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MANAGING OF RISK IN CONSTRUCTION INDUSTRY DUE TO CURRENCY FLUCTUATION: A CASE OF APARTMENTS PROJECTS IN SRI LANKA

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ABSTRACT

Construction industry is one of the most competitive and demanding industry and is more vulnerable to risk and uncertainty than many of the other industries because of complexity of output. Construction projects are generally regarded as high-risk sector. One way to manage project risks better is to establish more accurate ways to identify the most important risks. However, the main focus of this research was to identify critical risks between contracting parties due to currency fluctuations. Luxury apartment developments have different special features that are extremely risk-related. Construction professionals have faced an active threat to handle the risks with acceptable management strategies in apartment projects. At present, there is a lack of understanding of management capabilities to handle the impacts of currency fluctuation, which when examined, are presented in isolation. This paper aims to fill the research gap by addressing the effect on the apartment construction business of currency fluctuations. The focus is on the management capabilities.

This study was carried out by a systematic review of risk and risk management literature to illustrate the fundamental principles. Data collections were carried out by mixed approach. Semi-structured interviews were used to find the expert opinions and existing practices to reduce risk of currency fluctuation. The questionnaires survey was carried out validation of the findings of the expert interviews. Further, expert interview finding was analysed by manual content analysis method. The questionnaires were validated using Relative Important Index (RII) by experts who are engaging with apartment construction industry.

As the final objective of the research is to find management strategies to manage the risk in construction industry due to currency fluctuation: A case of apartment projects in Sri Lanka. In practice, there are no standard strategy to manage the risk of currency fluctuation. According to findings of the research, four managerial areas and sub sectors were identified. Business management capabilities, Financial management capabilties, Project management capabilities and Technical capabilities are the identified managerial areas.

Keywords: Risk Management, Currency Fluctuation, Apartment Construction, Management Capabilities

1.0 INTRODUCTION

The word ‘risk’ carries different meanings and is often used in many ways. It could be used to express uncertainty or hazard, or the possibility of meeting danger or suffering some loss (Jha, Neeraj, & Deveya, 2008). N.A.Kartam and Kartam (2001) defined risk as the probability of occurrence of some uncertain, unpredictable and even undesirable events that would change the prospects for the profitability on given investment. Physical, environmental, design, logistics, financial, legal, political, construction and operation risks are the different types of risks associated with the construction activities.

Construction is far more risky compared to other industries (Flanagan & Norman, 1993). Risk is more important for the construction sector since construction projects are always unique and risks arise from a number of different sources and these risks affect project in terms of cost, quality, duration and safety (Poh & Tah, 2006). The construction industry has a major tend in challenging businesses since it is riskiest and challenging sector. However, construction industry has a very poor reputation for engaging with risk (Mills, 2001). Mostly in construction industry, they ignore the risk or it covered by adding a contingency to recover the risk. As a result of that, most of the major projects fail to achieve scheduled deadlines and cost targets. It affects all parties involving in the construction projects. Hence, the risk management must be predominant since the construction projects become more unpredictable and complex, then the risk management must be prioritized. This affect in different levels of projects through massive expenditure, unbalanced cash flows, complex provisions of contract, economic uncertainty and new technology (Kangari & Riggs, 1989).

In the national economy and the economic development of each country the construction industry plays up a major role. The construction industry is a major sector in developing countries that provides new infrastructure in the form of highways, railways, airports and construction projects (Dakhil, 2013).

According to the economic theories, currency fluctuation will lead to changes in economic balance. The basic arguments of the currency fluctuation will depend on between demand for experts and imports. Appreciation of the domestic currency will increase when changes in the exports price and import price (Chadee & Crow, 1997). The fluctuation of currency can have a major impact on the country and its economy (Jasinthan, Laheetharan, & Satkunanathan, 2015).

