CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

This chapter discusses the research methodology employed to address the research questions as well as the research objectives discussed in the first chapter. The chapter sought to provide adequate explanation and justification for the research method and techniques used in this research. It provides a detailed description of research method that was used to collect and analyse data that were gathered from SMEs in Malaysia. The chapter extends to providing an overview of the research instrument, data collection and data analysis technique as an essential part of the methodological approach. To ensure that the research objectives of the study are met and the research questions answered the appropriateness of the research instrument (questionnaire) validation based on the pilot test is provided to assess the feasibility of the intended research purpose. This chapter also explains the research methodology used to develop a conceptual model for countermeasures of unintentional insider threats and to evaluate the proposed conceptual model. The relevant work details such as data collection and analysis were also explained. In summary this chapter presents the research design, research framework, and the operational model and research methods employed in the thesis work.

3.2 Research Design

This research employs combination of qualitative and quantitative research approaches. In each stage of this research, the focus was either on the use of statistical

numbers to represent values to theoretical constructs and concepts or on comparison studies and experts review based on their experiences and opinions. The first objective of this research is to identify the factors and likelihood level of unintentional insider threats by focusing on SMEs as a case study. The questionnaire survey was a key tool for collecting data and obtaining the results in order to achieve this objective. Data were obtained from respondents answers by conducting a survey in Malaysian organizations. All questions in the questionnaire were closed- ended questions. The results of the quantitative survey were numbers and calculation.

The second objective of this research is to develop a conceptual model for unintentional insider threats countermeasures. A study and review of the related literature on the existing countermeasures of unintentional insider threats has been made. The qualitative approach was implemented that help in giving a basic understanding and knowledge to develop a proper conceptual model for unintentional insider threats countermeasures. Finally, the conceptual model was reviewed through Delphi methods involving several experts.

3.3 Operational Model

Table 3.1 shows the operational model used in this study. It entails charting out the study problems, goals, actions, and general results of the study.

Table 3. 1: Operational Model

Research Questions	Objectives	Activities	Outcomes
• What are the contributing factors of the unintentional insider threats in Malaysian's SMEs?	• To identify the contributing factors of the unintentional insider threats in Malaysian's SMEs.	•Providing a review of the literature. • Determining the Problem. •Developing a questionnaire.	• Outlined the current study problem statement. • Provided literature review on the UIT contributing factors. • Determined the factors and the likelihood level of unintentional insider threats in an organization.
• How to incorporate the countermeasures of the identified factors into an unintentional insider threats (UIT) countermeasures model?	• To propose a conceptual model for the unintentional insider threats countermeasures based on the contributing factors been.	• Analyse the existing UIT countermeasure models. • Identifying the UIT countermeasures from the literature. • Proposing the conceptual model based on combining existing UIT countermeasure.	• Initial unintentional insider threats countermeasures Model.
• How to evaluate the validity of the proposed model to be used in Malaysian's SMEs?	• To evaluate the theoretical validity, usability, readability and understandability of the proposed model in Malaysian's SMEs by using expert-based judgement through Delphi method.	• Validation by experts' review through Delphi method in two-round evaluation.	• The conceptual model that provides suitable countermeasures to be used in SMEs in Malaysia.

3.4 Research Framework

Figure 3.1 demonstrates the research framework of the current study. It implies the four stages, including conceptual analysis, survey study, model development, and model validation.

