3.1 Background
This chapter will discuss the research methods that were used to collect the data for the research. A mixed method research approach was applied, with a combination of Quantitative and Qualitative research methods. Since this research intended to produce informational content guideline for e-commerce trust website, it was necessary to use a prototype as a tool to examine the respondents’ trust when they visualise the e-commerce website in real time.

Quantitative research methods are credited for their significant characteristics of establishing a clear purpose, and ensuring testability, replicability, precision and confidence, objectivity, generalisability and parsimony (Sekaran, 1992). Statistical testing ensures that quantitative variables are precisely measured and level of confidence is attained which substantiate the findings. Meanwhile, qualitative analysis is capable of probing relationship characteristics in a more open approach. Qualitative method is capable of capturing a rich array of factors relating to human interaction. Miles and Huberman (1984) describe qualitative data as a “...source of well-grounded, rich descriptions and explanations of processes occurring in local contexts. With qualitative data, one can preserve chronological flow, assess local causality and derive fruitful explanation”.

The adoption of both quantitative and qualitative methods for the trust study on e-commerce yield richer perspectives, leading to a more useful judgment on factors that
make people trust e-commerce. Integrating both approaches has a greater likelihood of enhancing research findings. Quantitative measures develop confidence on pre-determined knowledge, and issues claimed could be established as true or false by collecting evidence in the form of objective observations of relevant phenomena (Mertens and McLaughlin, 2004). Both the quantitative and qualitative methods used should be viewed as complementary where each method enhances and confirms the findings of the other (Patton, 1990). Quantitative and qualitative methods were both adopted in order to provide both breadth and depth in the research. Thus, the adoption of both quantitative and qualitative methods appears to be a more relevant combination in this empirical research. Furthermore, Denzin (1978) stressed that multiple methods should be employed in social science research because each method reveals different aspects of empirical reality.

3.2 Quantitative and Qualitative Research Methods

This research applies a combination of quantitative and qualitative research methods as the research methodology. Both research methods are discussed further below.

3.2.1 Quantitative Research Methods

Quantitative research methods were originally developed in the natural sciences to study natural phenomena. They are concerned with the collection and analysis of data in numeric form (Loraine et al., 1996).
Quantitative research is objective and seeks to measure what is assumed to be a static reality in the hope of developing universal laws using deductive logic. Margaret and Len (1995) stressed that quantitative research provides a statistically valid picture. Examples of quantitative methods now well accepted in the social sciences include surveys and laboratory experiments.

Quantitative research methods also evaluate primary sources. Primary sources are records of events as they are first described without any interpretation or commentary. They also use set of data, such as census statistics, which have been tabulated but not interpreted (Hairston, 1996).

**Advantages and disadvantages of quantitative research method**

According to Herbert (1990), quantitative methods have their advantages and disadvantages. The advantages are:

- Researchers can get data from a large number of people simultaneously and from diverse locations.
- Comparisons can be relatively easy to make because standardized wording and order of questions mean responses can be compared.
- There is a degree of anonymity for respondents
- Respondents can answer from their point of view, selecting what is relevant to them.

The disadvantages are:

- There may be low percentage returns when researchers use questionnaires.
- The actual mass of the data may be difficult to analyzed.
- Researcher bias may occur at the analysis stage.
- There may be a difficulty in understanding questions.
- It is time consuming.

In performing research using quantitative method as one of the methodology, survey research through the questionnaire approach is normally used to gain primary data. The questionnaires were distributed to the respondents. Part of the data gained from the survey were used by the researcher as input to develop a prototype of a trusted e-commerce website using the factors identified in Figure 2.2 in chapter 2.

3.2.2 Qualitative Research Method

Qualitative research methods were developed in the social sciences to enable researchers to study social and cultural phenomena (Myers, 1997). These methods allow a detailed understanding of individuals’ views, attitudes and behaviours.

Qualitative research is subjective and exploratory, aiming at in depth descriptions using inductive logic. For example, qualitative methods include action research, case study research and ethnography.

