Chapter 5

Conclusions and Discussion

5.1 Conclusions

In this research, alternative financial system for small enterprises in Thailand under cloud computing architecture was studied. The two main research objectives were to examine and analyze the obstacles of small and medium-sized enterprises from a financial perspective, and to explore and propose solutions to knowledge management for small and medium-sized enterprises to solve financial problems.

There were 3 groups of population. The first group of population was SMEs operators in Bangkok and its vicinity. They were entrepreneurs who participated in New Entrepreneurs Creation Project in coordination with the Department of Industrial Promotion. The population of this research consisted of 480 SMEs owners in total. The criteria for the selection of samples were the samples aged below 40 years old and the business successors. There were 94 SMEs owners. 20 samples were selected by the researchers(p.p.14-15). The second group of population the samples who had knowledge of finance. 5 samples were selected based on the criteria of entrepreneurs who participated in New Entrepreneurs Creation Project. 5 samples were selected from credit officers from financial institutions. 5 samples were selected from financial advisors. There were then 15 samples in total. The last group of population was SEs operators in Bangkok and its vicinity who participated in New Entrepreneurs Creation Project in coordination with Department of Industrial Promotion. The total population was 457. The criteria for the selection were the samples aged below 40 years old the samples who graduated with MBA and the samples who were IT knowledgeable and the business successors. There were 62 SEs owners. The researchers finally selected 50 samples in total. The population in this study is the population from the third group of samples, totaling 10 cases. Each sample was interviewed and observed for 3 different sessions. To collect data in this research, three types of instruments consisted of questionnaire, interviews, and observation issues. The data were collected using

questionnaires. The purpose was to collect data about the attitudes of SME entrepreneurs towards financial information. The questionnaires were used with the samples in the first year project (pp.14-15). The data were collected through the interviews using the tools called left hand column for the preparation of the interviews. The interviews were divided into two sets. The first set was used to interview the samples with knowledge of finance, including the entrepreneurs who used financial information in analysis and decisions, banking credit officers, and financial advisors. The objective was to obtain good financial model as the interviews explored the opinions of effective financial information (Appendix C). In the second set, the interviews were conducted with 50 SME operators to collect data on the behaviors of financial practice and attitudes. The interviews consisted of two parts. To collect data in this stage, interviews and observation were used (Appendix E). The objective was to collect data concerning behaviors towards cloud computing finance system.

For research methods, questionnaires were used to collect basic data. Interview and Observation was utilized to collect data regarding the behaviors towards Cloud computing finance. Tools for knowledge management used in this research included CommonKads, left hand column, ladder of inference, Balance inquiry & advocacy, Theories of behavior change, and cloud computing architecture. This research found that the entrepreneurs of SEs who had MBA with IT knowledge and were classified as the new generation were likely to accept a new challenge. Yet they were not paying any attention to the financial information and hardly used the information for making decisions. This was a result from their mental model. Ladder of inference was, therefore, applied to analyze the mental model and theories of behavior change were adopted to adjust the behaviors involved in each stage of the financial ladder of inference of the entrepreneurs of SEs. The adjusted patterns obtained from the adjustment of mental model were which later considered. From the literature review, the cloud computing shows its potential to solve the relevant problems. Therefore, the cloud computing will be applied as a solution tool. When analyzing the problems and applying the tools for adjusting the mental model, the certain issues are concerned with the analysis and presentation of the relationship between the perception of financial information and the mental model for creating cloud computing architecture.

The following methodology has been proposed in this research:

1. CommonKads is used for capturing the knowledge in terms of the knowledge structure of Task, Inference, and Domain.

2. Left hand column is employed design questions about how the financial information was used in the decision process of SEs.

3. Ladder of inference is utilized to construct the interview questions in order to identify the aspects of financial information in each step that relate to mental model.

4. Balance inquiry & advocacy analyzes the data obtained from the questions.

5. Theories of behavior change are employed to identify the key elements that result in the behavior change of the SEs entrepreneurs.

6. The financial ladder of inference is constructed using the analyzed information from the previous steps.

7. A new cloud computing architecture is designed on the financial ladder of inference.

8. The cloud computing finance is implemented according to the determined cloud computing architecture.

Based on the proposed solution methodology, the following results are obtained.

1. The problems in terms of perceiving the financial data can be solved by the developed mental model of the SEs entrepreneurs.