Currency fluctuation leads to lack of confidence in the economy and instability of the economy (Jayasuriya & Perera, 2018). Construction industry is a major sector of the economy (Ramachandra & Zainudeen, 2006). According to these reasons, the currency fluctuation makes impact on the apartment construction. It seems evident that the lack of investigation in to impact of currency fluctuation in apartment projects in Sri Lanka. This research has been given how to manage the risk in apartment projects due to the currency fluctuation.

Hence, this study aims to find management strategies to manage the risk in construction industry due to currency fluctuation: A case of Apartment projects in Sri Lanka. The following objectives have been set up as milestones to achieve this aim.

- Investigate the risk in construction industry.
- Identify the impact of currency fluctuation.
- Exploring impact of currency fluctuation on apartment projects.
- Proposing strategies to manage the impact of currency fluctuation on apartment projects.

2.0 LITERATURE REVIEW

2.1 CONCEPT OF RISK AND UNCERTAINTY

Risk and uncertainty are not the same (Knight, 1921). Further Knight discussed the simple dissimilarity between risk and uncertainty. The risk is something measurable in the sense that estimates can be made of the probabilities of the outcomes that means we know what future outcomes are possible. On the other hand, uncertainty is not quantifiable and the probabilities of the possible outcomes are not identified. Uncertainty as a key driver of risk but argue that managers are able to measure and change their exposure to risk through the development of prevention, mitigation and recovery strategies. Whilst these do not exclude uncertainty, they do enable managers to reduce the risks which might arise from uncertainty. Mills (2001) says, we can measure the impact of risk as the likelihood of a relevant event and its unwanted consequences or loss. He shows the impact of the risk by fallowing equation;

"Impact of Risk = Likelihood X Consequences"

2.2 RISK IN CONSTRUCTION PROJECTS

Construction industry is low profit margin industry. And also, high risky one (Jha & Devaya, 2008). Construction projects are unique, dynamic and specific from one another. Difference level and combination of risk are born as a result of that uniqueness. In this case, difference response is to be taken to mitigate that risk and their consequences (Wiguna & Scott, 2006).