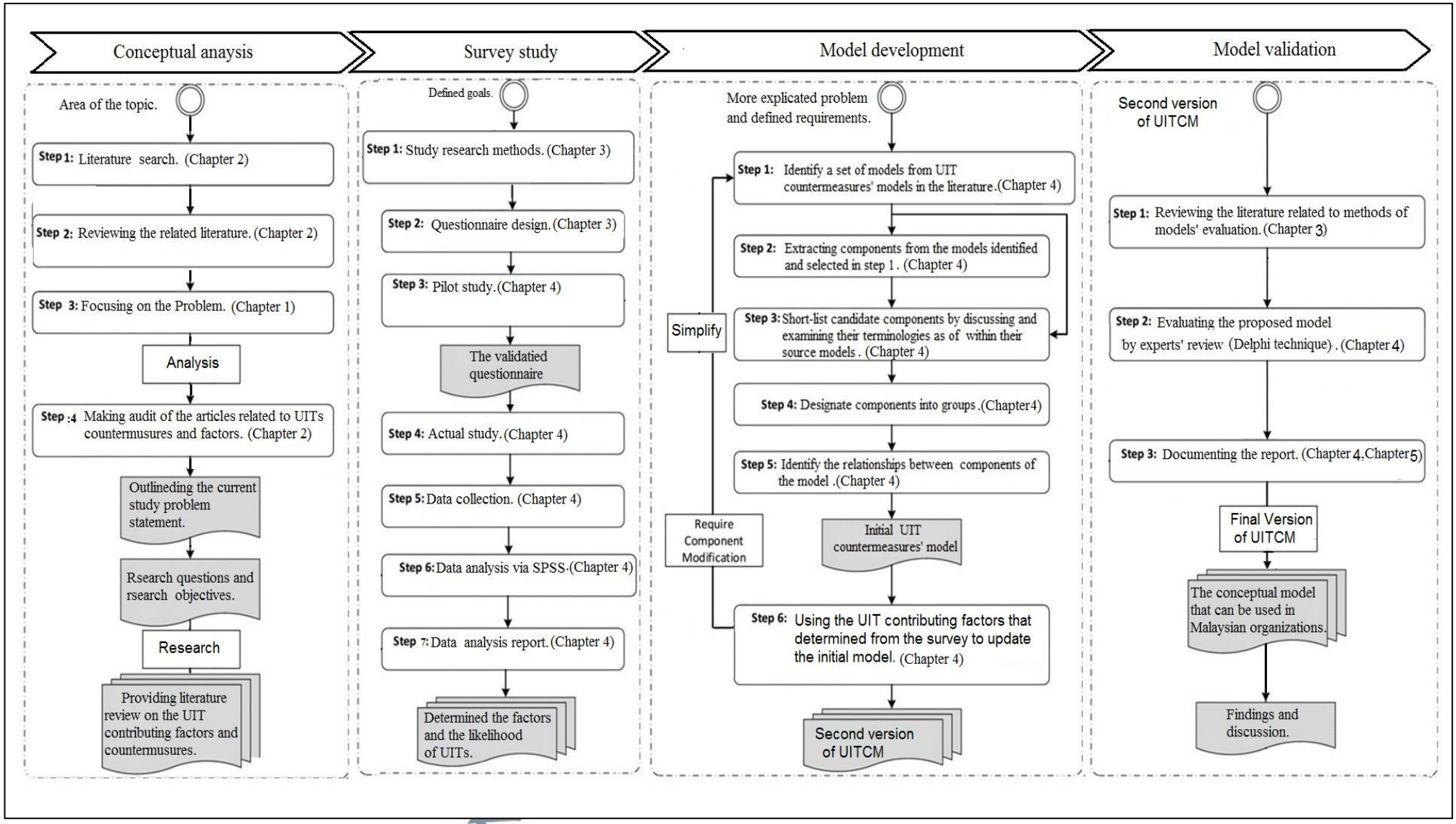


Figure 3. 1: Research Framework

3.4.1 Conceptual Analysis

A systematic review of the previous literature was carried out to identify an area of research concerning UIT contributing factors and countermeasures. Further, it was focused on identifying specific problems, formulating research questions and determining the objectives of the research, as well as the scope of the research. The key outcomes of the current step were the development of the study aims, questions, research problem, scope, and contributing factors of UITs.

3.4.2 UITs in Malaysian SMEs as a case study

The aim of the study was to determine the contributing factors and the likelihood level of UITs in Malaysian SMEs. To achieve the study objectives, an online survey was carried out and qualitative and quantitative techniques were employed. The study participants included 311 IT Executives from 311 SMEs from technology MSC companies that are listed under InfoTech. Small and medium enterprises (SMEs) were chosen to implement the objectives of this study due to their economic importance and because they are more vulnerable to cyber security incidents. Moreover, a tendency to employ the generalists rather than specialists, more reliance on the short-term planning, possession of dynamic and informal strategies and decision-making process (Ghobakhloo et al., 2012).

This study aims to present a conceptual model as a countermeasure to UITs. The basis of the countermeasures model is the existing countermeasures. Expert review using the Delphi approach was used to evaluate the suitability and usability of the proposed model.

This study used qualitative and quantitative methods. Qualitative approach was employed for the descriptive analysis of the features of the respondents' profile and

the first round of Delphi evaluation. While, quantitative approach was employed for the likelihood and contributing factors of UIT and the second round of Delphi evaluation.

3.4.2.1 Survey Study

One of the instruments used in this research is a questionnaire that was distributed to IT Executives in Malaysian SMEs. Respondents were required to evaluate the likelihood level of unintentional insider threats in the organization and identify the most contributing factors of unintentional insider threats which may occur. The questionnaire includes a section to obtain demographic information such as (1) gender (2) age (3) years of experience in IT industry, (4) awareness of unintentional insider threats (5) addressing the organization's policy unintentional insider threats.

