CAUSES AND EFFECTS OF ABUSES IN A FEASIBILITY STUDY: A STUDY IN MALAYSIAN CONSTRUCTION INDUSTRY

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Report submitted in partial fulfillment of the requirement for the award of the degree of Bachelor of Project Management with Honors

Faculty of Technology

UNIVERSITI MALAYSIA PAHANG

DECEMBER 2013

UNIVERSITI MALAYSIA PAHANG

CENTER FOR FRADUATE STUDIES

We certify that the thesis entitled "Causes and Effects of Abuses in a Feasibility study: A Study in Malaysian Construction Industry" is written by Fong Woan Shiuan. We have examined the final copy of this thesis and in our opinion; it is fully adequate in terms of scope and quality for the award of the degree of Bachelor in Project Management with Hons. We herewith recommend that it be accepted in fulfillment of the requirements for the degree of Bachelor in Project Management with Hons.

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I hereby declare that the work in this thesis is my own except for quotations and summaries which have been duly acknowledged. The thesis has not been accepted by any degree and is not concurrently submitted for award of other degree.

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Dedicated to my family and friends

ACKNOWLEDGEMENT

Without the help and support of a number of people it would not have been possible to complete this research. In particular, I wish to express my sincere appreciation to my thesis supervisor, Mr. Lee Chia Kuang, for his germinal ideas, invaluable guidance, continuous encouragement and constant support in making this research possible. He has always impressed me with his outstanding professional knowledge.

In addition to that, I would also like to express my gratitude to all my respondents for their kind cooperation during the data collection stage. My sincere appreciation extends to my course mates and friends who have provided assistance at various occasions. Finally, I am grateful for all the supports and motivations given by my family members.

ABSTRACT

Feasibility study is essential to be carried out at the early stage of project life cycle before entering into actual construction works. However, there are abuses of feasibility study occurred in construction industry in which this issue is seldom being given attention by the developers. Hence, there are four objectives in this research that aims to be achieved, which include to identify the causes of abuses of feasibility study in construction industry, to determine the effects of abuses of feasibility study in construction industry, to highlight the types of abuses occurred in feasibility study in construction industry, and to examine the relationship between the causes and effects of abuses of feasibility study in construction industry. The respondents of this research are developers who are the REHDA (Real Estate and Housing Developers' Association) members in Johor, Malaysia. The research data are collected by using postal questionnaires to 109 developers in Johor, Malaysia. Statistical analysis is used for data analysis in this research. For achieving first three research objectives, mean frequencies are used, whereas for achieving the fourth research objective, Pearson correlation is used. The results of data analysis showed that there are occurrences of abuses of feasibility study where types of abuses occurred in feasibility study, causes and effects of abuses of feasibility study in construction industry are determined and ranked according to their mean frequencies. In addition, the findings of this research also showed that there are positive and significant relationships between the causes and effects of abuses of feasibility study. As conclusion, the developers and project team should aware of the issue of abuses of feasibility study in construction industry. Besides that, the developers and project team should also alert to the causes of abuses of feasibility study in order to avoid from suffering of bearing the effects of abuses of feasibility study in construction industry.

ABSTRAK

Kajian kemungkinan adalah wajib untuk dilakukan sebelum satu pembinaan projek dimulakan. Walau bagaimanapun, terdapat kes penyalahgunaan kajian kemungkinan dalam industri pembinaan di mana isu ini kurang diberi perhatian dan dibincangkan oleh pemaju pembinaan. Oleh itu, terdapat empat tujuan dalam penjalanan kajian penyelidikan ini di mana ia merangkumi untuk mengetahui sebab-sebab berlakunya penyalahgunaan kajian kemungkinan dalam industri pembinaan, mengenal pasti kesan-kesan berlakunya penyalahgunaan kajian kemungkinan dalam industri pembinaan, menentukan jenis-jenis penyalahgunaan kajian kemungkinan berlaku dalam industri pembinaan, dan menganalisis hubungan antara sebab-sebab dan kesan-kesan berlakunya penyalahgunaan kajian kemungkinan dalam industri pembinaan. Responden-responden dalam kajian penyelidikan ini adalah pemaju pembinaan yang merupakan ahli-ahli institusi REHDA (Real Estate and Housing Developers' Association) di Johor, Malaysia. Data-data dikumpulkan melalui pengiriman kertas soal selidik kepada 109 pemaju pembinaan di Johor, Malaysia. Untuk menganalisis data, analisis statistik telah digunakan. Purata telah digunakan untuk mencapai tujuan pertama, tujuan kedua dan tujuan ketiga kajian penyelidikan ini. Selain itu, 'Pearson correlation' digunakan untuk mencapai tujuan keempat kajian penyelidikan, iaitu untuk menganalisis hubungan antara sebab-sebab dan kesan-kesan berlakunya penyalahgunaan kajian kemungkinan dalam industri pembinaan. Mengikut keputusan hasilnya proses analisis, isu penyalahgunaan kajian kemungkinan dalam industri pembinaan memang ada berlaku, hal ini disebabkan oleh pelbagai sebab dan kesan berlakunya penyalahgunaan kajian kemungkinan dalam industri pembinaan dikenal pasti dan disusun berdasarkan purata masing-masing. Selain itu, kajian penyelidikan ini juga mendapati sebab-sebab dan kesan-kesan berlakunya penyalahgunaan kajian kemungkinan dalam industri pembinaan adalah saling berkaitan di mana hubungan ini adalah positif dan ketara antara satu sama lain. Secara keseluruhannya, pemaju pembinaan seharusnya memberi perhatian yang secukupnya terhadap isu ini di mana isu ini akan mendatangkan kesan-kesan negatif sekiranya sebab-sebab berlakunya penyalahgunaan kajian kemungkinan dalam industri pembinaan tidak diketahui.

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LIST OF ABBREVIATIONS

BCR	Benefit-Cost Ratio
EOT	Extension of Time
IRR	Internal Rate of Return
NGOs	Non-Government Groups
NPV	Net Present Value
PP	Payback Period
REHDA	Real Estate and Housing Developers' Association
SPSS	Statistical Product and Service Solutions

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

This chapter is mainly to intro and describes the overall research. Firstly, problem background typically draws a brief picture of feasibility studies for the construction projects. On the other hands, the problem statement is mainly to detail out the reason of carrying out this research. Next, research objectives and research questions are also included in this chapter. These two elements are purposely to list out the objective of this research, and both of these two elements are closely related to each other. The next component that makes up this chapter is scope of the study, which is to determine the respondent involved and location of the research being carried out. Besides that, it also needs to describe why this research is important, which is written in the part of significance of the study. Last but not least, the operational definition and expected results are also included in this chapter.

1.2 BACKGROUND OF STUDY

In the construction industry, feasibility study becomes an essential element in which it needs to be conducted before each project to be carried out (Huh et al., 2012). Feasibility studies involve identifying and analyzing the strength and the weaknesses of the project, and at the same time, also determining the opportunity and threats outside the company within the construction industry. According to Hyari, K. and Kandil, A. (2009), feasibility studies are conducted mainly to determine and decide whether a project is profitable and realistically be achieved. Feasibility studies are normally evaluating the mutual benefits that can be earned and gained from the project (Abou-Zeid et al., 2007).