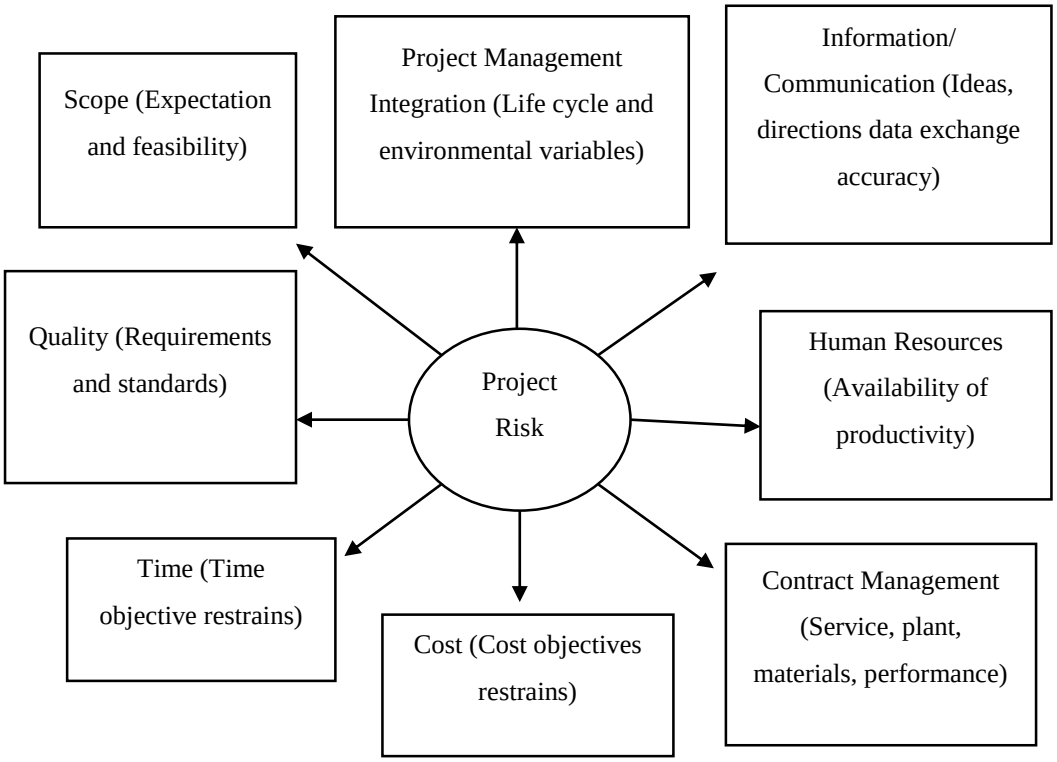

Figure 1: Impact risk on a project

2.3 RISK MANAGEMENT

Risk management can be defined as a structured process. It must be controlled process. Risk management must have stepwise path like every systematic process. Need of risk management is risen day by day in construction industry. Because of increasing complexity, scope, competition, client and customer requirements, political and economic changes (Oztas & Okmen, 2004). Proper framework must be created to risk management process. Setting goals and objectives, identifying and analysing decision marking and review risk response (Akintoye, 1994).

According to Minato & Ashley(1998) to definition of risk as fallows,

"Risk management is a quantitative systematic approach used to manage risks faced by project participants. It deals with both foreseeable as well as unforeseeable risks and the choice of the appropriate technique(s) for treating those risks." (Minato & Ashley, 1998).

2.4 RISK MANAGEMENT PROCESS

Using systematic path to managed the risk, it will be given proper assurance to the risk management process. Because of it mostly covered each factor and their affects to the risk (Chapman, 2001). According to Chapman (2001), risk management process may be describe in two stages, risk analysis and risk management. After risk analysis, direction of risk management system has headed to risk response. In risk analysis part consists with risk identification and risk assesent (Simu, 2006)

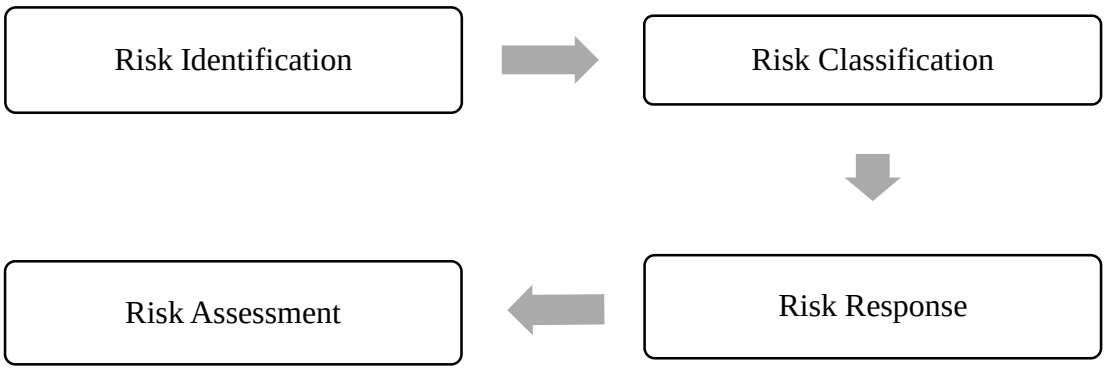

Figure 2: Process of risk management
Source: Zhi (1995)

3.0 FLUCTUATION OF CURRENCY

Exchange rate of currency means, the value of currency of country expressed by another countries currency. Another way to say it, the rate in local currency at when another currency to be exchange in local currency (Anlas, 2012). Exchange rate of currency is called as Currency Fluctuation. Depreciation of local currency is the major effect of the changes in FCEM. As a result of local currency depreciation, increase the prices of foreign goods comparable to local goods. But the good depreciation of currency can be diverting to replace local goods for foreign goods. It occurs higher competitiveness between domestic industries (Kandil, 2004).

