CHAPTER SIX

CONCLUSION

6.0 Introduction

This chapter draws together the overview of this research and then presents the core contribution of the research. In addition, the limitations of the research and future research recommendations are presented.

6.1 Overview of Study

This research argues that information privacy of cloud based e-learning users is at risk due to the quick advancements in cloud computing technology and the lack of an information privacy framework to protect personal information in the cloud based e-learning systems. Although, the increased value of information and amount of information being processed in the cloud computing, there are still inadequate guidelines for adopting cloud computing (Mokhtar et al., 2014; Shimba, 2010). This research focuses on information privacy issues of using SaaS in public cloud in e-learning system. This research study involves identifying the factors that are most likely have a significant influence on information privacy concerns and its impact on the risk and trust beliefs within the context of cloud based e-learning.

Thus, this research performs a systematic search of previous studies from books, academic magazines databases, journals, government reports, web pages, and published articles regarding the research area. This data is necessary to achieve a better understanding of the study subject and what has already been done. The findings of the systematic research are used to develop a conceptual framework that explains the relationship between information privacy concerns and other important factors. A

questionnaire is developed based on the reviewed literature. The theoretical model is evaluated in the last phase.

As mentioned earlier in Chapter 3, the pre-test is followed by a pilot study which is assessed by academics and e-learning center staff members. The main survey is conducted and tested using statistical data reduction techniques, i.e. exploratory factor analysis (EFA) and confirmatory factor analysis (CFA).

The quantitative data is analyzed using Statistical Package for the Social Sciences (SPSS) version 22 and Analysis of the Moment Structures (AMOS) version 23. The result shows that the constructs of interest show a high degree of the unidimensionality, convergent validity, discriminant validity, and reliability. A number of statistically significant pathways are confirmed between privacy concerns and other constructs, with satisfactory fit indices for both the measurement and structural model. Finally, the overall proposed model is evaluated as presented in chapter 5.

The First Question

"Why cloud based e-learning users are concerned about the information privacy?" This question is answered by a systematic literature search on information privacy concerns in cloud computing. The main academic databases are used to extract relevant literature such as IEEE, Science Direct, ACM, Springer, Scopus, and the search engine Google Scholar. This research has identified the potential information privacy issues which may affect on the information privacy concerns of cloud based e-learning users. The most common information privacy issues in the literature that cloud computer users concerns about are (Collection, Control, Awareness, Access, Storage, Retention, Destruction, Compliance, privacy Breaches and, Audit and Monitoring).

The Second Question

"How significant are these factors (i.e. Collection, Control, Awareness, Access, Storage, Retention, Destruction, Compliance, privacy Breaches and, Audit and Monitoring) in influencing information privacy of cloud based e-learning users?" This is answered through proposed.

The research hypothesises, which are empirically tested to determine the significance and direction of the relationships that exist between information privacy concerns in cloud-based e-learning. Each of the following factors: control, awareness, access, compliance, storage, retention, audit and monitoring, destruction, privacy breaches, risk beliefs, and trust beliefs. The result and discussion of hypothesises findings are explained in chapter five.

The Third Question

"How to validate the information privacy framework of cloud based e-learning users?" This is answered through proposed the research framework with the guide. The information privacy framework of cloud based e-learning users is constructed based on the Social Contract Theory as well as Internet Users Information Privacy Concerns framework (IUIPC) (Malhotra et al., 2004) based on a broad literature review that has identified the information privacy issues of cloud computing. The research framework and the research framework guides are validated by a panel of experts. The validity result by the panel expert is positive with regards to appropriately, easy to understandable, usability, sufficiently, clarity of research framework and research framework guides.

6.2 Research Contributions

This research has contributed to the knowledge and practical domain as discussed below.

6.2.1 Theoretical Contribution

The theoretical contribution is divided into three parts: Users' Information Privacy of Cloud Based E-Learning Framework, Assessment Tool (Instrument) and Methodology.

- Cloud Based E-Learning Users' Information Privacy Framework

Drawing on IUIPC framework and Social Contract Theory, this research offers a theoretical framework to explain the cloud based e-learning users for information privacy. It suggests that the proposed framework will serve as a useful tool for analyzing user' information concerns to various information privacy issues on the cloud-based e-learning system.

This study also examines the relationships between each construct of framework, which will allow for a detailed and deeper understanding of the information privacy in cloud based e-learning context. However, to the best of our knowledge, this thesis is the first comprehensive and systematic work proposing an information privacy framework of cloud-based e-learning to reduce the information privacy concerns.