Before starting to work on a project, project manager needs to consider many things in order to achieve higher chances of success. Managers often face difficulties in making decision among various construction projects (Abou-Zeid et al., 2007). Thus, feasibility study is essential to ensure project to be delivered in the right time and correct condition.

Feasibility studies play important roles in conducting construction projects. The main reasons of carrying out feasibility study are to satisfy the customers' requirements and to ensure project success. This in turn will increase the productivity and profitability of the organization. Feasibility studies provide a detailed report on the every aspect of the project. Therefore, project management team can manage and handle the project in a more systematic way. Furthermore, feasibility studies also supply some possible solutions or suggestions in which the organization can provide for the customers.

1.3 PROBLEM STATEMENT

In general, feasibility study can be categorized as economical and accounting science in which it is a procedure which includes computing the profit and costs for every project, so that, with the calculations made, managers can make wise investment decisions (Abou-Zeid et al., 2007). With the presence of feasibility studies, the company will not spend any unnecessary money on the unprofitable projects. Good feasibility studies are one of the key elements towards project success (Mackenzie, W. and Cusworth, N., 2007).

Firstly, the topic of abuses of feasibility studies is less discussed before. However, in reality, there are abuses of feasibility studies occurred in some companies. According to Mackenzie, W. and Cusworth, N. (2007), the issues of abuses of feasibility studies are usually resulted from the misunderstanding of study phases and also having wrong concept of the objective of the feasibility studies. Abuses of feasibility studies contribute to some effects and negative results of project outcome.

Therefore, there is a need to carry out this research to investigate causes and effects of abuses of feasibility study in construction industry. There are many researchers had found out there are some problems occurring in conducting feasibility study (Mackenzie, W. and Cusworth, N., 2007; Hendrickson and Au, 1998; Thuy, L. M., 2011; Cushman et al., 2001), in which these problems will contribute to abuses of feasibility study. However, there is less research which particularly aims to identify the causes and effects of abuses of feasibility study in construction industry. Hence, there is a strong desire to carry out a research on causes and effects of abuses of feasibility study as well as the types of abuses occurred in feasibility study in Malaysian construction industry. In addition, this research also purposely to investigate the relationship between the causes and effects of abuses of feasibility study in construction industry. With the findings of this research, the developers

and project team will be more aware of the issues of abuses of feasibility study, in which will reduce the probability of project success (Otim et al., 2011).

1.4 RESEARCH OBJECTIVES

1. To identify the causes of abuses of feasibility study in construction industry.
2. To determine the effects of abuses of feasibility study in construction industry.
3. To highlight the types of abuses occurred in feasibility study in construction industry.
4. To examine the relationship between the causes and effects of abuses of feasibility study in construction industry.

1.5 RESEARCH QUESTIONS

1. What are the causes of abuses of feasibility study in construction industry?
2. What are the effects of abuses of feasibility study in construction industry?
3. What are the types of abuses occurred in feasibility study in construction industry?
4. What type of relationship between the causes and effects of abuses of feasibility study in construction industry?

1.6 SCOPE OF STUDY

This study focuses on the real estate and housing developers who have conducted feasibility studies in all kinds of construction project. The following are some details about the scope of the study.

1.6.1 Respondents of the Research

The chosen respondents are the developers who are the REHDA (Real Estate and Housing Developers' Association) members in Johor, Malaysia. This study involves the participation of 109 developers of all kinds of construction projects in Johor, Malaysia.

1.6.2 Location of the Research

This research will particularly focusing on Johor, Malaysia is mainly due to it is one of the more developed states in Malaysia. There is wide variety of construction projects carried out in Johor. In addition, there are high level of customers demand and needs in the construction industry. Moreover, Johor has high potential of development in the construction industry with the support from government.

1.6.3 Instrument Used in the Research

The instrument used to collect the data is questionnaire, which will be distributed by posting to each company. The questionnaire will be demonstrated in the form of closed-ended questions and likert-scale questions.

1.7 SIGNIFICANCE OF STUDY

While at present there is no solid evidence which shows that there are abuses of feasibility study in construction industry. Furthermore, the findings of this study are

important to help to determine the causes and effects of abuses of feasibility study, as well as the types of abuses occurred in feasibility study. Other than that, this study is also important to investigate whether there is positive correlation between the causes and effects of abuses of feasibility study. With the findings of this study, the developers will more aware of the issues of abuses of feasibility study. Moreover, this study can also be a reference for people in the future.

1.8 OPERATIONAL DEFINITION

1. $NPV = C_0 + \frac{C_t}{(1+r)^t}$

Where

C_0 = Initial investment/cash outflow of today

C = Cash inflows in the period of *t*

t = time period of the investment

r = "opportunity cost of capital"/ required rate of return

2. $Payback\ Period = \frac{Project\ \ costs}{Annual\ \ cash\ flows}$

3. $IRR = \sum_{t=0}^{T} \frac{CF\ (t)}{(1+d)^t} = 0$

   Where d = IRR is the internal rate of return corresponding to cash flow *CF (t).*

4. $Benefit - cost\ ratio = \frac{Cash\ flow}{Project\ \ investment}$

5. $Construction\ time =$
   $Practical\ Completion\ Date - Project\ Commencement\ Date$

6. $Speed\ of\ Construction\ = \frac{Gross\ Floor\ Area\ (m^2)}{Construction\ \ Time\ \left(^{days}/_{weeks}\right)}$

7. $Time\ Variation = \frac{Construction\ \ Time - Revised\ \ Contract\ \ Period}{Revised\ \ Contract\ \ Period} \times 100\%$
   Where Revised Contract Period = Original Contract Period + EOT

8. $s = X^2NP\ (1-P) \div d^2\ (N-1) +\ X^2P\ (1-P)$

   Where

   s = required sample size

   X^2 = the table value of chi-square for 1 degree of freedom at the desired confidence level (3.841)

   N = the population size

   P = the population proportion (assumed to be 0.50 since this would provide the maximum sample size)

   d = the degree of accuracy expressed as a proportion (0.05)

9. $mean = \frac{1}{n} \sum_{i=0}^{n} a_i$

10. $standard\ deviation, s = \sqrt{\frac{1}{N-1}\sum_{i=1}^{N}(x_i - \bar{x})^2}$

1.9 EXPECTED RESULT

After the study has been carried out, it is expected that the causes and effects of abuses of feasibility study in construction industry will be identified. In addition, it is also expected that the most common types of abuses occurred in feasibility study faced by company can be defined. Besides that, it is also expected that the relationship between the causes and effects of abuses of the feasibility studies in construction industry will be determined.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

A project is a temporary endeavor undertaken to achieve organizational goals, with a definite beginning and end period (PMBOK Guide 4th edition, 2008). Construction projects are characterized as complex, risky and involving large amount of investment cost. There are many kinds of construction projects, which include residential housing, institutional and commercial building, specialized industrial construction, and infrastructure and heavy construction. Different kinds of construction projects bring different potential and having various types of profitability to an organization.