3.1 IMPACT ON CONSTRUCTION INDUSTRY

Currency fluctuation is impacted to the construction industry from initial stage of the project. Preparing cost estimate was one key component of initial stage of every construction project. Currency fluctuation is critically important to this stage due to inflation. Effect on inflation has on materials, labour, equipment as well as services regard to project. Devaluation of currency is based on rate of inflation (Smirnov & Fedoseev, 2013). Throughout the history, inflation has been affected to current economic situation. In case of that, many construction material prices are fluctuated (del Puerto, 2011). Estimator must put allowances for inflation, as well as he must keep current pricing schedule of materials, and proper contact with suppliers and sub-contractors (Smirnov & Fedoseev, 2013).

3.2 IMPACT ON CONDOMINIUM PROPERTIES

Condominium is considered as one of the western living methods and it came from 1924 (Polgár & Szádeczky, 2017). Time by time, Eastern communities move to urban areas for their complex needs. Condominium property is one of the sub sector of real estate property development. Real estate sector is major key sector in economy (Prathapasinghe, Perera, & Ariyawansa, 2018). Reason of discussion about Concept of Condominium is, give a practical solution for urban housing needs. And also, issues of limited land in urban areas. Considering luxury condominium in Sri Lanka, several number of characteristics can define.

During past few years, condominium development has a boom in Colombo City due to high demand of apartment residencies. Colombo is the largest commercial city in Sri Lanka. Because of economic development of city is most significant thing to national economy (Ariyawansa & Udayanthika, 2012).

Condominium projects are one of the competitive markets of construction sector. Then most developers try to enter to the condominium market. Because of higher demand and high profit margin (Senaratne et al., 2006). According to Apartment Ownership Act 39 of 2003, the project was registered as a provisional condominium property by the developer (Authority, 2010).

4.0 METHODOLOGY

The mixed approach was chosen for the study according to the objectives of the research. The data of primary sources were considered as analysing materials. As data collection techniques for study, semi-structured interviews and the questionnaire survey are chosen.

Data collection was conducted through expert professionals in the apartment construction industry. Professionals who are working in both developer and contractor firms were selected as experts professionals for data collection.

4.1 DATA ANALYSIS METHODS

Data analysis includes examining, classifying, tabulating or otherwise recombining evidence to address the original intention of the research. Data analysis is the most important phase of the research. Because it gives the expected outcomes and fulfilled the objectives of the research with appropriate data collection method. Semi-structured interviews and a questionnaire survey were used to gather data for this research from industry experts. Therefore, content analysis and quantitative analysis have been used to analyse data and obtain accurate results.

- **Analysis of semi structured interviews**

Content analysis was the conducted to analyse semi structured interviews. Content analysis is one of the suitable methods for analysis the research which are in qualitative data. This method used to analysis the text data. Text data can be printed, verbal or electronic sources. This data collected from data collection methods which are in earlier said. Such as interviews, questionnaire and surveys (Hsieh & Shannon, 2005).

- **Analysis of questionnaire survey**

The Relative Important Index (RII) was selected to analyse the questionnaire survey. Many researchers have used it to determine the relative importance of attributes and to rank the attributes presented in the questionnaire (Tayalan, Bafail, Abdulaal, & Kabli, 2014). The RII equation was used ranked the managerial areas which are finding from semi structured interviews. Following equation is used to calculate the values of relevant managerial areas.

$$RII = \frac{\Sigma (W\ n)}{A \times N}$$

The symbols of the equation are followed;
W = Constant expressing the weighting given to each expert
N = Total Number in the Responsesz
A = The highest weighting of the factor
n = The frequency of responses

