

Key Determinants of Internet banking in India: an Exploratory Study

*Dr. Rashmita Sahoo**

Soumendra Patra**

*Lecturer, Dept of Business Administration, Utkal University, Bhubaneswar, Orissa, India.

**Assistant Professor, Regional College of Management, Bhubaneswar, India.

Abstract

The main objective of this research is to identify the key factors that determine success and intention of Internet banking users toward their actual behaviour. The research setting was in Odisha, India. The research design was based on positivistic paradigm with a triangulation approach in the process of collecting and analysing data. The data was collected through 220 survey questionnaires and 9 semi-structured interviews of top managers and senior consultants of the participated banks who involved with Internet banking projects. Statistical analysis included descriptive statistics, R^2 , t-test, F-test, Confirmatory Factor Analysis (CFA), and the Structural Equation Modelling (SEM) techniques.

Keywords

Internet banking, online banking, The Theory of Planned Behaviour, TPB, The Technology Acceptance Model, TAM

1. Introduction

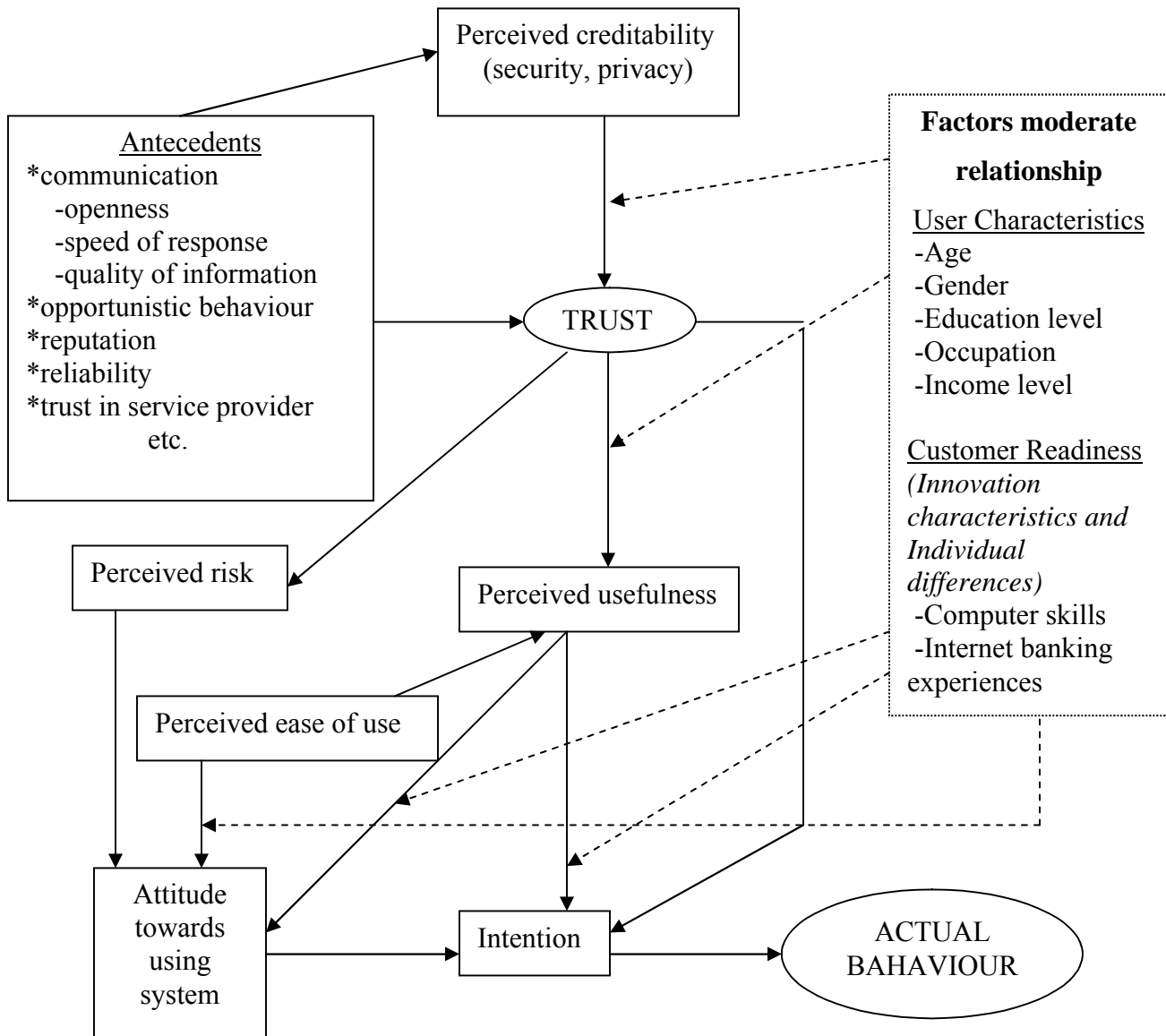
The emergence of e-commerce has revolutionized the way we live, shop, entertain and interact. Therefore, it should not come as a surprise if it tries to influence the way we save and the way we invest. In their quest to differentiate their services and gain competitive advantage over their competitors, the financial service providers are trying to provide their services to the customers in the comfort of their homes. The Internet has emerged as a convenient channel for these service providers. In true Internet banking, any inquiry or transaction is processed online without any reference to the branch (anywhere banking) at any time. Providing Internet banking is increasingly becoming a "need to have" than a "nice to have" service. The net banking, thus, now is more of a norm rather than an exception in many developed countries due to the fact that it is the cheapest way of providing banking services. In order to rise to the challenges service provider are even more interested to enhance their understanding of consumer behaviour patterns. This paper examines the impact of online determinants on Adoption of internet banking services in India. Marketing implications that can be drawn from the findings will assist service providers in understanding consumers better and making justified marketing decisions