Two methods of data collection were used in this study which are theoretical review (secondary data) and questionnaire (primary data). The theoretical review involved a review of the literature, which included a large number of studies related to the contributing factors of unintentional insider threats. The primary goal of this review was to draw conclusions about various topics relevant to the contributing factors of unintentional insider threats in order to develop a questionnaire about the derived contributing factors from the literature.

A. Questionnaire Development

The survey instrument comprises of three sections tailored to address each or multiple objectives of the study. The questionnaire was constructed to support the variables of interest, using a Likert scale to assess each variable.

The subjects were asked to evaluate the likelihood level of unintentional insider threats in their organization which may occur with responses on a 5-point scale ranging from not likely to most likely (1 = Not likely; 2 = Least likely; 3 = Likely , 4 = Very likely; 5 = Most likely). A five - point Likert-type scale was used to increase response rate and response quality along with reducing respondents' "frustration level" (Babakus & Mangold, 1992; Buttle, 1996). A few researchers have, however, reported higher reliabilities for five-point scales (Jenkins & Taber, 1977; Lissitz & Green, 1975; McKelvie, 1978; Remmers & Ewart, 1941). A five-point scale rather than a seven-point scale was chosen for a number of reasons, one being that it became possible to compare reliability coefficients with other research using five-point Likert Scales. (Saleh & Ryan;1991). Previous research has found that a five-point scale is readily comprehensible to respondents and enables them to express their views (Marton-Williams, 1986).The literature suggests that five-point scale appears to be less confusing and to increase response rate (Babakus & Mangold, 1992; Devlin et al., 1993; Hayes, 1992). It has also been suggested that a 5 -point scale is more appropriate for surveys (Bouranta et al, 2009).With a 5- point scale, it is quite simple for the interviewer to read out the complete list of scale descriptors ('one equals Not likely , two equals Least likely …') (Dawes, 2008). Dichotomous Scales was used to determine the contributing factors of unintentional insider threats. A group of variables were created, a separate variable for each potential answer. In other words, dummy yes/no variables were created for each possible reply and were coded it 1 if the respondent checked the box and zero if they did not, to see how many individual answers were selected for each answer option. While the dichotomous Scales is used for clear distinction of qualities, experiences or respondent's opinions, and it refers to the assignment of one of two possible values based on a person's performance or

response to a test question. These values are mutually exclusive, and describe the correctness of a response in the simplest terms possible, as completely incorrect or completely correct. Most cognitive tests involve at least some dichotomously scored items (Stevens, 1946). The instrument for the study questionnaire was adapted from the previous studies work with three parts consisting of likelihood level of UITs, identifying the contributing factors of unintentional insider threats and demographic information .The first section contains demographic information of the respondents .The likelihood level of unintentional insider threats part of the questionnaire was adopted from study scale developed by (Malami et al., 2012; Abu-Musa,2006).While identifying the contributing factors of unintentional insider threat was adopted from the study of (Reza,2016). The questionnaire consists of 26 questions that help identify the contributing factors of unintentional insider threats and likelihood level of UITs. Table 3.2 provides the number of questions that were assigned to each factor. The questionnaire has been stated in Appendix A.

Table 3. 2: Number of Questions for Each Factor

Constructs	No of items
Likelihood Level of Unintentional Insider Threats.	20
Identify the Contributing Factors of Unintentional Insider Threats.	6
Total.	26

B. Survey Administration

Targeted participants were invited through e-mails. The participants received instructions on completing the survey and, each participant was asked to give appropriate response from their experience to all questionnaire's questions. The questionnaire was sent to IT Executives of the selected SMEs in Malaysia who are believed to have had sufficient knowledge, and their responses were collected and analyzed statistically.

C. Population

The study population consisted of a randomly selected sample of IT Executives of Malaysian SMEs who use computing resources as part of their business operation in Malaysia. The study location is Malaysia but confines to SMEs. The SMEs that participated are established in a different location. SMEs listed in Multimedia Super Corridor (MSC) Malaysia were considered as total population for the study. Specifically, the companies that were selected are more focused on information and communication technology (ICT). The study focuses on the technology MSC companies listed under InfoTech.

D. Sample Selection

Selection of the informants is based on probability simple random sampling method. This form of informant selection approach enhances a closed interaction between the research and the informant. It has been referred to as centric approach as it enables the researcher to get accurate information from the respondents towards study objectives, their individual thoughts, and perception (Banister & Booth, 2005). The study population consisted of a randomly selected sample of IT executives of Malaysian SMEs. While the informants discuss their individual experiences, details of their report are documented so as to obtain a clearer understanding for a better insight on their respective experiences and their knowledge.