4.2 RESEARCH PROCESS

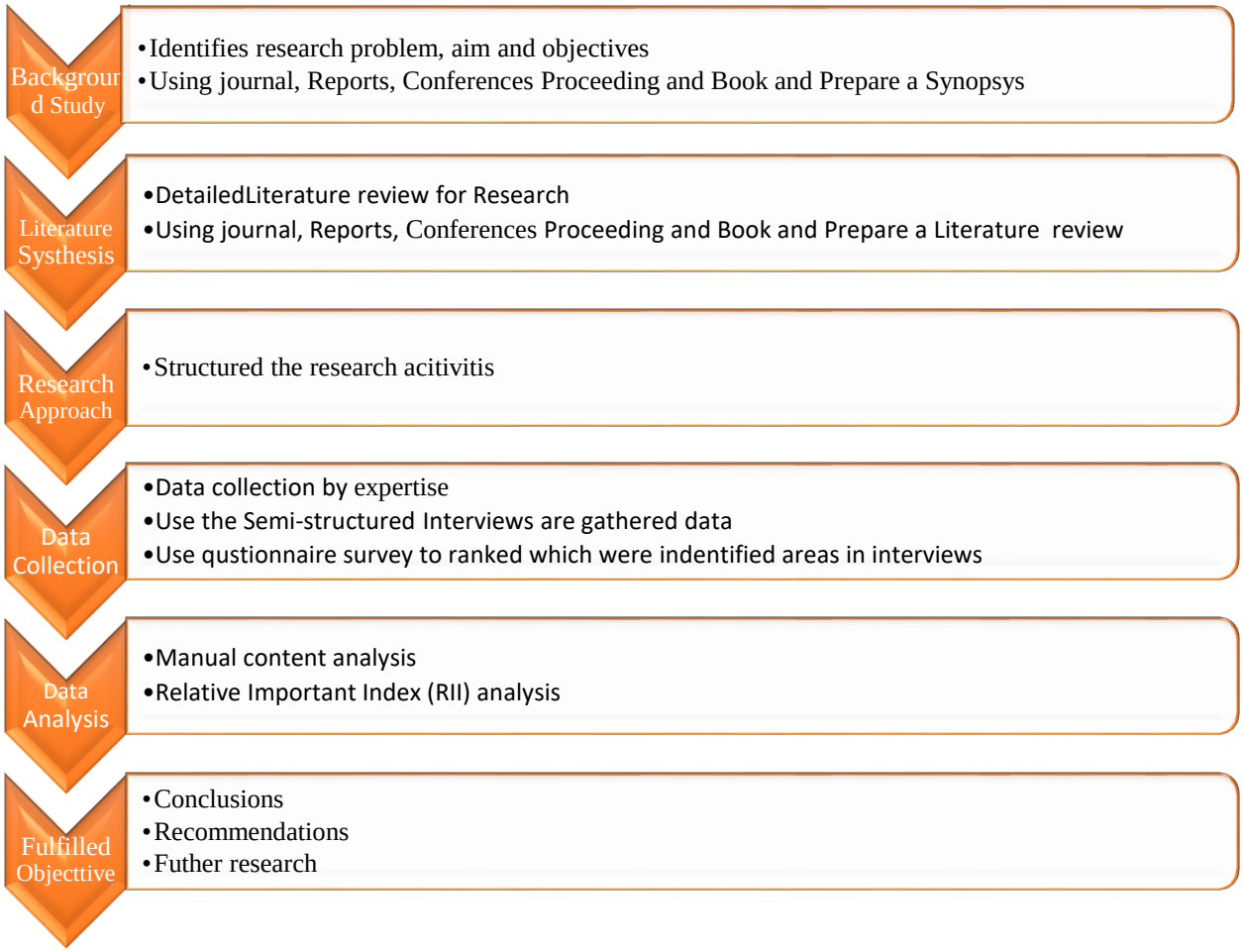

Figure 3: Research Process

5.0 ANALYSIS

5.1 FINDINGS AND ANALYSIS OF EXPERT INTERVIEWS

Semi-structured interviews between qualified experts who is engaging in the apartment industry were carried out as the initial stage of data collection. Both developer and contractor professionals were interviewed through the semi-structured interviews. The buyers were interviewed in the same manner as well. The interviews were conducted with the field experts according to the semi-structured guideline. Interview guideline was prepared by considering the evidence of the literature review and synopsis. Two guidelines were prepared separately for contractors and developers. All questions were open-ended questions to get more ideas from experts.