2. Background

The research setting in this study was in Odisha, India. Its objective came from the fact that Internet banking customers gain more benefits than the traditional banking customers as they can access 24-hours services in everywhere. It is, however, revealed that Internet banking services have been underused by the potential customers in spite of their availability. This demands the need for the research to identify the key factors that determine success and move intention of Internet banking users toward their actual behaviour.

The relevant literatures have been reviewed and indicate that The Theory of Planned Behaviour (TPB) (Azjen, 1985, 1991) and The Technology Acceptance Model (TAM) (Davis, 1986) are crucial in predicting Internet banking users’ behaviour. However, other variables such as antecedents and perceived credibility are needed to enhance predicting power. Thus, the proposed conceptual model is shown in Figure 1.

Figure 1: Proposed Conceptual Model



- Note: 1. Perceived usefulness, perceived ease of use and perceived credibility are adopted from modified TAM (Pikkarainen *et al*, 2004).
2. Attitude towards using system is adopted from decomposed TPB

This essay focuses mainly on the research design which is based on positivistic paradigm with a triangulation approach in the process of collecting and analysing data followed by the data collection and procedures. These include survey questionnaires, validity and reliability of measures, semi-structured interview and document analysis. Then, data analysis will be discussed. Finally, ethical issues and conclusion will be briefly mentioned.

3. Research design

To find real answers to the research questions, the concept of paradigm in social science was adopted. Hart (2003) defines paradigm as the progress of scientific practice to describe how scientists work within accepted ways of defining, assigning categories, theorizing and procedures within disciplines. According to the concept, paradigm is based on scientists' assumptions about the world. Different research paradigm implies different methodology and different research methods to collect data and finding solution to problems and of explaining events. Conceptually, many paradigms exist in social science which have long been debated and criticised.

With this research, it is attempted to predict customer behaviour in adopting Internet banking through the model by establishing casual relationships between the variables. In this case, the ontological assumption is objective which can be observed and measured. Hussey and Hussey (1997) point that, under a positivistic paradigm the process is to study the literature to establish an appropriate theory and construct a hypothesis. The theory, hypothesis and model in the study were derived from the literatures which can be tested by using statistical analysis.

Move on to benefits of applying triangulation approach in this research, the use of large sample size of survey questionnaires is for unbiased statistical results and is believed that it can be implied for the whole population (Miller *et al.*, 2002).

The semi-structure face-to-face interview is designed to qualitatively analyse respondents' free-format comments on the main subject. It adds rich to the findings. Document analysis, such as banks policy, annual reports and strategic planning, can help better understanding of the research findings.

4. Data collection and procedures

This section will focus on the triangulation approach in practice. It is started with the procedure of conducting survey questionnaires, followed by validity and reliability of measures. Then semi-structured interviews are discussed. Finally, document analysis is explained.