2. The cloud computing architecture that facilitates the financial decisions is obtained.

3. An effective financial ladder of inference can be used as evidence when procuring loans from financial institutions. It can also be used as supporting data for government's projects such as the new enterprise project and capacity development project for industry competition through Information Technology.

4. It is expected that the results from this research can encourage the entrepreneurs of SEs to adjust their mental model in a way that the financial information is used for consideration and making decision. The failure rate of SMEs in Thailand can be reduced accordingly as they are capable of improving the operational results in a timely fashion, and thus sustain their enterprises.

5. Theories of behavior change can change the behavior of the SMEs entrepreneurs to use the cloud computing finance in their decision making process.

5.2 Discussion

This research can be discussed as follows:

5.2.1 It was found that in 2010, the small and medium enterprises constituted to 98% of the total enterprises. Figure 1.1 showed that many new small businesses were established every year, yet there was a certain number of businesses that faced the closure.

5.2.2 Most entrepreneurs of the small enterprises who were knowledgeable about finance did not include the financial information when making the decisions related to their business operation. Preliminary data indicated that the entrepreneurs of small enterprises who graduated with MBA, with the knowledge of IT, classified as the New Generation, hardly employed financial information in their decision-making process. Despite the initiatives of the government agencies, financial institutions, or related agencies were carried out to provide additional knowledge along with the training courses of accounting and finance, counseling, or financial programs, the entrepreneurs of small enterprises were not motivated to be more attentive to their financial information.

5.2.3 From related research studies on the financial solutions to SME, it was found that financial solutions were seen in the forms of loan release, provision of financial knowledge, promoting policies, and financial instrument. Yet, there were no research studies that focused on the solutions to the problems occurred from the mental model of entrepreneurs who did not consider the financial information when making decisions. It was evident that other measures or assistance could not minimize the financial problems that affected SME. This research proved that cloud computing financial model created by the financial ladder of inference would enable the entrepreneurs to consider the financial information when making the decisions and reduce the financial problems of the SME operators.

5.2.4 From other research relevant to financial behaviors, Dolan stated that financial behavioral change needs to start from internal thought, belief, attitude and objective of the people, so that they can increase their business effectiveness and financial capability. When creating the new reception of knowledge and optimizing the benefits are accomplished, change in their financial behavior can then be achieved

(Dolan and others, 2012). Based on preliminary analysis, SE owners do not care about their financial accounting information because of their mental model, which will be later, proved in the next research section. This research, however, employed financial ladder of inference to fix the financial problems for SME.

5.2.5 Employing the financial accounting information in decision-making process can help solving problems in terms of the business operational results. It was found that financial or accounting data were obtained from various activities of the enterprises. Financial accounting information also affected the economic system of the organizations in the future, as illustrated in Figure 2.1.

5.2.6 Whether the entrepreneurs of small enterprises employed the financial information in their decision-making process or not was contingent upon their mental model. Reviewing related literature showed that the behavioral changes in terms of finance began from the inner thoughts, beliefs, attitudes, and objectives of the individuals. These elements were believed to help optimizing their business and financial capabilities. When a set of new knowledge was created and the benefits of behavioral changes were emphasized, the entrepreneurs tended to become successful (Dolan, 2012). The preliminary analysis indicated that the entrepreneurs of small enterprises ignored the financial accounting data because of their Mental Model.

5.2.7 The creation of cloud computing architecture, which was based on the good financial ladder of inferences by generating revenue-expense (cash flow), income statement (profit / loss), and balance sheet that were all linked. From the financial analysis, it was found that all three components were crucial for small enterprises. If one component was absent, the decision-making process would be ineffective. Cloud computing architecture, then, had to connect all three components together to show the small enterprises that the financial analysis required all three components as each component tended to provide specific direction of solution. In short, cloud computing architecture expedited the decision-making process. It was obvious that once the entrepreneurs were able to access to one of the components of financial data, it was also possible that other components were available for access. With consistent and coherent financial data, the entrepreneurs of the small enterprises were supported to adjust their Mental model in regards to the financial information.

5.2.8 The entrepreneurs of small enterprises consulted their financial information only when the operational results of that particular aspect were problematic. To motivate the entrepreneurs to be more attentive to the financial information, certain stimulus had to be applied until they led to actual implementation. According to Table 4.7 and Table 4.8, it was obvious that the entrepreneurs of small enterprises did not consider the financial data when the business was in normal situation. The financial data would be consulted when the performances of the businesses were affected financially. Financial data in terms of Revenues and Expenses would be considered only when there were needs to make payment for suppliers, or there was not enough money for the transactions.