Table 1: Factors and managerial strategies to effects of currency fluctuation

Stages	Party	Factors to be considered	Managerial Strategies
Feasibility Study	Developer	• Demand of condominiums • Consider the selling prices • Drastically changes about foreign currencies	Consider the demand for condominiums in the area to be developed Infrastructures and other opportunities in the area to be developed Identify drastically changes in foreign exchange rates

Tendering Stage	Contractor	• Identify the price risks and Bear it to rates • Consider about the flow of currency fluctuation • Prediction about future changes in foreign currencies	Proper knowledge about the size and complexity of the project Procurement plan for imported materials Mange to reduce the project time period Negotiate with fixed prices with local material suppliers
Evaluation Stage	Developer	• Select proper contractor • Comply with organisation strategies about foreign currency fluctuations	Get BOI approvals for projects Selecting an experienced technical team The experienced staff at managerial level Selecting an experienced technical team
In agreement	Developer/Contractor	• Fixed the prices in BOQs • Negotiated with contractors about actions taking due to currency fluctuation	Improve the lending facilities to buyers Negotiate with fixed prices with local material suppliers
Pre-sales	Developer	• Buyer's responses • Marketing strategies	Improve the pre-sales capacity before the end of the construction phase
Construction Stage	Developer/Contractor	• Importing materials • Aline with project programme • Dealing with suppliers	Manage the contingencies for pricing risk and other risks Introduced value engineering concepts Using high technological technics to reduce the construction period Using foreign expert for specified tasks
Marketing	Developer	• Clause of the sales agreement • Finding of balanced capital • Security and safety	Conduct marketing activities in local and foreign countries Introduced attractable payment plans Ensuring security and safety
Accounting	Developer/Contractor	• Difficulties arise in exchanging foreign currencies • Lending facilities to buyers	Funding the capital by suitable procurement system Manage the cash flow and bank arrangements Conduct the accounts in US Dollars Manage bonds and insurances

5.2 ANALYSIS AND FINDINGS OF QUESTIONNAIRE SURVEY

The collection of data was completed by doing questionnaire survey as the final step of the data collection. It has been described under this phase. Preparation of the questionnaire was based on the findings of the literature review and the expert interview. According to the analysis of expert interviews and literature synthesis, four managerial areas and their sub sectors have been identified. The importance of these managerial levels was ranked by expertise who are engaging with apartment industry.

6.0 RESEARCH FINDINGS

Four managerial areas were identified by the findings of analysis phase. According to the major stages of the process, factors are identified that affected the project due to currency fluctuation. And also, managerial strategies have been listed in each stage

6.1 BUSINESS MANAGEMENT CAPABILITIES

Qualifications for business management are essential for construction organisations. Organisational structure, management skills and qualifications for management based on previous performance of the management staff. This includes the organisation's capacity to manage its resources; either direct or indirect.

- Identify drastically changes in foreign exchange rates
- Consider the demand of condos in area to be developed
- Infrastructure and other opportunities in area to be developed
- Conduct marketing activities in locally and foreign country
- Introduced attractable payment plans
- Ensuring security and safety

Table 2: Capabilities of business management

Rank	Capabilities	Overall RII
1	Experienced staff in managerial level	0.91
2	Consider the demand of condominiums in area to be developed	0.89
3	Identify drastically changes in foreign exchange rates	0.88
4	Ensuring security and safety	0.86
4	Infrastructures and other opportunities in area to be developed	0.86
5	Introduced attractable payment plans	0.81
5	Conduct marketing activities in locally and foreign countries	0.81

6.2 FINANCIAL MANAGEMENT CAPABILITIES

The financial elements must be considered by both development and contractor organizations which involved in the apartment industry, such as bonds, securities, contingencies, cash flow, and transaction costs. Those components are very important to the volatility in the currency. Strong financial capability is essential for the construction organisations. This ability is used by financial construction organizations to add value to the current business and at the same time reduce the impact of foreign currency.