- Assessment Tool (Instrument)

This research contributes to the information privacy domain by providing assessment tool (Instrument) to assess information privacy in the cloud based e-learning system. The findings confirm that the measurement item satisfies the reliability and

validity and clarifies by EFA in the public university in Malaysia which could be used for further research. The instrument designing is based on the findings from the extended literature review with a particular focus on information privacy concerns of cloud computing.

- Methodology

By using quantitative survey, the measurement items of the study constructs are identified by rigorous statistical testing to check validity and reliability, although, some items and construct are deleted from the conceptual model in the instrument validation process. The results show that there is a high degree of construct validity, reliability, and discriminant validity for each of the constructs within the framework. In addition, satisfactory fit indices with significant pathways in the hypothesized direction between the theorized constructs are evident. This research explains how to validate instrument and framework are developed.

6.2.2 Industry Contribution

The Industry contribution is divided into two parts: Education Industry and Cloud Computing Industry

- Education Industry

The proposed framework and instrument in this research can be used by educational institutions which adopt cloud based e-learning system to reduce the cloud computing barrier, and to set out the basis that we argue will help to address the information privacy situation of the educational institutions. Moreover, the proposed framework and instrument allow the educational institution to overcome the urgent need of ensuring the information privacy. The findings of this study will also assist educational

institutions with more practical guidance on considering particular information privacy factors.

This study provides some guidance to the educational institutions that will implement cloud based e-learning in the near future and to encourage them to adopt cloud based e-learning system. We argue the findings of this research are expected to assist educational institutions to evaluate possible adoption and increase their awareness about information privacy issues.

- Cloud Computing Industry

It is essential for the adoption of cloud computing that users are reassured that privacy is not compromised. Information privacy is a central part of creating the trust that underpins adoption of cloud computing. In this research, we argue that the proposed framework will be a step forward to increase the level of trust between users and cloud service providers. The CSPs would be able to design cloud based e-learning system with more respect of users' information privacy.

6.2.3 Policy Contribution

The study is in parallel with the growing importance of effective policies and regulation that govern the data in the cloud computing. Thus, this study provides an important base for policy-makers in order to improve the legal rights and liabilities of cloud computing services and their users.

6.3 Limitations and Future Works

The limitation of this study is because there is one university in Malaysia adopts cloud based e-learning which the Universiti Pendidikan Sultan Idris (UPSI) is. This study is conducted in the UPSI and the result may be generalized to other universities in Malaysia. In addition, the sample size is relatively small. It might be useful to increase the

number of respondents as privacy concerns might be sensitive to sample size. Hence, it would be interesting to refine the framework further and examine the generalizability of the framework.

This research is based on the context of emerging and developing technology which is cloud computing. Both, users' concerns and beliefs could be changed over time. Although there are many studies that have used information privacy concerns theories and models over extended periods of time, it might be interesting to explore this issue in future researches.

Conduct an action study where an educational institution that needs to implement the information privacy framework of cloud based e-learning system. Such researches would help to extend the proposed framework to include actual implementation steps.

The gender, qualification level, and job titles are included which are commonly used variables in statistical investigations in order to investigate any bias in the sample. The demographic questions are not a part of the proposed framework. However, it would be interesting to fit these demographic as moderators into the research framework and it could provide further analyzing options in future work such as comparing these variables to other variables to discover some interesting correlations.

6.4 Conclusion

Research problem focuses on the user information privacy of cloud based e-learning. This study represents the empirical study of information privacy in cloud based e-learning. The research adopted quantitative approaches to obtain and analyze the information. A systematic search is performed to the literature that considers privacy concerns, eleven factors are identified in the literature. The quantitative method allows the development of a theoretical framework using a survey questionnaire technique. A questionnaire is developed based on the reviewed literature. The results indicate that the questionnaire has the ability to be a valid and reliable instrument for measurement of

cloud based e-learning users' information privacy concerns. Based on the research model 32 hypothesis is proposed for direct and indirect effect. The main study was conducted with 216 participants. The population target of this research is the academic staff and staff of ICT center in UPSI as they have experience on e-learning. In total, 216 questionnaires are returned out of 223, which represent a response rate of 96.86% of the original sample. The quantitative data is analyzed using Statistical Package for the Social Sciences (SPSS) version 22 and Analysis of Moment Structures (AMOS) version 23.

Then, the items are clarified by exploratory factor analysis. The results from the exploratory factor analysis are measured again by confirmatory factor analysis. The structural model and the research hypotheses are tested. The result shows the constructs of the research show a high degree of the unidimensionality, convergent validity, discriminant validity, and reliability. A number of statistically significant pathways were confirmed between privacy concerns and other constructs, with satisfactory fit indices for both the measurement and structural model.