4.1 Survey questionnaires

Stroh (2000) states that a questionnaire is used to explore a large number of people's views. Hence, it is used to gain general picture of factors affecting customers' decisions of whether to use Internet banking services. Statistically, it is believed that large sample size of questionnaires is designed for unbiased statistical results which can be implied for the whole population (Miller *et al.*, 2002). Harris and Schaubroeck (1990) recommend a minimum sample size of 200 to guarantee robust structural equation modelling. The data for this research was collected through 1,200 survey questionnaires i.e. 300 questionnaires for each bank, completed by the randomly selected from current users of Internet banking of the participated commercial banks. The expected return ratio is about 10-20% (120-240 samples) which is large enough for the analysis. The target age of respondents is between 20 and 45 years as it is the largest technological absorption ability group in Thailand (Bank of Thailand, 2004). Official letter issued by the university where the researcher is affiliated to and signed by a supervisor including a research proposal were sent to the managers of the participated banks for the execution of this research. Due to the fact that customers' information such as names and addresses is prohibited to disclose to outsiders, thus, these participated banks were asked to nominate a contact person to assist the researcher in randomly distributing and collecting the survey questionnaires.

4.2 Validity and reliability of measures

Validity and reliability of measures are two of crucial parts in a research process. *“It is generally accepted that when a concept has been operationally defined, in that a measure of it has been proposed, the ensuring measurement device should be both valid and reliable”* (Bryman and Cramer, 2005, p.76).

This research combines both qualitative and quantitative techniques; therefore, care is taken into the design of the research to ensure that validity and reliability are addressed appropriately during data collection and data analysis processes. The details to establish validity and reliability are as follows:

Validity is synonymous with accuracy or correctness (Churchill and Iacobucci, 2002) and is an important measure of a survey instrument’s accuracy (Litwin, 1995). It tells us whether the question or item really measures what it is supposed to measure (Oppenheim, 1984, Baines and Chansarkar (2002), Parasuraman, (1991), and Peterson, 2000). When a measure is valid, it is believed to be free from error. Thus, it reflects true value of the item we seek to measure. In other words it reflects the characteristic that it is supposed to measure and is not distorted by other factors, either systematic or transitory. Although it is difficult to identify whether a measurement is valid, it can be inferred. Churchill and Iacobucci (2002) suggest two bases for inference: direct assessment employing validity and indirect assessment via reliability.

4.2.1 Direct assessment employing validity

Theoretically, there are several different approaches to evaluate validity depending on the purposes of a scale to be used. In this research, two types of validity: content and construct validity were assessed.

-Content validity

Content validity focuses on the adequacy with which the domain of the characteristic is captured by the measure (Churchill and Iacobucci, 2002, and Baines and Chansarkar, 2002). Bryman and Cramer (2005) assert that it is the very minimum requirement for a researcher to establish it. Having done this, the measure apparently reflects the content of the concept in question. Practically, it can be established through literature review. Yin (1984) recommends that concerns should be addressed by using two techniques: having multiple sources of evidence and reviewing the key informants. Thus, qualitative data in this research was mainly gathered by reviewing existing literatures, documents issued by participated banks and other related sources, personal interview and semi-structured interviews with top managers and senior consultants who were involved in Internet banking projects. The process was to ensure that all necessary issues were included in the survey.

-Construct validity

Construct validity is most directly concerned with the question of what the instrument is measuring. It involves the measurement of correlation with similar and dissimilar variables. It lies at the very heart of scientific progress but it is the most difficult type of validity to establish (Churchill and Iacobucci, 2002). Bryman and Cramer, (2005) advise that the researcher is encouraged to deduce hypotheses from a theory that is relevant to the concept. Following the advices, validity of questionnaire was addressed during construction of the instrument. A list of key factors for Internet banking acceptance was extracted from theories such as Theory of Planned Behavior-TPB (Ajzen 1985, 1991) and Technology Acceptance Model-TAM (Davis, 1986). These key factors such as perceived usefulness, perceived ease of use, security and privacy were sufficiently confirmed by previous researchers to have construct validity. More factors such as antecedents were developed during the discussions and suggestions from personal interview with current Internet banking users. This list was reviewed for completeness and developed into the questionnaires before pre-test and pilot test were performed. Moreover, questions for the measures, which were confirmed to be valid, were borrowed and adapted from previous researches.