According to Margaret and Len (1995), qualitative research usually involves a small number of sample units of individuals or groups because the approach used is to explore problems in depth and to identify root and contributing causes.
The qualitative research method evaluates and analyses primary and secondary sources. The primary data sources include observation, interview and questionnaire. The secondary data sources include data gained from general electronic commerce research and articles published in electronic commerce journals, reports and World Wide Web.

**Advantages and disadvantages of qualitative research methods**

Qualitative research allows people to understand the world, which cannot be interpreted by numbers. Putney et al., (1999) give an excellent summary of the positive contributions of qualitative research. Some key points quoted from their article include:

- Qualitative approaches have provided ways of transcribing and analysing the discursive construction of everyday events, of examining the consequential nature of learning within and across events, and of exploring the historical nature of life within a social group or local setting.

- Qualitative research has also provided insights into the knowledge needed by members of a group (especially outsiders) to participate in socially and academically appropriate ways.

- Qualitative research provides information about why and how miscommunication of different groups (e.g., administrators, teachers, ethnic groups, and genders) occurs.

- Qualitative approaches and the theories have made us aware of different voices and the need to consider whose voice will be represented, how that voice will be represented, in what ways, and for what purposes.
The disadvantages of qualitative research as outlined by Peck and Secker (1999) include:

- Current techniques of data collection typically involve semi-structured interviews that can place considerable demands on participants' time.
- Qualitative research is a time consuming exercise, not only in relation to the data collection process but also because the process of analysis involves continual movement between the data and emerging themes to adapt and verify the analytical framework.
- The conclusions of qualitative research are typically disseminated through academic publications and papers. People who are not familiar with these academic sources can find them difficult to follow.
- Time delays between submission and publication may mean that the findings are no longer relevant to the target audience.

Qualitative method will be used by the researcher by employing interview research method in order to gain data from respondents. The interviews are conducted after the respondents viewed and used the developed trust e-commerce prototype.

### 3.3 Research Approach for Data Collection

This research is an empirical study involving exploratory and in-depth investigation. The discussion made earlier has guided the researcher to the two main research methodologies, namely the quantitative and qualitative. In exploratory nature, the survey and questionnaires are used representing the quantitative research method. An in-depth study using interview approach was done representing the qualitative research method.
Both techniques are the main methods used in this research for primary data collection. The data collection initially started from a survey. The survey’s result was used by the researcher to develop a trustworthy e-commerce prototype website. The developed prototype was then used as a tool for interview. Figure 3.1 presents the research approach for the data collection process.

Figure 3.1 – Research Approach
3.3.1 Survey

The survey method represents the most common type of quantitative research approach. Survey research does not belong to any one field. Survey may be used for descriptive, explanatory and exploratory purpose. It is the best method available to the social researcher who is interested in collecting data for describing a population which is too large to observe directly. Any field can be used to gain the actual primary data. Surveys can be divided into two broad categories: the questionnaire and the interview. Questionnaires are usually paper-and-pencil instruments that the respondent completes. Interviews are completed by the interviewer based on respondents’ answers (Trochim, 2002). Survey is also an excellent vehicle for measuring attitudes and orientation in a large population (Babbie, 2004). The main objective of the questionnaire survey was to elicit responses from target respondents consisting of Information Systems Personnel (ISP) throughout the state of Selangor, Malaysia. This research was addressed using a survey design, which is relatively inexpensive, saves time and an effective way of obtaining information on a large number of factors or issues.

**Designing the Survey Research Process**

In designing the survey research process, the researcher performed four main important tasks in order to complete the research. These tasks are designing survey questionnaire, conducting the survey, analyzing the result of the survey and reporting the survey results, as shown in Figure 3.2.
1.  Designing the survey questionnaire - The questionnaire was designed using closed ended question, where the Likert scale was applied. The questions required the respondents to choose their responses based on provided options such as *strongly agree, agree, neutral, disagree* or *strongly disagree*. An example of the survey question is given below;

**D:** What are the privacy factors that you will most likely trust when you shop online?

19.  There is no abuse of my personal information by Internet merchant.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>
In designing the questionnaire, the researcher had utilized the survey as the research instrument in seven major areas of trust discussed in section 2.6 of chapter 2 (see figure 2.2)