According to El-Reedy, M. A. (2012), a feasibility study as an initial step which will set the goals of the project and evaluate the economic viability of the project as a whole. Well-experienced persons are responsible to conduct the feasibility studies, which are equipped with complete and accurate information.

Expert judgments are essential for an effective feasibility study. A group with the team members made up of architects, engineers, quantity surveyors, project planners, planning supervisors, town planning consultants, land surveyors, and geotechnical engineers are helpful to ensure a successful feasibility study (Chartered Institute of Building, 2010). With their skills and knowledge, the project success and organizational goals can be achieved with higher probability.

Although feasibility studies incur some costs, it will guarantee that the project bring some profits to a company. Feasibility study can be described in a report form, and this can be a reference to the client during the beginning of the project. Feasibility study will give confidence to the customers that the project is profitable and achievable (Chartered Institute of Building, 2010). Hence, feasibility study is an important and useful tool for the development of the construction projects.

2.2 DEFINITION OF FEASIBILITY STUDY

There is wide variety of ways to define a feasibility study. According to Hyari, K. and Kandil, A. (2009), feasibility studies are usually used to evaluate value of investments in construction projects. Feasibility studies help in supporting decisions which are closely related to the construction projects.

On the other hands, feasibility studies can be defined as primary assessment of the potential of the development of the construction projects, which are particularly focusing on technical and economics issues in order to minimize the probability of risk occurred throughout the project progress (Mackenzie, W. and Cusworth, N., 2007).

Besides that, Abou Zeid et al. (2007) stated that feasibility studies are reliable inspection and experiment that are mainly conducted due to make decisions which are aligned with profitability of different construction projects. With the feasibility studies, decision makers can compare various alternatives and make wise decisions.

Moreover, feasibility studies can also be said as a tool and technique used by project managers to determine the solutions or strategies to be taken in order to solve the constraints which exist within the project (Chartered Institute of Building, 2010). This is mainly to fulfill and achieve customers' requirements. Expert judgments are needed to make feasibility studies to be more effective.

In addition, according to Chitkara, K. K. (2002), feasibility study is an evaluation of the potential of the project by assessing various aspects of the project, which include technical, economic and financial feasibility. The feasibility study is useful for customer analysis.

Furthermore, feasibility studies as planning tools, which prioritize various projects and set timings to start the project in order to achieve organizational goals and objectives (Hendrickson and Au, 1998).

2.3 IMPORTANCE OF FEASIBILITY STUDY

Piotrowski and Rogers (2010) claimed that feasibility studies are required for all major commercial design projects. Feasibility studies are carried out to identify the goals and purpose of the project, aligned with economic factors, demographic analysis and other elements that are contributed to project success. Besides that, feasibility study is useful in

evaluating the successfulness of a project before the starting of the project. The feasibility study will be reviewed by the project owner, developer and property management team. They are responsible to identify and correct any changes that are occurred before the project begins.

According to Twort (2003), feasibility studies are more associated with investigating technical feasibility and project cost. The feasibility studies are usually focusing on determining different choices of the site location, project design and layout at the beginning of the process. Site investigation is an essential point for a project. It refers to whether the construction is suitable to be carried out at that particular location. So, this process will take a lot time and energy of team members. Improper site investigation will spend a large amount of construction cost at a later stage. In addition, the feasibility studies should be equipped with complete and correct information. Hence, the project needs and objectives can be met.

Feasibility studies are presented in the report form; they can be reference to the clients or customers (Chartered Institute of Building, 2010). The clients can refer to the feasibility study report about the project cost and scope. Through this way, they can be provided with the most updated information of the project. Moreover, the feasibility studies measure and quantify various alternatives whether the project is worth undertaking (Heldman et al., 2007). Feasibility studies evaluate the project values and decide whether the company wants to carry out that project or not. The project will be terminated or rejected if the results of the feasibility studies are negative.

Other than that, feasibility studies are also used to accelerate the acquirement of enough funds for the project development in a definite period (Mackenzie, W. and Cusworth, N., 2007). Feasibility studies also include the information about project cost

estimating, so the feasibility studies can be a forecast tool in the field of project cost and budget.

2.4 COMPONENTS OF FEASIBILITY STUDY

Many researchers had carry out research on investigating the components of feasibility study for the construction projects. They had found out that a feasibility study for the construction project should include the analysis and evaluation of technical, economic or financial, legal, operational, market, and scheduling aspect (Abou-Zeid et al., 2007; Hyari, K. and Kandil, A., 2009; Katimuneetorn, 2008).

2.4.1 Technical Aspect

According to Abou-Zeid et al. (2007), technical feasibility study focuses on the identifying and defining the resource capacity of the project, project type, complete design, and site location. Firstly, resource capacity of the project refers to availability of labor, material, and equipment (Mubarak, 2010; Kumari and Vikranth, 2012). Secondly, there are three major types of construction projects, which include residential construction, building construction (institutional and commercial), and industrial construction such as petroleum refineries, petroleum plants, power plants, steel mills (Badiru and Osisanya, 2013; Bennett, 2012). Thirdly, the complete design of the project should meet the following requirements: fulfill the requirement of the clients (Alarcon and Mardones, 1998); aligned with the project budget (Bramble and West, 1999); and meet any legal requirements or legislations which are set by the government (Hendrickson and Au, 1998). Last but not least, there are several elements needs to be considered for the preparation of construction site, which include legal access, visibility, traffic, size and types of vehicles, utility locations, and security of construction site (Sauter, 2010; Howes and Tan, 2003).

2.4.2 Economic/Financial Aspect

Economic or financial feasibility studies are mainly aim at determining the investment cost, financial schedule, resources and costs, and revenues or profits (Abou-Zeid et al., 2007). According to Hyari, K. and Kandil, A. (2009), there are some methods for evaluating the alternative project viability, which include Net Present Value (NPV), Payback Period, Internal Rate of Return (IRR), and benefit-cost analysis.

Table 2.1: Comparison between the evaluation methods in terms of financial

	Net Present Value (NPV)	**Benefit-Cost Ratio (BCR)**	**Internal Rate of Return (IRR)**	**Payback Period (PP)**
Author's Name	Schwalbe (2006); Modesti (2006); Mohapatra (2012)	Le and Nguyen (2007)	Brigham and Houston (2009); Arshad (2012)	Mohapatra (2012)
Calculation	PV revenue – PV cost	Cash flow/project investment	Percentage return on project investment	Project costs/ Annual cash flows
Neutral Result	NPV = 0	Ratio = 1.0	IRR = Cost of capital	Payback period = accepted length
If used to screen project or to select projects outright	NPV > Acceptable amount	Ratio > Acceptable amount	IRR > Acceptable amount	Payback period < Acceptable length
If used to compare projects	Higher NPV better	Higher ratio better	Higher IRR better	Shorter payback period better

2.4.3 Legal Aspect

For construction project, legal feasibility study is mainly evaluates the project details in terms of legal (Abou-Zeid et al., 2007; Chartered Institute of Building, 2010). In other words, legal feasibility studies are typically to investigate any legal issues that occurred throughout the life cycle of the project and subsequently influence the progress of the project. Besides that, the legal feasibility study is also to assess whether the project is aligned with the legal requirements (Katimuneetorn, 2008).

