal food • The extent of eating only at halal food places • The extent of verifying the halalness of food product before purchasing or consuming it • The extent of not eating the food if it is prepared using any non-halal ingredients • The extent of checking the ingredients when purchasing halal food • The extent of checking the processing method whether it follows Islamic rules (Shariah) or not	Delener (1994); Abdul Raufu Ambali and Ahmad Naqiuddin Bakar (2012); Ajedah et al. (2015).
Sources of information	• Formal sources used in searching for halal food product • Informal sources used in searching for halal food product • Familiar sources used in searching halal food product • The extent of using information sources that take less time in searching for halal food product • The importance of convenience on the choice of information sources • The importance of ease of use on the choice of information sources • The importance of quick speed on the choice of information sources	Leckie et al. (1996); Aman Salem Abdullah (2000); Liyana & Noorhidawati, 2014.

	• The importance of user friendliness on the choice of information sources • The importance of provision of full text content on the choice of information sources • The importance of availability on the choice of information sources • The importance of quality of data on the choice of information sources • The importance of experience on the choice of information sources • The importance of cost on the choice of information sources	
Process verification	• The importance of certified halal logo on the way in searching for halal food product • The importance of validity of halal logo on the way in searching for halal food product • The importance of halal assurance system on the way in searching for halal food product	Golnaz et al. (2009)
Awareness of information	• The extent of preferences of good accessibility of documents in information seeking for halal food product • The extent of preferences of well-known authors and refereed periodicals in information seeking for halal food product	Leckie et al. (1996);
Traceability	• The importance of halal traceability on the way in searching for halal food product	Golnaz et al. (2009)
Wholesomeness	• The importance of texture in making halal food the most important choice for consumers • The importance of taste in making halal food the most important choice for consumers • The importance of variations in making halal food the most important choice for consumers • The importance of packaging in making halal food the most important choice for consumers	Liow (2012); Ismoyowati, D. (2015).

	• The importance of Affordability in making halal food the most important choice for consumers • The importance of freshness in making halal food the most important choice for consumers • The importance of price in making halal food the most important choice for consumers	

4.9 Data Analysis

The data of this research were analyzed using the statistical package for social sciences (SPSS) Version 21 and Analysis of Moment Structures (AMOS) Version 22. First, a database was created using SPSS. Coding of various independent and dependent variables were inputted into the program no differently than would be done if SPSS was being used solely as the analysis program. As a start point, descriptive statistics were used to help in simplification a large amount of data in a sensible and meaningful way. Frequencies were computed for: gender, age and occupation of respondents. Mean and standard deviations for independent variables were also calculated. Then Reliability test was used to get an idea of the strength of the internal reliability of the measurements of independent variables. Cronbach's Alpha was used to determine this consistency among variables. After that, a Pearson's correlation was used to measure the strength and direction between the seven independent variables, namely: attitude, habit, awareness of individual, sources of information, process verification, and awareness of information, traceability, and the dependent variable, the wholesomeness of halal food. In addition, multiple regression analysis was used to explore the relationship between the dependent variable and the independent variables to help show us how much the variance of the dependent variable can be explained by independent variables. Next, a

new graphic was created using AMOS. A toolbar is used in AMOS to draw the model that is to be tested, with boxes used to indicate independent variables and circles used to indicate dependent variables. Arrows are drawn to indicate relational flow; independent variables are directed toward the dependent variables. After the model is drawn using the toolbar, the data file created using SPSS is selected in AMOS and statistical tests are conducted by the program by using this SPSS data file.

4.10 Summary

The primary goal of methodology chapter is to outline and present methods, approaches and strategies in order to answer the research questions. The instrument used in this research was a survey with structured questionnaire to collect data on attitude, habit, awareness of individual, sources of information, process verification, awareness of information and traceability as independent variables, and wholesomeness as dependent variable.

In short, this chapter was structured in three major parts. The first part presents the overview of research design, methods and definitions of the research variables. As such, it clarifies the data used, population, sampling size, techniques and data collection procedures. The second part focuses on the instrumentation, development of the questionnaire, human information seeking metrics of halal food products and pilot study in terms of reliability and validity. The final part reviews systematic and well-elaborated means to the data analysis.