E. Sample Size

Some common statistical procedures are used to support decisions about determining sample size. Sampling is the process of selecting a small sample from a whole sampling population, to become a basis for predicting the information, state or

results regarding the larger group (Kumar, 2005). According to Sekaran, the sample size for the most research studies should be larger than 30 but smaller than 500 (Sekaran, 2000). In this research, the sample size was 311 participants.

F. Pilot Study

The pilot study was carried out prior to data collection that was reported in this study. A pilot study is necessary as it will reveal deficiencies that can affect the consistency of the survey instrument to quantitatively supply information that was used for analysis. The pilot study was used to validate the appropriateness of the questions for the present study. Data generated during the pilot testing was analyzed and used to screen the questionnaire prior to final data collection. In addition, it also was used to test the feasibility of the survey instrument. Therefore, the pilot study intends to get rid of structural flaws and vagueness from the questionnaire items and by doing so, improve the reliability of the research findings. The results of the reliability and validity tests of the pilot study revealed that the questionnaire was reliable and valid, furthermore, the questions were consistent.

A total of fifty (50) survey questionnaires was used to validate (pilot tested) the survey instrument among IT Executives working in SMEs.

After the verification of the reliability and validity of the questionnaire, the final version of the questionnaire was developed and ready to be administered to the research study sample.

G. Survey Data Analysis

After data collection, the next procedure was data analysis, which involved many steps. The first step was to categorize, edit, and code in order to prepare the data

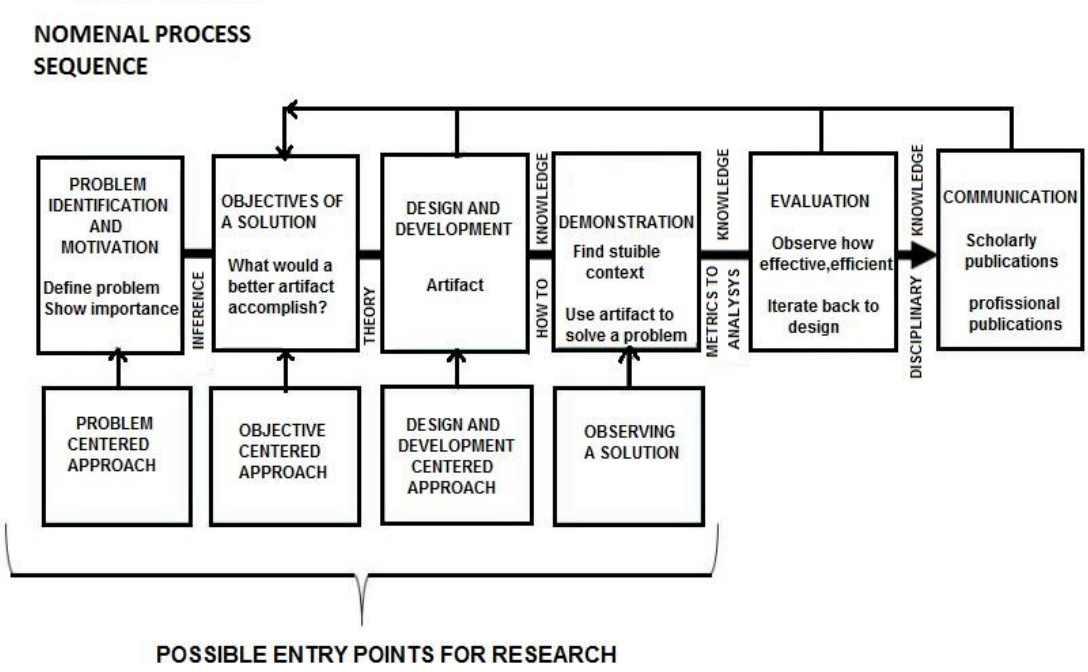
for input, for which SPSS software was used for data screening, coding and detecting outliers and normality. Then, descriptive analysis of the demographic profile information has been used to obtain an overview of the characteristics of the sample.

This data was further tested to ensure it meets the requirements for reliability and validity, through quantitative analysis. Findings were numbers and percentage to identify the contributing factors of unintentional insider threats and likelihood level of unintentional insider threats. Interpretation was the final step of data analysis, where the data editing included checking for incomplete and inconsistent data. Data coding included identifying each data point with a numerical score character. Categorizing was conducted by classifying variables into groups of constructs based on the research design.