- Funding the capital by suitable procurement system
- Manage the cash flow and bank arrangements
- Conduct the accounts in US Dollars
- Manage bonds and insurances
- Manage the contingencies for pricing risk and other risks
- Improve the lending facilities to buyers
- Improve the pre sales capacity before the end of the construction phase

Table 3: Capabilities of financial management

Rank	Capabilities	Overall RII
1	Funding the capital by suitable procurement system	0.91
2	Manage the cash flow and bank arrangements	0.87
3	Conduct the accounts in US Dollars	0.86
4	Manage bonds and insurances	0.82
5	Improve the lending facilities to buyers	0.81
6	Manage the contingencies for pricing risk and other risks	0.79
7	Improve the pre sales capacity before the end of the construction phase	0.77

6.3 PROJECT MANAGEMENT CAPABILITIES

Professional project management and construction effective construction technologies are two strategic assets used to enhance the building capacity. In creation of organisations requires the ability of design, organize, supervise, direct and manage the work requires in the creation of organizations. Ability of project management is critical for avoiding the abandon of construction project due to the fluctuations. If the contractor can complete the project within the project period.

- Proper knowledge about size and complexity of project
- Procurement plan for imported materials
- Get BOI approvals for projects
- Mange to reduce the project time period
- Negotiate with fixed prices with local material suppliers

Table 4: Capabilities of project management

Rank	Capabilities	Overall RII
1	Proper knowledge about size and complexity of project	0.90
2	Procurement plan for imported materials	0.89
3	Get BOI approvals for projects	0.81
3	Mange to reduce the project time period	0.81
4	Negotiate with fixed prices with local material suppliers	0.74

6.4 TECHNICAL CAPABILITIES

One of the necessary factors for construction organisations is to be competitive in apartment projects is technical capability. It is rooted in the perspectives of the project team and key staff. This capacity is referred to as a company's ability to undertake and carry out a variety of direct construction activities by defining the type, size and complexity to complete.

- Selecting experienced technical team
- Introduced value engineering concepts
- Using high technological technics to reduce construction period
- Using foreign expert for specified tasks

Table 5: Capabilities of technical management

Rank	Capabilities	Overall RII
1	Selecting experienced technical team	0.89
2	Introduced value engineering concepts	0.88
3	Using high technological technics to reduce construction period	0.67
4	Using foreign expert for specified tasks	0.57

Then questionnaire survey was conducted to validate that findings by experts in industry.

7.0 CONCLUSION

In the literature survey, risk management was critically reviewed and seven risk areas, which are project management, information and communication management, human resource management, contract management, cost management, time management, quality management were determined through the literature survey. The findings of the literature survey provided a basic understanding of what currency fluctuation is, how it affects the economy of the country, and the risk management aspects of it. The above issues were discussed under this objective. It then highlighted the main points and areas and referred them to the interview guide for expert interviews.

The factors affecting the demand and supply of condominiums were identified through the literature survey, such as individual income, demographic factors, tax rates and expected prices. Eight stages from initiation to the handing over phase were identified in the analysis phase with the support of expert opinions. According to the identified eight (8) stages, four (4) managerial areas were identified by the analysis of the expert opinions. The detailed questionnaire survey was conducted to validate identified strategies by experts who have involved in apartment construction projects. Then identified strategies were ranked analysing the detailed questionnaire findings. It was helped to develop a hierarchy of strategies based on their importance.

In current practice, there are no standard strategies to manage the risk of currency fluctuation. But it is a critical risk to apartment construction projects. Rates of foreign currencies are controlled by the Central Bank of Sri Lanka and the economic process of the country. It is based on secure the economical balance net foreign exchange reserve of the country. As such construction experts involve in apartment developers and contractors must minimize their financial risk. Adoption suitable management strategies based on business management capabilities, financial management capabilities, project management capabilities and technical capabilities.

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