According to Loosemore (2003), government plays an important role in the legal part of construction projects, which have the major influences in environmental laws, codes of practice, labor laws, safety regulations, licensing, insurances and taxation laws. Thus, the main purpose of legal feasibility study is to evaluate whether the construction projects aligned with the legislative rules and regulations or not. If the project do not meets government standards, the probability of being chosen by the developers will be lower.

2.4.4 Operational Aspect

According to Jang et al. (2003), the construction industry takes greatest considerations on the daily operations of the project, which are mostly associated with operational decisions. Hence, operational aspect is one of the essential elements that need to be included in the feasibility study for construction projects. Operational feasibility study is to analyze the effectiveness of project team. There are two criteria that need to taken into consideration for operational feasibility study, which are selection of contractors (Huang, 2011), and availability of skilled labors (Hyari et al., 2010).

2.4.5 Market Study

The market study plays an important role in determining the feasibility of a construction project. According to Abou-Zeid et al. (2007), market study is to evaluate the supply chain management, customer demand, supply-demand analysis, and the project market share. For supply-chain management, Ho et al. (2007) assert that the quality of the construction projects can be improved by having well management in supplier relationship. Hence, it is necessary to have good relationship with the supplier for better financial return. Metri (2005) states that a good supplier chain management should meet the following requirements, which include less number of dependable subcontractors, reliance on supplier process control, strong interdependence of supplier and customer, purchasing policy, pay more attention on quality rather than cost, supplier quality control, and support from supplier in quality monitoring. Other than that, Metri (2005) also asserts that quality of materials will largely influence the customer satisfaction; therefore, there is a need to ensure the project team is cooperating with credible suppliers for obtaining high quality materials.

2.4.6 Scheduling Aspect

Scheduling feasibility is an assessment of how long the project to be completed (Katimuneetorn, 2008). Time constraint is one of the triple constraints (PMBOK Guide 4th edition, 2008). Hence, on time completion is one of the critical challenges faced by construction projects (Zhang et al., 2008).

Chan and Chan (2004) define three variations of on-time completion indicators. The following are the details of on-time completion indicators.

a. Construction Time is the absolute time that is calculated as the number of days/weeks from start on site to practical completion of the project. The formula of Construction Time is as expressed as in Eq. (2.1):

$$Construction\ time = Practical\ Completion\ Date - Project\ Commencement\ Date \quad (2.1)$$

b. Speed of Construction is the relative time, which is defined by gross floor area divided by the construction time. The formula of Speed of Construction is expressed as in Eq. (2.2):

$$Speed\ of\ Construction = \frac{Gross\ Floor\ Area\ (m^2)}{Construction\ \ Time\ (^{days}/_{weeks})} \quad (2.2)$$

c. Time variation is measured by the percentage of increase or decrease in the estimated project in days/weeks, discounting the effect of Extension of Time (EOT) granted by the client. The formula of Time Variation is expressed as in Eq. (2.3):

$$Time\ Variation = \frac{Construction\ \ Time - Revised\ \ Contract\ \ Period}{Revised\ \ Contract\ \ Period} \times 100\% \quad (2.3)$$

Where Revised Contract Period = Original Contract Period + EOT

2.5 ABUSES OF FEASIBILITY STUDY

Otim et al. (2011) states that one of the causes of project failure is improper feasibility study. Hence, there are many feasibility studies are abused in construction industry. According to Mackenzie, W. and Cusworth, N. (2007), there are many incidents

of abuses of feasibility studies in the construction industry. The following are the description of abuses of feasibility study in more detailed form.

2.6 TYPES OF ABUSES OCCURRED IN FEASIBILITY STUDY

Feasibility study in construction industry can be considered as being abused in many terms. According to Mackenzie, W. and Cusworth, N. (2007), the abuses of feasibility study can be arise from misleading use of feasibility study or deliberately fraudulent occurred in feasibility study, misunderstanding of study phases, and failure to undertake feasibility study that is fit for purpose.

2.6.1 Misleading Use of Feasibility Study

Most common type of abuses of feasibility study is misleading use of feasibility study (Mackenzie, W. and Cusworth, N., 2007). Misleading use of feasibility study can be further divided into four groups, which are developers do not follow proper procedure in carrying out feasibility study, deliberately fraudulent occurred in feasibility study, do not follow governmental rules and regulations, and ignoring some aspects of contractual requirement.

2.6.1.1 Do Not Carry Out Feasibility Study Properly

Shobhit Gupta (2012) states that developers do not carry out feasibility study properly will contribute to project failure. One of the reasons of improper feasibility study occurs is that lack of expertise in project team for carrying out feasibility study (Shobhit

Gupta, 2012). Because of lacking of expertise in project team, those team members who are less experienced cannot get advice from the person who has more experiences in conducting feasibility study. Besides that, inadequate expert persons in planning and estimating project cost, time and resource will also cause developers and project teams cannot carry out feasibility study in proper manner (Thuy, L. M., 2011).

2.6.1.2 Deliberately Fraudulent Occurred in Feasibility Study

During the stage of feasibility study, deliberately fraudulent can occur because of developers' desire to earn more profit. Developers wish to save cost of carrying out feasibility study; hence they will simply conduct feasibility study which will ignore some important components for analysis (Hendrickson and Au, 1998). In addition, some developers will use inferior tools and techniques in estimating project cost, time and resource (Shobhit Gupta, 2012). This in turn will produce low quality results which will contribute to project failure.

2.6.1.3 Do Not Follow Governmental Rules and Regulations

Some project team members misleading use feasibility study in the way of ignoring the legislative rules associated with construction project that have been set by the government. There are many governmental laws that need to be followed by the construction companies (Loosemore, 2003). Examples of legislative rules and regulations that require the companies to be obligated to obey include National Land Code 1965, the Town and Country Planning Act 1976, the Environmental Quality Act 1974, and the Street Drainage and Building Act 1974 (Awang, 1997). In addition, for every construction projects, the companies have to get approval for the building plan from the local authorities before starting the construction works (Sufian and Rahman, 2008). Furthermore, the

companies have to identify the land uses during the feasibility study phase since there are some lands are particularly for the religious uses, such as Muslim has specific right in Malaysia (Awang, 1997).

This will bring some negative impacts towards the company that performs the feasibility study, such as penalized in monetary terms, as well as late approval of governmental permit for carrying out construction works (Victorian Municipal Building Surveyors Group, 2005). These negative impacts will subsequently minimize the profitability of the company, and also damage the image and reputation of the company in construction industry.

2.6.1.4 Ignoring Some Aspects of Contractual Requirement

Abuses of feasibility study are also arising from project team members do not follow contractual requirement. The project team members will ignore some aspects of contractual requirement. This will bring disputes among contractual parties involved in the construction project, such as contractors (Jannadiaa et al., 2000). Disputes typically will occur due to errors in contract documentation. These errors are usually resulted from lack of knowledge, carelessness and negligence and purposely do it (Sinha and Wayal, 2013). Examples of errors in contract documentation include mistakes made by designers, and mistakes in calculations and detailing.