5.2.9 An effective financial cloud computing architecture can be obtained through

- Creation of effective financial model using Ladder of Inference to alter Mental Model
- Analysis and presentation of the relationship between perceptions of financial information and the development of Mental Model.

5.2.10 CommonKADs was an engineering knowledge management tool, which converted abstract knowledge to analytical and synthesizing knowledge consisting of the components of task, domain and Inference to provide more concrete evidence. This research integrated CommonKADs with Left hand column to create a query and applied with the ladder of inference as a tool for analysis and synthesis. CommonKADS was a tool designed for knowledge management and supported knowledge engineering. It was a process where abstract knowledge was converted into concrete knowledge facilitating the analysis and synthesis. CommonKADS consisted of two major parts; the task, and domain and inference. In this research, CommonKADS was used as a tool to capture critical knowledge of the management as it could support the analysis and thorough comprehension of the information.

5.2.11 From other related research studies on mental model such as a research on housing demand and the needs of babies (William and Brandt, 2013), analysis of the reactions from phone conversations (Howie, 2006), effective decisions of the pilots (Tompkins and Rhodes, 2012) and also from the results of this research, it was found that experiences, learning process, and beliefs of individuals had influences on their decision making process.

5.2.12 Processing of cloud computing continued to be developed from the initial idea. Virtualization and web services allowed the users to benefit from the services without requiring basic technical knowledge (Rajani, 2011). Therefore, the results of financial ladder of inference were incorporated in constructing cloud computing finance to solve the financial information beneficial for making decision.

5.2.13 Left hand column was a tool to understand the patterns of thinking and feeling of participation in the communication. This technique can be used to reflect the communication in the past or to prepare for future communications. The left column contained two sides of communication whereas the right column was the pattern of conversation of what would be trained. Left hand column was originally used in conversation. Yet, in this research, Left hand column was used to design the interviews to collect data concerning the behaviors of SE operators towards financial information. Left hand column had an advantage as the data concerning actual practice (on the right column) and the opinions or feelings of the entrepreneurs (on the left column) could be collected. From this research, it was found that actual practices and opinions or feelings were sometimes contradictory.

5.2.14 Mental model was naturally formed through attitudes and the creation of awareness. Attitudes, in this sense, indicated behaviors which were adjusted in accordance with internal and external circumstances. Attitudes were created by the perception from a source of information, feelings, emotions associated with a certain object, and past behaviors (Zanna and Rempel, 1988). Habit and routine were considered important factors that influenced human behaviors (Graybiel, 2008). In addition, the decision of each individual was potentially made based on the context and natural biases and mental shortcuts (Heuristics). Decisions were also the results of sub-consciousness, whether they were considered right or wrong. Frequently, decisions were made without consideration of the advantages or disadvantages, but rather the assumptions or conclusions drawn from individual understanding (Halpern and others, 2004). From the research, most SEs owners had studied MBA so they have studied some courses relating to financial accounting, but the research findings show that they do not take any consideration on the companies' financial information in their decision making. This is because most MBA courses only focus on financial tools but not on changing attitude in finance, although they know that financial data analysis is helpful

for the business's decision. Moreover, such short courses as KSME and NEC training for entrepreneurs aim and attempt to adjust the attitudes of SE owners by inviting well-known professionals who are successful in their businesses to present their business knowledge and concept, and to motivate people to see the benefits of using financial accounting information in their financial decision and analysis. However, such motivation can only last in a short-term. In order to change people's attitude, time is required to create trust. Although there are many financial accounting tools such as financial software, loan, knowledge distribution, and consultation, SMEs' entrepreneurs do not fully understand and show their interest in financial accounting.