3.4.3 Conceptual Model Development

The main goal of this research is to develop a conceptual model of UIT countermeasures. Therefore, this study adopted the design science research paradigm which has widely been used in information technology and information systems researches (Behera and Khilar, 2017; A. R. Hevner, 2007; Peffers et al., 2007; Winter, 2008). Based on the conceptualization that has been given by (Andreasen et al., 2002; Simon, 1996), Design Science (DS) supports a pragmatic research paradigm that called for the creation of an innovative artefact to solve a real-world problem. It then repeatedly redesigns based on evaluations of the early versions of the artefact within an organizational context (Cross, 2007). In this light, the conceptual model of unintentional insider threats countermeasures that developed in this research is a model that discusses a real-world problem and its possible solution. Therefore, the most appropriate method that has been selected for this research is the design science

research (DRS) (Henver, et al., 2004; A. Hevner and Chatterjee, 2010). The selection of this DSR has been made based on that it suits the development of new models, as have been preferably proposed by (Wieringa, 2010) for designing solutions to problems pertaining to the domain of information security. Figure 3.2 shows DSRM that has been adopted in this research.



Source: (Lalla & Flowerday, 2010)

Figure 3. 2: Design Science Research Method (DSRM)

The research method employed in the development of the proposed UITCM consisted of six activities as described in Design Science Research Method (DSRM), developed by Peffers and his colleagues (Venable, 2006). This explicative process consisted of six major activities including, first, identification of the problem and motivation which defined the specific problem that has to be answered. Second, define the objectives to help achieve the anticipated solution for the defined problem. Third, design and development step which focuses in designing and creating the anticipated artefact based on desired functionality and architecture. Fourth, demonstration which

proved that the artefact solved one or more instances of the problem by experimentation, simulation, case study, proof or other appropriate activities. Fifth, evaluation which observed and measured how well the artefact supported a solution to the problem, and finally, communication which published the research to include it to the domain knowledge. The next section provides how the research method has been utilized throughout this research study.

A research method has not always been a discrete process, instead it has various phases of research tasks, for example, according to (Wieringa, 2010) it has often been infeasible to perform the entire cycle of a given DSR methodology within one research. Hence, in this project the evaluation and communication activities in Figure 3.2 is not considered. The DSRM in Figure 3.2 was redesigned by separating the research activities into six development steps. In step 1 the initial problem of the research has been formulated, justified, and investigated by studying a number of existing UIT countermeasures' models and their weaknesses. In step 2 an inclusion criteria has been created to select best suited UIT countermeasures' models that would contribute to the design and development of the new model. Consequently, in step 3 components identified in the selected models have been extracted and reduced those with similar meaning. Components reduced have been consolidated into three main domains of UIT countermeasures. Each component was placed in the group to which it belongs and the model was extended by the countermeasures recommended by previous studies. Subsequently relationships that hold between components have then been identified and initial version of the model is proposed.

In step 4 the components of the model have been checked by comparing components in the initial version of the model to the components that existed in other

UIT countermeasures' models, in addition to the comparison of the proposed model and the existing models with the contributing factors of UITs.

3.4.4 Conceptual Model Validation

This part explains the study approach that was employed to evaluate and validate the presented conceptual model.

3.4.4 .1 Validation and Reliability

Model validation is the set of processes and activities intended to verify that models are performing as expected (Thacker et al., 2004). Since the proposed model and its content are new so the purpose of model validation is to ensure its suitability and usability and understandability (Urbach & Ahlemann, 2010). The general purpose of model validation is to determine whether model fulfil the quality criteria for empirical work. This approach will lead to saving time in implementation stage by not have to redo anything that was not well thought out (Urbach & Ahlemann, 2010). This study achieved the primary validating procedure of the proposed model as the last step of the development procedure. The primary validating of the proposed model in this study is based on a two-stage process, the first one is component investigation and the second one is literatures and existing models analysis. Later, expert review using the Delphi approach was used to evaluate the suitability and usability of the proposed model to be used in organizations.

3.4.4 .2 Approaches to Model Validation

Raising a conceptual model to final model require validation of developed concepts and the whole model. There are several approaches to do that, for example

validating conceptual model on some typical cases, review by experts in the field of interest and member check. Procedure used to validate a model depends on the appropriateness of model structure that is being used, and the field of the model such as psychology, education and information technology. A mix of evaluation approaches can be used to validate conceptual models (Stojanov, 2015; Inglis, 2008).

A review to the literature was conducted in order to determine the possible methods that could be used in validating and reviewing the proposed model (UITCM). From the literature, the researcher found several common methods for evaluating models in the field of information technology. Some models require a mix of validation methods, or validation by experts from different fields, depending on the aspects of the model's evaluation. The approaches of conceptual model validation that were reviewed in this research are showed in Table 3.3.