![Survey Design Diagram]

**Figure 3.3 - The Survey Design**

**Factors Researched**

a) Profile (9 questions) - The first part of the survey includes the demographic characteristics of the respondents. The respondents were categorized into several segments, such as office location, gender, academic qualification, age, and job designation.

b) The internet usage (6 questions) - This section was designed to find information on the usage of the Internet by the respondents.

c) Security factors (5 questions) - This section provided respondents insight regarding security elements of trust in e-commerce.
d) Privacy factor (4 questions) - This section was applied by the researcher to examine the elements of privacy contributing as a trust factor in e-commerce transaction.

e) Familiarity factor (7 questions) – This section explored the opinion of the respondents on elements of familiarity as a trust factor toward e-commerce.

f) Element of Information factor (29 questions) - This section identified the elements of website information content that contributed to the trust factor of an e-commerce website.

g) General (6 questions) – This section gathered information about the overall opinion on trust in e-commerce.

**Pilot Test**

To determine the effectiveness of the survey questionnaire, a pilot test of the instrument was performed before its actual use. Pilot testing helps the researcher to determine the strengths and weaknesses of the survey concerning question format, wording and order. The procedure also ensures that the terms used are consistent with the published literature. A set of questionnaire for pilot survey was prepared. A pilot survey was conducted with the final year students in the Bachelor of Information System program, Faculty of Information Management, Universiti Teknologi Mara, Shah Alam Selangor. A pilot survey was conducted with the final year students in the Bachelor of Information System program, Faculty of Information Management, Universiti Teknologi Mara, Shah Alam Selangor. Considering their educational background, the Information System
students were able to understand the questionnaire due to the nature of studies which are related to Internet technology and they were also prospective ISPs in future. Therefore, it was surmised that if the junior ISP was able to understand the rubrics of the survey, surely the actual respondents (ISP of Selangor) would not have any problems when answering the questionnaire.

The purpose of the pilot survey was to confirm the validity and understanding of the questionnaire items. The pilot questionnaires were self-administered by the students. The pilot survey provided detailed feedback on the clarity of the questions and the overall comprehensibility of the instrument.

**Outcome of the Pilot Test**

The respondents of pilot test also suggested some factors that should be included in the questionnaires. Their suggestions were incorporated in the final questionnaires. The results of the pilot survey confirmed that the survey questionnaires are appropriate and valid. The questionnaires were successfully refined based on the suggestion made by the respondents in the pilot test. The final survey questionnaires, attached with a cover letter explaining the nature of the study, were then distributed to the ISPs of the state of Selangor in Malaysia.

The survey was conducted from January 2005 to March 2005.

2. Conducting the Survey - This task involves the distribution of the questionnaire to the ISPs who were the research participants. A period of three-month was determined for the distribution and collection of the questionnaires.
The researcher had scheduled that the questionnaires be collected within the three months. It is believed that collection of the questionnaires within a three-month duration is sufficient for the ISPs to participate in the survey.

3. Analyzing the survey results - Data gained from the questionnaires will be analysed using the numeric data percentage method. SPSS application was used to analyze the data collected.

4. Reporting the survey result – The final task of the survey research process is to report the research result. The research report also contains analyses of data performed in previous task.

3.3.2 Interview

The interview-based technique is the second method of primary data collection. This method is appropriate for this study due to its strength in eliciting insights (constructs) relating to trust factor in e-commerce. To further identify and to get better insights regarding trust factor, the ISP’s were interviewed. Interview is a more personal form of research strategy than questionnaire. In the interview, the researcher works directly with the respondents. In this study, this qualitative research strategy interview sought to describe the central theme of trust in e-commerce. The main task in interviewing is to understand the meaning of what the interviewees say. An interview seeks to cover both a factual and a meaning level, though it is usually more difficult to interview on a meaning level (Kvale, 1996). Interview is particularly useful for getting the story behind a participant’s experiences. The interviewer can pursue in depth information around the topic. Interviews may be useful as a follow up strategy to certain responses to the
questionnaire (McNamara, 1999). The interview is an interaction between the interviewer and the respondent where the interviewer may have a general plan of inquiry but not a specific set of questions that must be asked. Ideally, in the interview process, the respondent does most of the talking (Barbie, 2004).