2.6.2 Misunderstanding of Study Phases

The abuses of feasibility studies are usually resulting form misunderstanding of the process or phase of feasibility studies (Mackenzie, W. and Cusworth, N., 2007). This consequently led to negative relationship between study expectations and project outcomes. If the project team does not have enough skills and knowledge about the progress of feasibility studies, they may carry out the feasibility studies in an incorrect pathway. This in turn will cause to produce inaccurate result, and thus project owner will make wrong investment decision. There are three phases for the process of feasibility study, which are conceptual or scoping study, prefeasibility study, and feasibility study (Mackenzie, W. and Cusworth, N., 2007; Hyari, K. and Kandil, A., 2009). Figure 2.1 shows the multistage in feasibility study process.

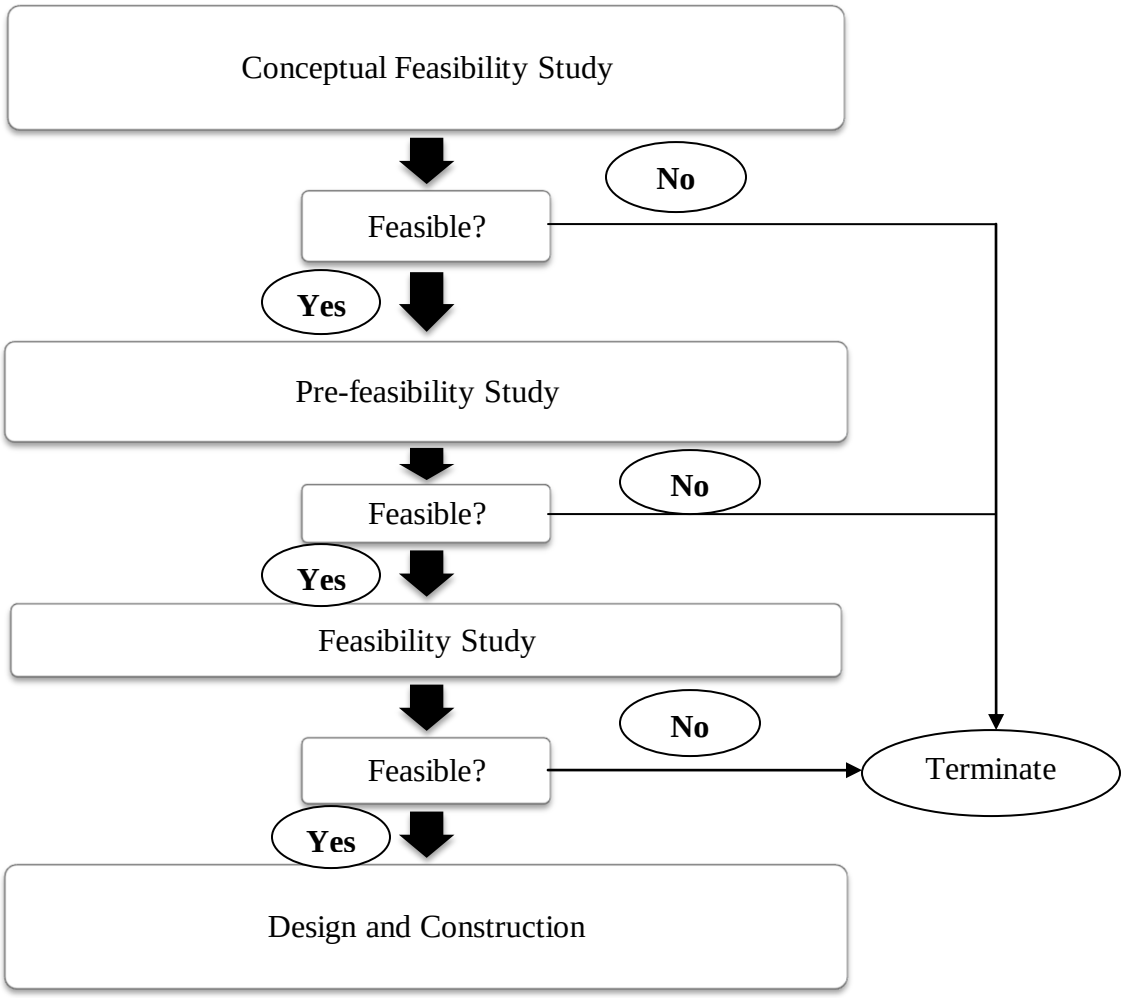

Figure 2.1: Multistage feasibility study

Source: Hyari, K. and Kandil, A. 2009. Validity of Feasibility Studies for Infrastructure Construction Projects

2.6.2.1 Conceptual/ Scoping Study (Phase 1)

Conceptual or scoping study is usually conducted at the early phase in which the project are just generated and defined (Hyari, K. and Kandil, A., 2009). There are many objectives of scoping study (Mackenzie, W. and Cusworth, N., 2007). The objectives of scoping study include evaluating the potential of new project, determining the characteristics of the project which will be investigated in more detailed form at next phase, identifying any possible opportunity and threat of project, defining the capital and operating cost, identifying the cost and time required for carrying out prefeasibility study, determining the technical aspects of project, defining the resources (human resources, materials and equipments) required for feasibility study and project, and preparing a report that includes recommendation for next study phases (to proceed or to terminate).

2.6.2.2 Prefeasibility Study (Phase 2)

Prefeasibility study is usually conducted after completion of first phase of feasibility study (scoping study), which is called as second evaluation (Hyari, K. and Kandil, A., 2009). According to Mackenzie, W. and Cusworth, N. (2007), there are many purposes of prefeasibility study. The purposes of prefeasibility study include evaluating the variability of the project in terms of technical and economical, investigating the characteristics of project in detail, developing risk profile of project, defining the degree and properties of technical, marketing, environmental aspect of project, identifying the cost and time required for carrying out feasibility study, as well as cost and time required for implementation of project after finishing the feasibility study, determining the resources (human resources, materials and equipments) needed for conducting feasibility study, and preparing a report that includes recommendation for next study phases (to proceed or to terminate).

2.6.2.3 Full Feasibility Study (Phase 3)

Feasibility study is usually conducted after completion of prefeasibility study, where after collecting all detailed information of project (Hyari, K. and Kandil, A., 2009). There are many aims of feasibility study (Mackenzie, W. and Cusworth, N., 2007). The aims of feasibility study include illustrating the variability of project in terms of technical and economical, proposing one project which is most profitable, preparing the structure of project and identifying the scope, cost, time, and quality of recommended project, indicating the complete project scope in order to make sure the effective and efficient use of project resource (human resources, materials and equipments), developing the risk profiles which include list of uncertainties and risk mitigation plan due to reduce risk probabilities occurring during implementation of project, developing the project management plan, accelerating the acquirement of enough project cost to deliver the project on time, and preparing a report that includes recommendation for following project works (to proceed or to terminate).