5.2.15 William F. Brandt (2013) described the mental model by creating the ladder of inference with the people who would like to purchase houses and whose belief is based on the past information that the price has a tendency to be increased continuously and has no sign to be decreased. He found out that even though the price was gone up high with potential risks both in investment and interest, the purchasers were still willing to pay because of their purchasing desire. His paper also described about 'mother with baby' group. When a mother heard her baby's crying, it means for her that the baby needs help and the mother needs to come in and help. This is based on her experience, learning and information gained from other mothers. Peter Howie (2006) conducted a research about working with the ladder of inference by investigating on the reactions of the sample individuals' phone conversation, gestures, tones of voice, language intensity, language communication and expressions which are found to be varied among each individual and caused by different beliefs resulting in different practices. Tompkins and Rhodes (2012) researched about Groupthink and the Ladder of Inference: Increasing Effective Decision Making. They gave an example of the team from an aerospace company who worked with MBA students on different meanings of the word literature. These different meanings were based on different assumptions and from different definitions in order to create the same meaning and consistent conclusion. Finally, the professor had been the one who gave the most correct and effective meaning to avoid conflicts from contradictory assumptions in the team. Tompkins and Rhodes concluded that the ladder of inference could be used as a tool to create reliability in communication and influence executives and managers' decision making. The Ladder of inference was widely used by numerous researchers to analyze

the mental models in different fields of studies. And yet, it was not used in the financial perspective. When using the Ladder of inference to analyze the financial mental model, one advantage was found. That was, it had the capability to analyze the finance clearly and thoroughly. Most SE operators failed to analyze financial information because of their mental model. Once the mental model was changed, the financial behaviors would change accordingly.

5.2.16 Balance inquiry and advocacy was the tool that efficiently make a person reveal his/her thought. It could be used with other people for such a purpose too. The balance inquiry and advocacy that are balanced in both parts would have details as follows. The method could be explained thinking, give examples, seek other viewpoints, probed thinking, and encourage challenges (Isee System, 2012). Balance inquiry and advocacy was a tool mainly used in communication and conversation. However, this research employed balance inquiry and advocacy to analyze the data, which were later used to create cloud computing finance. The advantages were that it covered a wide range of aspects and even effectively supported the creation of cloud computing finance.

5.2.17 Knowledge management was a process of collecting, creating, organizing, sharing, and applying knowledge within the organization. The system was developed from data to information system with a purpose to accumulate knowledge and wisdom. Knowledge management consisted of a series of operations used by organizations in order to identify, create, display, and distribute knowledge for the benefits of the application and learning within the organizations, leading to more effective management of information system, which was vital for the operation of good businesses. Most large organizations usually had certain approaches to allocating resources for knowledge management, which were often included in a part of the information technology department or department of human resources management. The patterns of knowledge management were typically organized according to the objectives of the organization and aimed at achieving specific outcomes such as sharing wisdom, enhancing performances, gaining competitive advantages, or increasing the level of innovation (Wikipedia, 2013). Knowledge management referred to the process in which the operational personnel or sub-divisions of an organization performed together to create and apply knowledge in the work performance to achieve better

outcomes. In this sense, knowledge management was considered the activities of the operational personnel, not of the scholars or theorists. Yet, the scholars or theorists can be helpful as resource persons or facilitators of knowledge management (Davenport, 1994). Knowledge management in organizations was particularly significant for the organizations which were managed by horizontal administrative structure and network structure. The management at each level involved identifying or distinguishing reality or facts that can be used to help the team members to improve the performances, share information, and develop other related tasks (Gold and others, 2001). Knowledge management was a process of compiling and managing knowledge and expertise whether the knowledge was stored in computer, paper, or in persons. The aim was to enable personnel to gain knowledge and to exchange knowledge, which led to behavioral changes by increasing experiences and expertise (Amrit, 2000). Knowledge management was a critical process in this research. It contained many tools to help optimize each process and strengthen the effectiveness of people in organizations. Knowledge management was central in this research study, which included CommonKADS, mental model, left hand column, ladder of inference, Balance inquiry and advocacy. All these were used as tools to capture knowledge and to adjust working procedures of financial personnel. It was clear that each tool was capable of solving problems in each stage and supporting the research in terms of reliability and effectiveness.

5.2.18 As shown in other research supporting the solutions for SMEs, Mardikyan(2010) found that the rapid change in information technology (IT) requires entrepreneurs' adaption and development in IT, because IT development for SMEs can influence their decision and operation, and support the business success. In addition, IT system helps saving time, increasing effectiveness, reducing complication in data management, correctly and precisely evaluating and processing data, and effectively maintaining data. Mardikyan(2010) studied the solutions to problems of SME by incorporating IT to support the works of the organizations. This research, however, employed Cloud computing financial system to fix the financial problems for SME.