According to Pickard (2007), there are two main types of interview that the researcher can use as a method for data collection. They are structured interview and unstructured interview, and are explained further in the following paragraphs.

**Structured interview**

Structured interview refers to a situation in which an interviewee will be asked with predetermined questions set by the interviewer earlier. There are two forms of structured interview, as described below.

1. Standardized open-ended interview; this is where the same open-ended questions are asked to all interviewees. This approach facilitates faster interviews that can be more easily analyzed and compared.

2. Closed, fixed-response interview: this is where all interviewees are asked the same questions and asked to choose answers from among the same set of alternatives. This format is useful for those not used to the interview.

**Unstructured Interview**

This approach is used to gain a holistic understanding of the thoughts and feelings of the interviewee. There are two forms of unstructured interview, as described below
1. Informal, conventional interview: this is where no predetermined questions are asked, in order to remain as open and adaptable as possible to the interviewee’s nature and priorities; during the interview the interviewer goes with the flow of questions, which may or may not have been planned earlier.

2. General interview guide approach: the guide approach is intended to ensure that the same general areas of information are collected from each interviewee. This provides more focus than the conventional approach, but still allows a degree of freedom and adaptability in getting the information from the interviewees.

In this research, the researcher utilized a standardized open-ended interview. All the research respondents were given the same questions in order to gain standard information and this facilitated generalizations to be made.

**Designing Interview Questions**

In investigating trust in e-commerce, the researcher used a standard open-ended type of interview. This means that the questions used by the researcher were open-ended that provided respondents the freedom to express their opinions. The interview questions tried to investigate the causes of trust or why there was lack of trust among Internet users when shopping on the Internet. The standardized interview facilitated the data analysis process for this research. The interview questions were divided into four main parts as shown in Figure 3.4 and explained further following the figure:
Figure 3.4 Interview Instruments

Part A: Content – In Content, the respondents were asked about their opinions on the content of the e-commerce prototype website, for example:

“Do you think that easy access to information is important to trust an e-commerce website?”

Part B: Security – In Security, the respondents’ opinions about security were solicited after they had viewed the e-commerce website prototype, for example,

“Do you think that by clearly stating the merchant’s brand name it made users more confident to trust the e-commerce website?”

Part C: Privacy – In Privacy, the respondents’ opinions about security were asked after they had viewed the e-commerce website prototype, for example,

“Does e-commerce website provide the ability to personalize users’ in an afford contents to enable people to trust e-commerce transaction?
Part D: Presentation - In Presentation, the respondents were asked about their opinions relating to the presentation of the e-commerce website prototype, for example,

“Does the e-commerce website provide video element to enable people to trust the e-commerce transaction?”

3.4 Prototype

After the survey was conducted by the researcher, an e-commerce prototype was developed. The prototype included all element of information felt necessary to support the importance for trust building in e-commerce interaction. Prototype is the process of creating an incomplete model of the future full-featured software program, which can be used to let the user have a first idea of the completed program. It allows the client to evaluate the program. Prototype provides the software designer and implementer a way of getting feedback from the user during the early development stage. It also allows the software engineer some insight into the accuracy of initial project estimates and whether the deadlines and milestones proposed can be successfully met. The client and the developer can determine if the software made matches the software specification, according to which the software program is built (Grimm, 1998).

There are many prototypes available in information system development. However, the researcher decided to use Throwaway Prototyping or Rapid Prototyping. This prototype refers to the creation of a model that will eventually be discarded rather than becoming part of the final software. After preliminary requirements gathering was accomplished, a
simple working model of the system was constructed to visually show the users what their requirements may look like if it was implemented into a finished system.

Crinnion (1991) explains that Rapid Prototyping involves creating a working model of various parts of the system at a very early stage, after a relatively short investigation. The method used in building the prototype model is usually quite informal, the most important factor being the speed with which the model is provided. The model then becomes the starting point from which users can re-examine their expectations and clarify their requirements. When this has been achieved, the prototype model is 'thrown away', and the system is formally developed based on the identified requirements.