To evaluate construct validity, it is generally accepted that if a measure possesses construct validity, it must be internally consistent (Churchill and Iacobucci, 2002). There are 2 sub dimensions: convergent validity and discriminant validity. Convergent validity is established if the measurement of a construct with dependent measurement techniques demonstrates a high correlation among the measures (Kinnear and Taylor, 1987). Litwin (1995) proposes that a correlation coefficient between two sets of data with the levels of 0.7 or more are generally accepted as representing good validity.

Discriminant validity involves demonstrating a lack of or low correlation among different constructs (Kinnear and Taylor, 1987, Churchill and Iacobucci, 2002).

4.2.2 Indirect assessment via reliability

Reliability is consistency to obtain the same results again (Oppenheim, 1984, and Peterson, 2000). It is an important measure indicator of a measure's quality because it determines the impact of inconsistencies in measurement of the results. Reliability can be indirectly inferred by validity. If a measure is valid, it is reliable. If it is not reliable, it cannot be valid (Churchill and Iacobucci, 2002). Many experts suggest that the reliability of the instrument should be established before it is used for a substantive study and not after (Malhotra and Birks, 2000, Baines and Chansarkar, 2002, Peterson, 2000, Backstrom and Hursh-Csar, 1981, Proctor, 1997, Erdos, 1983, Labau, 1981, Peterson, 2000, Schuman and Presser, 1981, Sudman and Bradburn, 1983, and Churchill and Iacobucci, 2002).

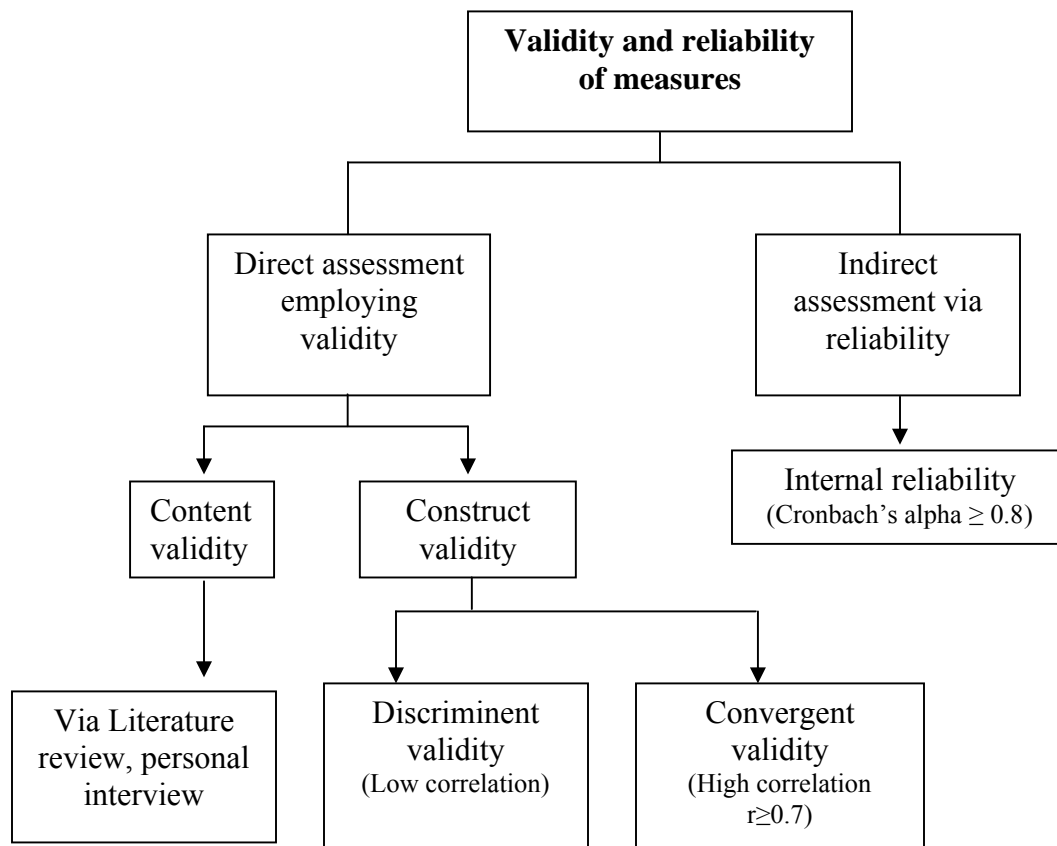
The design of the measure in this study consisted of sets of attitude questions to measure different aspects of the same concept not a single item. Litwin (1995) claims that the data set is richer and more reliable if several different items are used to gain information about particular behaviour or topic. They are regarded as more reliable than single opinion items as they give more consistent results (Oppenheim, 1984).