Table 3. 3: List of the Reviewed Conceptual Model Validation Approaches

NO	Approaches	Methods	Work example
1	Interview	Detailed information regarding the proposed model and any uncertain information is attained by guided interview with experts by open planned meeting.	•(Elmimary, 2017) Generic cloud security model for organizations which require small and medium size cloud (Shantanu Banerjee,2015) Validation and Raising of a Conceptual Framework for Success of IT Offshoring Engagement.
2	Expert's Review	To ask a group of experts to conduct validation of the model proposed for giving essential feedback regarding the quality of a latest model.	• (Mokhtar &Yusof,2015): Function-Based Classification: Model Development and Validation. • (Aziz, et al, 2017) Low Vision Learners to Experience Interactive Assistive Courseware (AC4LV): Initial Round
3	Structural Equation Model (SEM)	This case analyses the relationship between the factors on which the proposed model is made. Here, the data set represents the association between these factors. It is applied by (AMOS Software).	• (Shantanu Banerjee,2015) Development and Validating a Conceptual Framework for IT Offshoring Engagement Success. • (Bughari ,2019)

			Technological factors for Malaysian small and medium enterprises which have adopted cloud computing models.
4	Comparison Study	Comparison between the proposed model and the existing models to present the way it deals with the problems whereas none of the existing models are capable to deal with the identified problems.	• (Angkananon, 2015) The evaluation of requirements and designs through the technology enhanced accessible interaction framework and a method.
5	Components and Processes Validation	The comparison should be drawn between the components used by the existing models and the components in the proposed model to analyze that an agreement is reached among the components introduced in the new model with those existing in the base models. Refining and improvement in the proposed model is assumed when it is validated. Hence, every component of the proposed model assessed should validate that the proposed model is in line with almost every component of the existing models.	• (Elmimary, 2017) Small and medium size cloud consuming organizations can use this generic cloud security model.
6	Case Study	The research into implementation of something in a certain organization or group of organizations like as a system or a practice or handling a problem over a time span. An insight into the real-world experience can be gained by this case study on a certain problem or real-world experiment of how it is applied and how successful it is.	• (Medina, et al,2012): Techniques of validation methods for conceptual modelling: A study on medical devices. • (Md Deros &Yusof ,2008): A conceptual framework will be validated to develop a criterion of implementation in SMEs at six case studies.

In line with the objectives of this study, the expert's validation method was chosen to evaluate the proposed model from various aspects.

I. Expert Validation and Expert Review

Using expert intuition to validate a model is similar to the use of one-step analysis during model validation. The examination of the model should be led by someone other than the modeller, an “expert” with respect to the system, rather than with respect to the model. This might be the system designer, service engineers or

marketing staff, depending on the stage of the system within its life-cycle (Jane, 2003). Stakeholders can be assembled to elicit their expert knowledge, which is tacit as well as explicit (Inglis, 2008). Asking a group of experts to validate the concept at an early stage provides useful feedback on the quality of a newly developed concept. Without the validation, untested data may need revision in a future study (Coombes, 2001). The expert validation is an ideal approach by referring the experts with respect to the models' validation (Hillston, 2003). The expert validation approach is adopted in many research to validate the contents and requirements processes (Beecham et al., 2005; Mathew et al., 2011). Panel sizes have ranged from 3 to 3000. It seems, therefore, that the decision about panel size is empirical and pragmatic, taking into consideration factors such as time and expense (Hassan et.al, 2000). Representation is assessed by the qualities of the expert panel rather than its numbers (Powell, 2003).

To determine the appropriateness of the model with respect to the needs of organizations, the model has been assessed by experts who have a good experience in UIT field. This step is deemed necessary as accumulated experience cannot be undermined to consider the components proposed in the model. Validation procedure in this research is a mix of validation activities, which is necessary to achieve a complete picture of validation competence. This study adopted complete approach to validate the proposed model, by evaluate its suitability and usability from three high level aspects including ,first, if the model is theoretically valid that is, whether the model is logical consistent with the basic theories of UIT countermeasures. Second, the model is evaluated in terms of usability, that is, whether the model can be used in an intended exact setting by organizations. Finally, the model is evaluated in terms of readability and understandability, that is, whether the model is clear and understood by organizations. A questionnaire was developed to gather the experts' feedback on

the proposed model. The format of the questionnaire is adopted from (Nisar & Rozaini,2017; Nordin et al., 2012; Elmismary,2017;Aziz et al, 2015; Bocconi et al, 2007). The questionnaire includes a group of questions questioning regarding the relevance of the components included in the conceptual model, terms used in the proposed model, connections and flows of all of the components, and readability of the proposed conceptual model. The experts were asked to refer to unnecessary or identified as unrepresentative of the component based on the expert's experience, and if the model is theoretically valid. Similarly, the experts were asked to refer to the component that is missing or needs to be improved.

