5 Conclusion and Recommendations

This chapter provides an overall conclusion on the findings of this research based on the calculations and analysis in the previous chapter. This presents answers to the research questions/objectives and the research conclusion.

5.1 Conclusion

5.1.1 Key Risks in Software Project Management

Based on the findings in the previous chapter, it would be clear that requirement/scope and client/stakeholders were the main internal risk sources in software project management. For them the risk item "Software project's scope is not firm and keeps expanding" has resulted the highest mean risk factor value. Hence it was identified as the most prioritized risk item in this research. Central tendency of risk factor results, the distribution/spread of risk factor values, and the skewness supported the decision. Therefore the researcher believes that a large number of participants favoured "Software project's scope is not firm and keeps expanding" as the key risk item.

Risk item "A significant number of unspoken project requirements exist" scored the second highest risk factor mean value. Considering the central tendency of risk factor results, the distribution/spread of risk factor values, and the skewness, it was identified as the second key risk item in the research. Researcher has identified "No adequate time is allocated to clearly define the project requirements" as the third key risk item in the research. The prioritized list of risks is shown in the Appendix C.

This research's scope was limited to a selected set of internal risk sources. The produced results of this research represented summary of evidence on the state of project manager's and team lead's perception of the tested risk items. Measured values of probability and impact reduced the error that could occur due to participant's risk utility. Availability of contingency plans and their

effectiveness might influence some of the measured impact values. Due to the limited sample and the method that used to determine the sample, caution is advised in making wider conclusion. Responses were measured on five-point Likert scale, of probability "0.01= Very low" through "0.5= Very high" and impact "0.1= No impact" through "0.9 = Complete failure". Questions were raised on the process for analyzing the results of a sample data with Likert scale. Special attention was made when determined the intervals that minimized the ambiguity.

5.1.2 Most Widely Used Risk Identification Methods

Based on the findings in the previous chapter, it was understood that "Use the past experience" is the most widely used risk identification method in this research. "Brainstorming" and "Expert judgment" became second and third in the findings. Critically analyzed results have shown a response pattern with participant's project management experience. Those who had less project management experience have chosen mainly the "Brainstorming" method and those who had more experience stepped for methods like "Use the past experience". Finding a relationship between responses and experience was out from the project objectives and scope. Therefore researcher did not further study or analyze it.

Table 4.24 illustrates (section 4.2.2) the categorized ranked one data with their respective years of project management experiences. There were very less responses (collectively less than 1%) for other methods like Delphi technique, interviews and so on. Methods like SWOT analysis or use of Fish-bone diagrams were not mentioned by the participants. One reason could be the tendency in software development industry to neglect importance of project risk management (William and Young, 2000). Use of more ad-hoc methods or not use them at all could be another reasons.

5.1.3 Other Findings

It was also concluded that Scope management, a project management function, ranked as the most important functions. Time management, human resource management, quality management were next in the list. Key risks identification in the section 5.1.1 shows that identified key risks with highest risk factor values are categorized into schedule (time management) and scope/requirement

(scope management). Researcher did not analyze further to test possible relationships with key risk and important project management functions as it was out of project scope and the given time frame did not permit to analyze all possible scenarios.

Based on the findings in the risk management exposure, it was noted that "Risk need to be identified beforehand and mitigation plan and contingency plan to be prepared accordingly" was the most important risk exposure item in this research. This shows that regardless of an individual's risk utility, risk identification, contingencies and mitigation preparation should happen beforehand. Relatively higher responses were made on "Client's positive perception towards a software project is must for project success" as participants believed that client/stakeholders acceptance is must for project success. Especially majority of implementation failures happened due to non-acceptance by clients/end users (Asanka, 2005). Furthermore participants believed that preparation of correct project estimations in terms of time, cost, and resources reduced project failure tendency. Finally appointing a team with the required technical capabilities was identified as another important factor for a project success.

5.2 Recommendations

The managerial implications that can be derived from this study are:
- Risks identification has to be done before they cause negative impacts to projects along with the preparation of contingencies and mitigation plans.
- Then identified risks can be prioritized using an analysis method like probability impact matrix.
- Responding to risk items can be done based on the risk utility of practitioner.
- Stakeholder/client acceptance is one of the key factors for success and therefore more attention needed to be paid on them.

5.3 Future Research

Researcher believes that the observations and findings will stimulate further research on risk management in Sri Lankan software industry. Since this research is based on the results from selected internal risk sources, it would be beneficial to explore other internal and external risk sources as well.

Analyzed results have shown a response pattern with participant's project management experience. Those who had less project management experience identified "Project schedule does not cater for unexpected events/situations" as the key risk item. Those who had more project management experience believed that "Software project's scope is not firm and keeps expanding" as the key risk item. As the most effective risk identification method, the less experienced project managers selected "Brainstorming" and the more experienced project managers selected "Use the past experience". Therefore a deeper study of the relationship between responses and experience is another area open for future research.

Deductive research approach is used by the researcher to build this research and it used predefined relationships between risk and impact. Therefore risk utility of participants was not considered when building the research methodology. But the risk utility of participants may influence some of the impact assessment decisions, because risk seekers go with higher risk for higher return. In this scenario they may treat associated impact as always low. Therefore researcher thinks finding a relationship between risk utility and responding to risk is another area open for future research.

The question coding matrices in this research were adopted from foreign researches and tested them in the Sri Lankan context. Therefore these matrices can be used for future risk management research in Sri Lanka.

Researcher sees the requirement to have a model or framework that can be utilized in risk management process of software projects in the Sri Lankan context. This is another research area open for those who are interested in risk management.