To evaluate reliability, Litwin (1995) proposes four different ways: test-retest, intra-observer, inter-observer and internal consistency. This study, however, focused on internal consistency reliability as it is more applicable than the others.

Internal consistency reliability can be practically measured by calculating a statistic known as Cronbach's coefficient alpha. The rule of thumb is that the result should be 0.8 or above (Litwin. 1995, Malhotra and Birks, 2000, Churchill, and Lacobucci, 2002, and Bryman 2005).

The summary on the methods employed to establish validity and reliability of measures is depicted in the Figure 2.

Figure 2: The methods to establish validity and reliability of measures



Source: This research

4.3 Semi-structured interview

The semi-structured face-to-face interview is designed to qualitatively analyse respondents' free-format comments on the main subject. It can '*explore the actor's definition and how people act which gives meaning to their own lives*' (Eyles, 1989, p. 380). It can be used to verify, enhance, and fill in the data collected from the survey. In this research, total 9 top managers and senior consultants of the participated banks were interviewed independently. They were selected based on their working experiences and the level of involvement in Internet banking projects in their organisations. The interviews were conducted in a semi-structure format that allows respondents to express their own viewpoints (Flick, 2002). Respondents were guided by a list of interview topics about key factors determined the acceptance of Internet banking. This purposed to gain the respondents' opinion about them. It was however occasionally that the respondents raised new issues such as a regulation control. There was no bias problem from leading respondents to focus only items on the list because the list was used as an outline of the interview. Respondents were free to discuss at all time. The interview was conducted in Thai language and interview time was varying in length from 30 minutes to one hour. It was necessary to ask permission from some participants to follow up the interview as more information may be required. The interview was recorded by both note taking and taping which facilitates less interruption in the interview for extensive of note taking.

4.4 Document analysis

Document analysis, such as banks' policy, annual reports, strategic planning, journals and magazines can help better understanding of the research findings. The data collected from these sources are within the bank industry, Internet banking concept and technology used as distribution channels in the financial industry. For example, banks' public relation departments was approached by telephone calls and personal visit at the branch in order to obtain relevant data from the information packages which contain banks' publications and services brochures. Moreover, books about banking industry and their strategies were searched in order to get an overall picture of industry and technology impact. In addition, research reports with the related topic were gathered for figures and statistics.

The information from these reports was expected to use in order to support the argument. Web pages of the participated banks were also accessed by Internet to get up-to-date information about the banks' missions, services offered and future services they plan to deliver. Frequently Asked Questions (FAQ) pages of the banks' web page were also accessed to analyse concerns of customers who were questioning to banks.

5. Data analysis

Tabachnick and Fidell (1983) suggest that data abnormalities may lead to an inaccurate analysis and caution in scrutinizing data for these abnormalities is a prerequisite for mature analysis. Thus, problems of missing data, outliers, multi-collinearity and violations of statistical assumptions were diagnosed and corrected before applying statistical procedures.

Figure3: Outputs from Structural Equation Modeling:

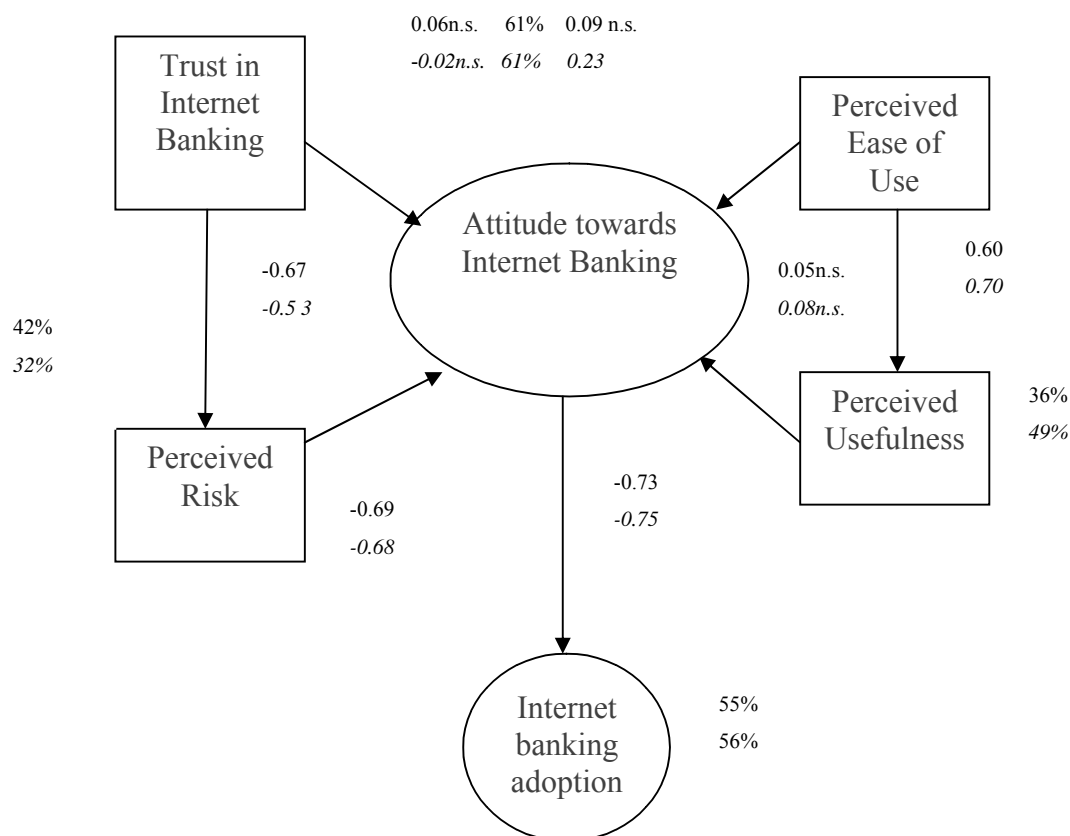


Figure3: SEM estimation results. Standardized path coefficients are significant at $P < 0.005$ except otherwise noted. Normal font represents values of the pure player online store, italics font represents values of the bricks-n-clicks player. Percentages indicate squared multiple correlations (variance explained).

Table 1: Goodness – of – fit values

Goodness-of-fit measure	Acceptable values(Hair et al, 1998)	Pure Player	Bricks – n – clicks
X^2	NS	92 ($P < 0.001$)	108 ($P < 0.001$)
RMSEA	< 0.08	0.05	0.05
GFI	No established thresholds (the higher the better)	0.90	0.89
NFI	0.90	0.90	0.93
TLI	0.89	0.97	0.98

RMSEA: Root Mean Square Approximation, GFI: Goodness-of-Fit Index, NFI: Normal Fit Index; TLI: Tucker – Lewis Index.

Based on the information collected, investigation, evaluation and discussion were established in the thesis paper. As for the questionnaires survey data, it was analysed by using SPSS and AMOS Statistical Packages. Statistical analysis such as descriptive statistics, X^2 , t-test and F-test were also performed. In addition, this study employs the structural equation modelling (SEM) technique. SEM allows the simultaneous examination of the effects of the antecedents on user acceptance as opposed to ordinary regression analysis.

The semi-structured interview was analysed by applying qualitative data analysis techniques such as Strauss's grounded theory, a scheme which attempts to ground all concepts and analysis in the data themselves (Strauss, 1987) and '*contingent methods to capture the richness of context-dependant sites and situations*' (Baxter and Eyles, 1997, p. 505). In addition, some of the articles deliver quantitative and qualitative data which was used as evidence to support the argument. The reliability and validity of these evidences were evaluated based on the creditability of the sources they cited.

6. Conclusion

In short, the primary main methodology of this research is based on a triangulation approach. It consists of several processes. The first phase is a survey questionnaire which is used to explore customers' perceptions in adopting Internet banking in general. This is enable exploration of a large number of people's views however, the depth of research is limited because the answers are predetermined and standardised. The second phase, document analysis, helps to clarify understanding of matters raised from the survey. The final phase, semi-structure interviews, is proceeded after data analysis. This helps to add richness to the findings as it provides a wealth of rich data and reflects people's opinions and attitudes (Bryman, 2004).

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