A. Delphi Method

The Delphi method was used in this research as the Delphi process is useful to gather opinions on complex topics when exact information is unavailable. In addition the literature showed that the Delphi method was used as a forecasting technique to predict the probability of future events (Yousuf, 2007). The Delphi method is suitable for this study as it is a group process involving an interaction between the researcher and a group of identified experts on a specific topic, usually through a series of questionnaires (Yousuf 2007). Therefore, the overall goal of the method is to reach a consensus within a group of experts (Okoli & Pawlowski 2004).

According to (Von, 2012) the following characteristics allow for an objective, robust and evidence-based validation process: anonymity, iteration and controlled feedback based on statistical.

The participant confidentiality was achieved through the use of email to exchange information. This aspect of the method is designed to reduce the effects of dominant participants, which is often a concern in group-based methods such as

brainstorming conferences. With this, certain adverse aspects of face-to-face participation such as conformity and group pressure can be reduced. Along with this, by conducting the method by mail or email, the cost of travel time and expenses are eliminated (Hsu & Sanford, 2007).

The iteration was done by using a sequence of questionnaires to collect data and opinions from the group of experts. The process utilizes several iterations to provide feedback to the participants. This feedback enables participants to change opinions. Consequently, the results from previous iterations can change or be adapted by individual participants in later iterations based on the feedback of the group. With this feedback loop the Delphi method attempts to reach a consensus within the group (Hsu & Sanford, 2007).

The controlled feedback was achieved through analysing and summarizing the group response and representing every member opinion equally in the next round. The controlled feedback process for this method is designed to remove noise. Noise can skew the results that occur when the participants focus on group and/or individual interests rather than focusing on problem solving. The feedback process consists of a representation of the prior iteration making it so each participant can see the opinions of the entire group. This allows each participant to make additional conclusions and clarify the information from previous iterations based on these results. Through this process, the participants tend to become more problem solving focused making their opinions more insightful (Hsu & Sanford, 2007).

B. Delphi Process

The Delphi method was used in this research as the Delphi process is useful to gather opinions on complex topics when exact information is unavailable. In addition

the literature showed that the Delphi method was used as a forecasting technique to predict the probability of future events (Yousuf, 2007). A Delphi can be used as an alternative to conventional meetings, to facilitate dialogue to achieve consensus, i.e., on quality indicators and success factors between experts (Von, 2012). The structure and sense of direction of the technique provides focus and avoids entropic and often counterproductive discussions and digressions that bedevil face-to-face group discussions such as problems arising from powerful personalities, group pressures and the effects of status. (WIlliams & Webb, 1994). The Delphi method is suitable for this study as it is a group process involving an interaction between the researcher and a group of identified experts on a specific topic, usually through a series of questionnaires (Yousuf 2007). Therefore, the overall goal of the method is to reach a consensus within a group of experts (Okoli & Pawlowski 2004). Delphi has been used in a wide variety of research areas and most studies use only two or three rounds (WIlliams & Webb,1994). Typical Delphi is three rounds, but also there are studies have been completed in single and double rounds (Irdayanti et al., 2015). The number of Delphi rounds dependents upon the research target and reaching experts' consensus on the issue under evaluation (Skulmonski et al., 2007; WIlliams & Webb, 1994; Irdayanti et al., 2015).