2.6.3 Failure to Undertake Feasibility Study that is fit for Purpose

In addition, another common abuse of feasibility studies is arising from failure to undertake feasibility study that is fit for purpose (Mackenzie, W. and Cusworth, N., 2007). In other words, it means that the project team unable to carry out the feasibility studies that are in line with the purpose of conducting feasibility studies. With unclear purpose, the project team may lose direction during the process of carrying out the feasibility studies. This will cause to fail to achieve targeted project goals and outcome.

2.6.3.1 Misunderstanding of Objective of Feasibility Study

Developers and project team misunderstand the objective of feasibility study will cause the abuse of feasibility study (Mackenzie, W. and Cusworth, N., 2007). There are many objectives of carrying out feasibility study. Burtonshaw-Gunn (2009) stated that feasibility studies should include various aspects of a project investment, which comprise of technical, economic, trade and financial feasibility. Feasibility studies assist project owners to make wise investment decisions. Moreover, feasibility studies ensure that the chosen project will have a financial return to the organization.

Before carrying out feasibility study, the developers should conduct discussion for gaining information about clients' and other stakeholders' requirements (Shobhit Gupta, 2012). This can be done by having meeting among project team and project stakeholders (Chartered Institute of Building, 2010). In addition, developers should also conduct market analysis for increasing understanding of project team towards market demand of construction project (Novak, 1996).

2.6.3.2 Failure to Achieve Minimum Standard of Feasibility Study

There are several minimum standards of feasibility study, which include content, quality, deliverables, policy, and independent reviews (Mackenzie, W. and Cusworth, N., 2007). The feasibility study which fails to achieve minimum study standard will leads to poor results produced. Hence, the feasibility study in construction industry should fulfill at least of the following standards. The following are the details for each minimum standard of feasibility study.

a) Content

The feasibility study should consist of six components, which are technical, economical or financial, legal, market study, operational and scheduling (Abou-Zeid et al., 2007; Hyari, K. and Kandil, A., 2009; Katimuneetorn, 2008). According to Mackenzie, W. and Cusworth, N. (2007), the project team fails to include all components of feasibility study throughout the feasibility study process, it will increase the probability of overlooking the key issues at the beginning of feasibility study phase or forgetting the key issues at the later phase of feasibility study.

b) Quality

According to Mackenzie, W. and Cusworth, N. (2007), the quality of feasibility study depends on the efforts taken by team members for each study phase (scoping study, prefeasibility study, and feasibility study). The project team members should put equal effort on each phase of feasibility study where each study phase is equally important.

c) Deliverables

The key deliverable of feasibility study is work plan for future project work (Mackenzie, W. and Cusworth, N., 2007). The project team should compile all of analyzed results into a report in which this report can be referred by the project clients (Chartered Institute of Building, 2010). Other than that, this report should be updated by project team members from time to time throughout the feasibility study process.

d) Policy

The developers should include some relevant policies for enhancing the value creation by feasibility study and also reducing the probability of risk occurring (Mackenzie, W. and Cusworth, N., 2007). The policy mandates the application of minimum standard throughout the feasibility study phase. So, the policy should include the reason for explaining the failure of achieving minimum standard of feasibility study.

e) Independent Reviews

Independent reviews are formed when all the works of feasibility study are completed and during preparing the final draft of study report (Mackenzie, W. and Cusworth, N., 2007). Independent reviews are often given by peers of developers, so it is called independent peer reviews. Independent peer reviews are defined as obvious opinions on the feasibility study in line with standard achieved in which these opinions are provided by person who has same level of qualifications with developers. In addition, the independent peer reviews are provided by the professional team which does not has influence on the project outcome (McCarthy, 2013).

2.6.3.3 Inaccurately Measure the Potential of Project

At the first phase of feasibility study (scoping study), the project team members have to evaluate the potential of several new projects (Mackenzie, W. and Cusworth, N., 2007). Abuses of feasibility study will occur due to poor knowledge of project team members in assessing the potential of new project (Abou-Zeid et al., 2007). There are several methods for measuring the viability of project, which include Net Present Value (NPV), Payback Period, Internal Rate of Return (IRR), and benefit-cost analysis (Hyari, K.

and Kandil, A., 2009). Inaccurately in assessing the potential of project will largely affect the reliability of the results of feasibility study which will be used by the developers, project owners and customers. Hence, the project team should recruit professional persons in evaluating the viability of the construction projects.

2.6.3.4 Negligence in Identifying the Features of Project

During the prefeasibility study phase (second phase of feasibility study), the project team members are required to identify the characteristics of the project (Mackenzie, W. and Cusworth, N., 2007). One of the reasons of the feasibility study will fail to be undertaken that are in line with its purpose is that the carelessness of project team members in determining the features of the construction project. There are many sources contribute to this mistake, which include laziness of project team members, lack of experience, lack of attention and inspection from top management (Thomson, 1998). Mistake made in the process of determining the features of the project will cause the results of feasibility study become not accurate and comprehensive.

2.7 CAUSES OF ABUSES OF FEASIBILITY STUDY

Causes of abuses of feasibility study can be categorized into four groups, which include planning and estimation factor, project external issues, personnel factor, and developer attitude.

2.7.1 Planning and Estimation Factors

Project information that are required for planning and estimation include project resources, market demand, cash flow, time estimate, cost and revenue estimate, and land information.

2.7.1.1 Poor Skills of Making Assumption of Resources

Feasibility studies will be abused because of the team members are lacking of the skills in making assumption of resources (Thuy, L. M., 2011; Cushman et al., 2001). Incorrect assumption of resources will cause the results and analyses obtained become inaccurate. Other than that, incorrect assumption can have a large impact on investment decision (*Rieley, 2012)*. In order to prevent this happened, there must have professional person with wide variety of knowledge and skills associated with the construction industry.

2.7.1.2 Lack of Information of Market Demand

Besides that, Thuy, L. M. (2011) states that lack of information of the market demand will cause the feasibility studies being abused. Feasibility studies will only be successful with clear and right information of the market demand. If the developers understand the market demand, then the developers can make right decision of project investment with the analyzed results of feasibility studies (Novak, 1996). A construction project will gain better financial return in the future once they produce the results that fulfill the requirements and needs of the clients (Lin et al., 2007). Developers need to carry out market analysis to investigate the demand of the market. At first, a firm is better to understand the customers' needs, and then just produce the results, products or services that

the customers' desire; compared to after producing the results, products, or services and then just search for the market. This is much waste time, money and resources. In order to avoid this issue occurred; the developers have to take effort to carry out careful investigation on current market situation with the help of professionals (Novak, 1996).