The most obvious reason for using Throwaway Prototyping is that it can be done quickly. If the developers can get quick feedback on their requirements, they may be able to refine them early in the development of the software. Making changes early in the development lifecycle is extremely cost effective since there is nothing at that point to redo. If a project is changed after considerable work has been done, then small changes could require large efforts to implement since software systems have many dependencies. Speed is crucial in implementing a throwaway prototype, since with a limited budget of time and money, little can be expended on a prototype that will be discarded.

Furthermore, the strength of the Throwaway Prototyping is its ability to construct interfaces that the users can test. The user interface is what the user sees as the system,
and by seeing it in front of them, it is much easier to grasp how the system works. A
detailed discussion on the prototype is provided in Chapter Five.

3.5 Establishing a Sample Population

Establishing a sample population is the process of selecting a sufficient number of
elements from the population. According to Sunny and Matthew (1996), a sample is a
limited number of respondents taken from a large group for testing and analysis, on the
assumption that the sample can be taken as representative of the whole group.

According to Madhari (2006), research must be focused and specific. It is important
because of the constraints each research will have in term cost and time. As a result, it
was decided that the public sector Information System Personnel (ISP) in the state of
Selangor, Malaysia would be the respondents for the research. They were chosen
primarily because:

1. It was assumed that they were Information and Communication Technology
   expert users. This research required the participants to be familiar with
   computer and Internet skills in order to gain a reliable and real insight.

2. It was assumed they possessed formal education in the area of Information
   Technology from higher learning institutions; at least possessing a diploma
   level qualification.

3. It was assumed they had experienced in website development and used the
   computers in their daily work. It was also assumed they were able to provide
   expert opinions based on their understanding of user requirement.
The state of Selangor was chosen as the focus area because it is the first developed state in Malaysia. Also, Selangor is Malaysia’s e-commerce hub, with the Multimedia Super Corridor project.

3.6 Statistics of Information System Personnel in Selangor

It was decided that the Information System Personnel in the public sector in Selangor would become the sample of the research. However, the question earlier on was to know the number of ISPs working in the public sector in Selangor. Initially, the researcher contacted the Secretary of the State of Selangor office which is the Headquarters for Selangor state government office to get the numbers of the ISPs in Selangor. They provided the information on the number of ISPs that served with the Selangor public sector. However, the office does not keep a record of the numbers of ISP attached to the local authority. The researcher managed to get information of all the local authority officers by contacting the local authority via telephone. With the cooperation given by the local authority, the statistics of ISPs in the public sector in the state of Selangor was compiled, as shown in Table 3.
Table 3.1: The Number of ISPs in Selangor Public Sector

<table>
<thead>
<tr>
<th>Location</th>
<th>System Analyst</th>
<th>Programmer</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secretary - State of Selangor</td>
<td>15</td>
<td>45</td>
<td>60</td>
</tr>
<tr>
<td>Shah Alam City Council</td>
<td>2</td>
<td>18</td>
<td>20</td>
</tr>
<tr>
<td>Petaling Jaya City Council</td>
<td>3</td>
<td>10</td>
<td>13</td>
</tr>
<tr>
<td>Subang Jaya Municipal Council</td>
<td>2</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>Selayang Municipal Council</td>
<td>5</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>Kelang Municipal Council</td>
<td>2</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Kajang Municipal Council</td>
<td>2</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Sepang Municipal Council</td>
<td>9</td>
<td>10</td>
<td>19</td>
</tr>
<tr>
<td>Ampang Jaya Municipal Council</td>
<td>2</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Kuala Selangor District Council</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Hulu Selangor District Council</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Sabak Bernam District Council</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Kuala Langat District Council</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>158</td>
</tr>
</tbody>
</table>

3.7 Conclusion

The research focused on both secondary and primary data. For the secondary data, thorough reviews were done and for the primary data, questionnaires and interview techniques were used. Survey was conducted with the intention of capturing respondents’ feelings and opinions about trust in e-commerce, whereas the interview was a process to gain respondents’ thoughts on trusted information element in e-commerce after viewing the prototype website.