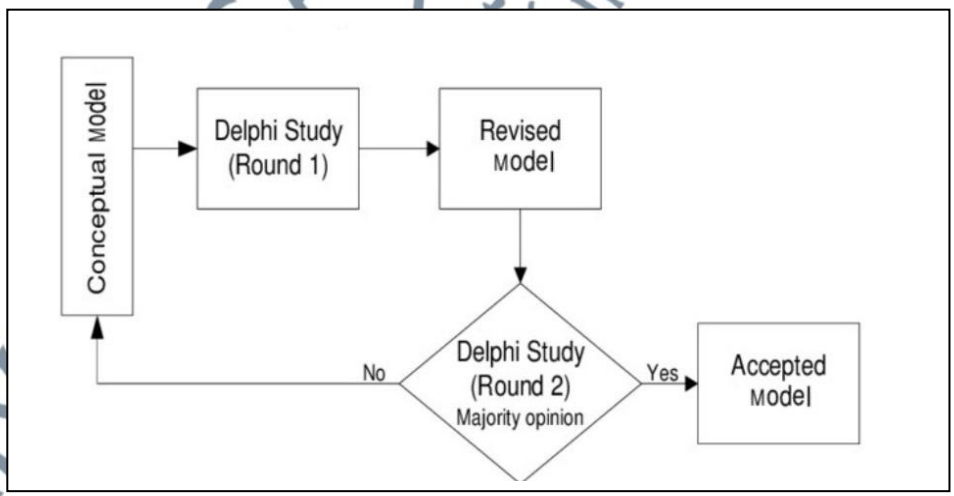
According to (Von, 2012) the following characteristics allow for an objective, robust and evidence-based validation process: anonymity, iteration and controlled feedback based on statistical. The participant confidentiality was achieved through the use of email to exchange information. This aspect of the method is designed to reduce the effects of dominant participants, which is often a concern in group-based methods such as brainstorming conferences. With this, certain adverse aspects of face-to-face participation such as conformity and group pressure can be reduced. Along with this,

by conducting the method by mail or email, the cost of travel time and expenses are eliminated (Hsu & Sanford, 2007). Accordingly, in this work, a two-round questionnaire was developed.

1-The purpose of first round is to review the design of the proposed model and getting the experts' comments on the suitability of the components.

2-The purpose of second round is to proof the expert consensus on the updated version of the model based on previous comments and suggestions in the first round.

The iteration was done by using a sequence of questionnaires to collect data and opinions from the group of experts. The process utilizes several iterations to provide feedback to the participants. This feedback enables participants to change opinions. Consequently, the results from previous iterations can change or be adapted by individual participants in later iterations based on the feedback of the group. With this feedback loop the Delphi method attempts to reach a consensus within the group (Hsu & Sanford, 2007).



Source: (Nordin Norani et al, 2012)

Figure 3. 3: Model Validation Using Delphi Technique

Selection of Experts

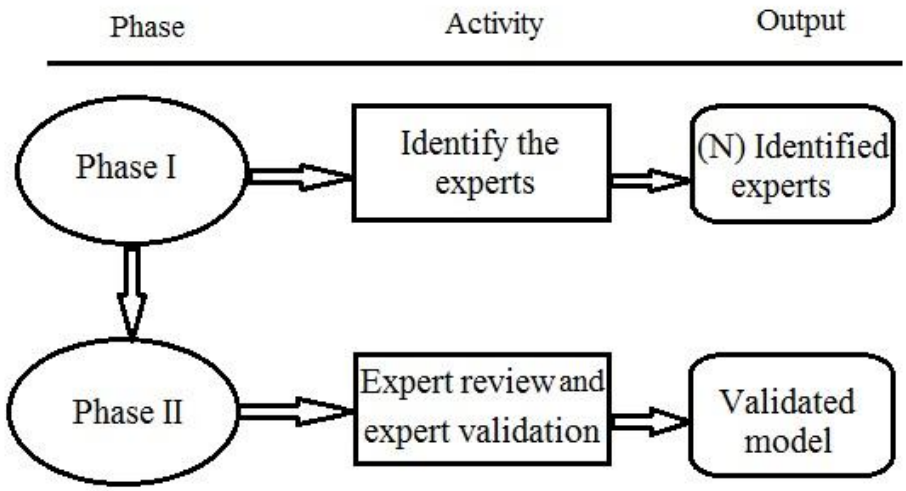
The experts were selected based on the following criteria (Angkananon, 2015).

1- The expert should have certain experience in the study field (academic or practitioner).

2- The expert should have at least five years' experience.

3- The expert should have sufficient time to participate in the evaluation.

In the phase II, the design of the proposed conceptual model, and evaluation questionnaire was sent via email.



Source: Aziz et al, (2015)

Figure 3. 4: Expert's Validation Activities

3.5 Summary

This chapter provided a detailed description of the research method that was adopted in this study. The research method that has been used was the combination of qualitative and quantitative approaches. This research adopted literature review, component investigation, literatures and existing models and expert review to satisfactorily meet the research purpose. It's apparently supremely important to entirely and analyze the methods used because the choice of the methods, instruments,

and procedures ultimately dictate the type of findings that result from a research study. Therefore, this chapter provided an explanation of questionnaire design, data collection methods, UIT countermeasures model development and validation.

In conclusion, the chapter has laid down the method that was used in this research that is appropriate to deliver sound research with viable findings as to infers and sufficiently provide relevant conclusions and recommendations for the organisations by using Malaysian SMEs as a case study.