2.7.1.3 Poor Cost and Revenue Estimate

Moreover, Thuy, L. M. (2011) claims that poor estimation of project cost can also cause abuses of feasibility study. Sometimes, analysts who perform feasibility studies will assume the project costs that are not match to the actual costs. According to Flyvbjerg et al. (2002), the probability of having the error of underestimating cost is much higher than that of the error of overestimating cost. If the organization discovers that the planned costs are much differing from the actual costs after the decision had been made and project is started to work on, the organization is either decide to terminate the project or to add more budget for the project. This mistake will cause an organization to face the problem of profit loss, and may lead to conflict among project stakeholders due to profit sharing (Moura, H. and Teixeira, J. C., 2010). There are some steps to prevent this mistake occurred. One of the strategies is that the project team can refer to the previous successful project. With the references to previous successful project, the project team can estimate the planned costs in more accurate way. Furthermore, the developers can collect information form the project contractors. The project contractors are more familiar with the cost of human resources and project materials needed since they have handled so many construction projects for a long period.

2.7.1.4 Poor Time Estimate

Other than that, poor time estimate will contribute to the abuses of feasibility studies (Thuy, L. M., 2011). Project time schedule is one of the triple constraints that often faced by many construction projects (PMBOK Guide 4th edition, 2008). Project time schedule planning has to consider the task dependency. The tasks on the critical path of the project need to be completed on time; otherwise, it will cause the whole project delays (PMBOK Guide 4th edition, 2008). If the project delays, the project may require more resources which include capital, people and material, hence, will require more project cost to cover this additional resources (Kasimu, 2012). The project team can get the advice or opinion from the project experts and contractors in order to reduce the probability of wrong estimation of project time schedule.

2.7.1.5 Poor Forecasting of Cash Flow

Thuy, L. M. (2011) declares that poor forecasting of cash flow is also one of the causes of abuses of feasibility studies. A construction project involves a large amount of investment cost. So, money is an important asset for a construction project (Park et al., 2005). Forecasting project cash flow is one of the important elements in feasibility studies. Park et al. (2005) claimed that there are many uncertainties that affect forecasting of cash flow, which include time delay, cost overrun, cost variation, and earned value of plan and actual. Therefore, the project team needs to pay attention to these uncertainties.

In general, the cash flow of the construction projects consists of cash out which includes bid costs, preconstruction costs (design, transportation, and engineering), construction materials, machinery and equipments, payments of subcontractors, labor and overhead; and cash in which include billings, claims and change orders (Park et al., 2005).

There are some factors contribute to the poor forecasting of cash flow. Flyvbjerg (2002) states that insufficient of data, immature techniques, lack of well-experienced forecasters are classified as some reasons of forecasting error.

According to Park et al. (2005), many construction projects faced the problems of negative cash flow until the end of receiving final payment or during the time of payments or deposits received before the projects started. Hence, the feasibility studies need to have accurate forecasting of cash flow to avoid the construction projects lost profits.

2.7.1.6 Lack of Land Information

Furthermore, lack of land information is also considered as one of the causes of abuses of feasibility studies (Thuy, L. M., 2011). Land information includes the property right on the land which is the site location for the construction project. According to Respicio, A. and Burstein, F. (2012), there is a risk of failure of construction project with the possible covering of property rights on the land. Hence, the project team needs to search and check carefully to avoid any legal cases brought to the organization.

Besides that, it is also essential to investigate the land properties before starting the construction projects. The main purpose of site investigation is to ensure that the chosen site is free of any structural weakness such as the soil properties (Littlejohn, 2005). If project team does not clear with the land properties before the beginning of the construction process, the project team may need to suffer from capital loss. This is because after starting to carry out the project, the project team just discovers that particular site is not suit with the project objective and properties, the project may need to be terminated and may be sued by the clients.

2.7.2 Project External Issues

Project external issues include sustainability issues, legal issues, and concern of community stakeholders. These issues will be discussed in more detailed form in next section.

2.7.2.1 Lack of Sustainability Concern

Sustainable construction consists of three main components which are social, environmental, and economic (Shelbourn et al., 2006). According to Opoku and Fortune (2011), sustainable construction is typically emphasizes on three purposes which include reducing environmental impact of constructed building, ensuring safety and comfort of the consumers, and promote its economic viability. Figure 2.2 shows the concept of sustainable construction and its related issues.

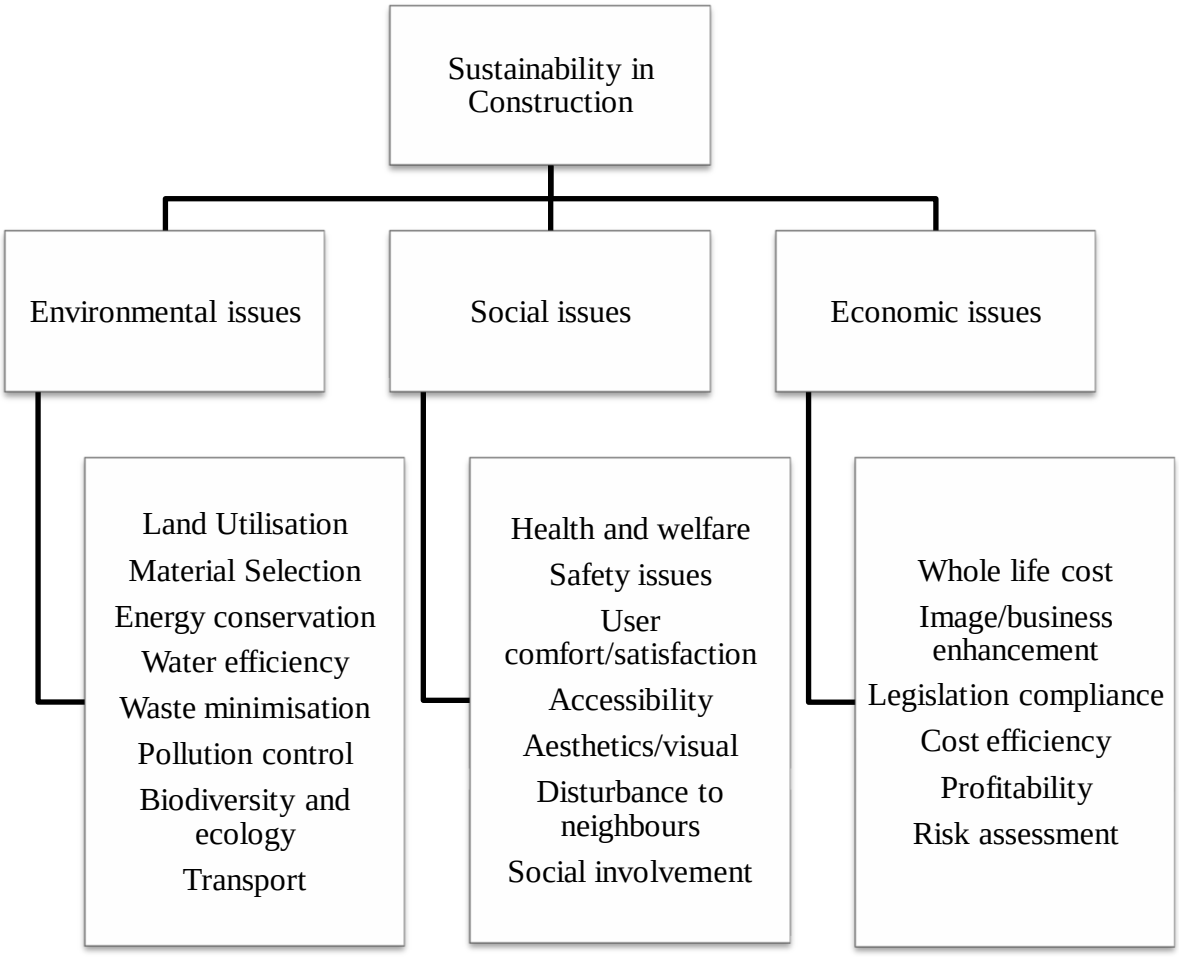

Figure 2.2: Concept and issues of sustainability construction

Source: Zainul Abidin. 2005. Using Value Management to Improve the Consideration of Sustainability within Construction.