5.2.19 Zainal(2011) found that human resource management (HRM) has an important role in improving the production effectiveness, efficiency and survival of the organization by attracting, retaining and motivating employees to work and support

organizational operations, objectives and strategies in order to best achieve the organizational effectiveness and performance. Good HRM must be able to increase personal capabilities, and continuously and sustainably developing skills to increase the SMEs' effectiveness. Zainal(2011) studied the solutions to problems of SME by human resource management to support the works of the organizations. This research, however, employed Cloud computing financial system to fix the financial problems for SME.

5.2.20 Human behaviors were complex. Behavior change was a key target of government agencies, organizations, and communities. The most effective design of behavior change program should result in the actual changes of people's practices (Glanz and others, 1990). Human behaviors are influenced by various factors and individual behaviors are deeply embedded in society and institutions in different contexts and situations (Jackson, 2005). Behavior theories move away from were individual to focus either on behavior itself, or relationships between behavior, individuals and the social and physical environments in which they occur (Morris and others, 2012). Theory of behavior change explained why changes in behaviors were needed. It discussed personal environment and patterns of behaviors that were considered crucial factors influencing people's behaviors. Recently, this theory was significantly employed in health work, education, science, energy, and international developments, with the hope that the understanding would change behaviors in delivering services in the fields mentioned. (Wikipedia, 2013). Previously, certain researchers examined the Theory of behavior change in communication, dialogues, and standards of people in the organizations. This research, however, employed Theory of behavior change to adjust the negative mental model and to prevent errors in negative mental model.

5.2.21 Brown and others(2006) stated that business owners need to have financial knowledge since it helps them to work effectively and be capable to evaluate necessary information for their decision making. Managers also need to have financial knowledge. "Training in Business Basics" is software designed specifically for the business owners and managers of new startup SMEs. The objective is to support them in the first 3 years of operations. The software consists of all modules in 3 years, in each week via internet, supported by email and phone communication with assistants taking care of each

business, electronic library, as well as frequently asked questions for financial management knowledge. The results from the “Training in Business Basics” show that the SMEs’ demand level for financial knowledge is low. The confidence in understanding and analyzing necessary financial information may help them to comprehend their basic financial statement, but may not help them to utilize such financial information for their decision making. Brown and others(2006) studied the solutions to problems of SME by financial management knowledge to support the works of the organizations. This research, however, employed Cloud computing financial system to fix the financial problems for SME.

5.2.22 From other research relevant to financial behaviors, Dolan and others(2012) stated that financial behavioral change needs to start from internal thought, belief, attitude and objective of the people, so that they can increase their business effectiveness and financial capability. When creating the new reception of knowledge and optimizing the benefits are accomplished, change in their financial behavior can then be achieved . Based on preliminary analysis, SE owners do not care about their financial accounting information because of their mental model, which will be later, proved in the next research section. This research, however, employed financial ladder of inference to fix the financial problems for SME.

5.3 Recommendation

5.3.1 Recommendation from this research

This research could be beneficial for the development of related projects of study. The details were as follows

5.3.1.1 Ladder of inference should be extended to encompass the mental model of the SEs entrepreneurs with respect to other financial aspects. These include budget analysis, the breakeven point, the payback period, current net value, or investment rate of return.

5.3.1.2 Strategies for behavior change should be extended to the changes of mental model in respective aspects. The strategies for behavior change can be used as a tool to support the adjustment of mental model compatible to the afore-mentioned financial ladder of inference in each aspect

5.3.1.3 A more comprehensive cloud computing architecture in accordance with the extended financial ladder of inference should be implemented.

5.3.1.4 The financial information, when used in decision and analysis, could be beneficial for the enterprises in a way that the enterprises could solve financial problems in a timely manner and reduce the number of business closures.

5.3.2 Further research recommendation

This research could expanded for further research in the field of knowledge management. The details were as follows:

5.3.2.1 Extension of the proposed solution methodology in the research to other scales of enterprises. In this research, the cloud computing architecture is created for SEs. The cloud computing architecture is expected to be applicable to other medium-sized enterprises and large-sized enterprises on the condition that certain details have to be adjusted accordingly.

5.3.2.2 Behavior theories move away from the individual to focus either on behavior itself, or relationships between behavior, individuals and the social and physical environments in which they occur. Behavior change is a key target of government agencies, organizations, and communities. The most effective design of behavior change program should result in the actual changes of people's practices.

5.3.2.3 Cloud computing finance could be adapted to benefit different projects of the government. It supported the enterprises participated in the projects to be more financially viable and the financial information could be used in decision making.