In fact, there is less number of developers who are aware of the issues of sustainability in construction projects although green buildings development is greatly

encouraged by government (Zainul Abidin, 2010). Therefore, the feasibility studies for the construction projects often face with the problem of lacking of sustainability concern.

Construction is one of the major contributors to the environmental pollution, hence, the project team; especially project manager should have adequate level of environmental concern and awareness (Irizarry et al., 2012). To be environmental friendly, the project team needs to check and examine the activities of the construction project as well as the area associated with the construction activities (Samari et al., 2013). Besides that, the project team needs to ensure that the construction project meet the government environmental rules and regulations; since government plays the main roles in improving the level of green building development in Malaysia (Samari et al., 2013).

2.7.2.2 Lack of Concern for Legal Issues

Legal aspect is one of the elements that need to be included in the feasibility studies (Abou-Zeid et al., 2007; Katimuneetorn, 2008). In other words, for any feasibility study which lack of legal aspects, such as building law, land law, safety law, and environmental law, the results of the feasibility study can be said as invalid. Hence, the project team needs to concern about the legislative rules and regulations that are set by government (Loosemore, 2003). For example, before carrying out construction project in a particular site, the project team needs to obtain land permit from local authority (Sufian and Rahman, 2008). In addition, according to Victorian Municipal Building Surveyors Group (2005), there is building law that requires all construction works need to have building permit in order to ensure that all construction works are carried out under the rules and regulations. These laws are mainly to secure the safety and health of the clients. Thus, the project team has to carry out careful evaluation on whether the project is complying with the governmental law or not.

2.7.2.3 Lack of Concern for Community Stakeholders

Mackenzie, W. and Cusworth, N. (2007) assert that one of the causes of abuses of feasibility studies is that failure to involve all stakeholders. Project stakeholders have large authority in the construction project. Olander and Landin (2005) assert that the negative attitude of the stakeholders towards the construction projects can have a large impact on the development of the project. They have the power and can influence the decision made in the progress of the construction projects.

Community stakeholders are one of main group of stakeholders in the construction projects (Flint, 2013). Community stakeholders include environmentalists, neighborhoods, non-governmental groups (NGOs), community development group, special interest group and others (Dinsmore and Cabanis-Brewin, 2006). Conflict with the community stakeholders will occur if their needs are not considered in the project decision, in turn, will bring negative effects to the project due to loss of community stakeholders' support (Olander, 2003). So, it is important to consider the needs and preferences of community stakeholders. The community stakeholders are more emphasizing on the aspects of environmental, social, political, economic, health and safety (Dinsmore and Cabanis-Brewin, 2006). According to Flint (2013), the project team needs to have civic engagement, which is the involvement of all affected person in the process of decision making and gaining their support and cooperation for maintaining good relationship with the community stakeholders.

2.7.3 Personnel Factors

Personnel problems in project team can also contribute to abuses of feasibility study, which include lack of communication within the team as well as with the clients, lack of adequate team members to carry out feasibility study, and lack of cooperation from top management, such as lack of firm decision deadlines.

2.7.3.1 Lack of Communication

Inappropriate or ineffective communication of findings also one of the common causes of abuses of feasibility studies (Cushman et al., 2001). There is a need to have a regular meeting among the project team members as well as with the clients (Chartered Institute of Building, 2010). In the meeting, the project team can report about the progress of the construction project, so that all team members understand about the project progress. At the same time, the customers can provide their opinions about their needs and desires on the construction project during the meeting with the clients. According to Kamara et al. (2002), client requirements needs to be addressed because it is the main nature of the project and have to be cooperated with the construction professionals. Hence, two-way communications are vital for the success of a feasibility study.

2.7.3.2 Lack of Adequate Team Member to Carry Out Feasibility Study

There is a need to have adequate number of team member to carry out feasibility study. Lack of adequate of team member to carry out feasibility study will result in delay in completing of feasibility study (Fugar and Agyakwah-Baah, 2010). In addition, it also contributes to poor quality in analysis of feasibility study results (Halligan et al., 1994).

This is because the project team members will simply conduct feasibility study without pay too much attention and passion toward the works. Sometimes, due to lack of time, they may forget some important components that have to be included in the feasibility study. Thus, this will contribute to low quality results, and in turn will cause wrong investment decision made by clients.

2.7.3.3 Lack of Cooperation from Top Management: Lack of Firm Decision Deadlines

Cushman et al. (2001) assert that feasibility studies will be abused because of lack of firm decision deadlines. For the construction projects, there is a human error that causes the project delay, which is called as students' syndrome (Chawan et al., 2012). Students' syndrome is characterized by the common human behavior with the favoring of starting work late. In other words, this human behavior is called as last minute working. This syndrome is often occurring during the implementation of feasibility study, in which the firm usually does not set deadline for the conduction of feasibility studies in an earlier stage.

According PMBOK Guide (2008), project has a definite beginning and end. Hence, every activity of the construction project should have an expected completion time (Hendrickson and Au, 1998). In order words, there is a need to have a deadline for a firm in deciding to carry out which project with the reference to the results of feasibility studies. If a firm has given a due date for conducting the feasibility studies, project team members will not spend too much time on unnecessary works. With a definite deadline, project team members will carry out their roles in the feasibility studies in a more efficient and effective ways. So, this will not delay the timing of the organization in making their decisions.

2.7.4 Developers' Attitude towards Preparation of Feasibility Study

Developer attitude is also one of the causes of abuses of feasibility study. Example of developer attitude includes they are not really care about the feasibility study. Some of developers will quickly carrying out feasibility study with the reason of lack of time to carry out feasibility study. Besides that, there are some other developers' attitudes contribute to abuses of feasibility study, which include failure to progress through the study phases, failure to integrate study discipline, failure to plan for next study phases, failure to recycle study phase, and failure to fix study scope (Mackenzie, W. and Cusworth, N., 2007).

2.7.4.1 Lack of Time to Carry Out Feasibility Study

Some owners of the projects will not spend too much time in carrying out feasibility studies due to save their time (Hendrickson and Au, 1998). This will result in conducting the project with indefinite project scope. As we know, changes in project scope during the progress of the project will increase the construction costs. This will consequently reduce the benefits earned from the projects. Thus, the project management team should consider it carefully and make wise decision that feasibility studies should be carried out.

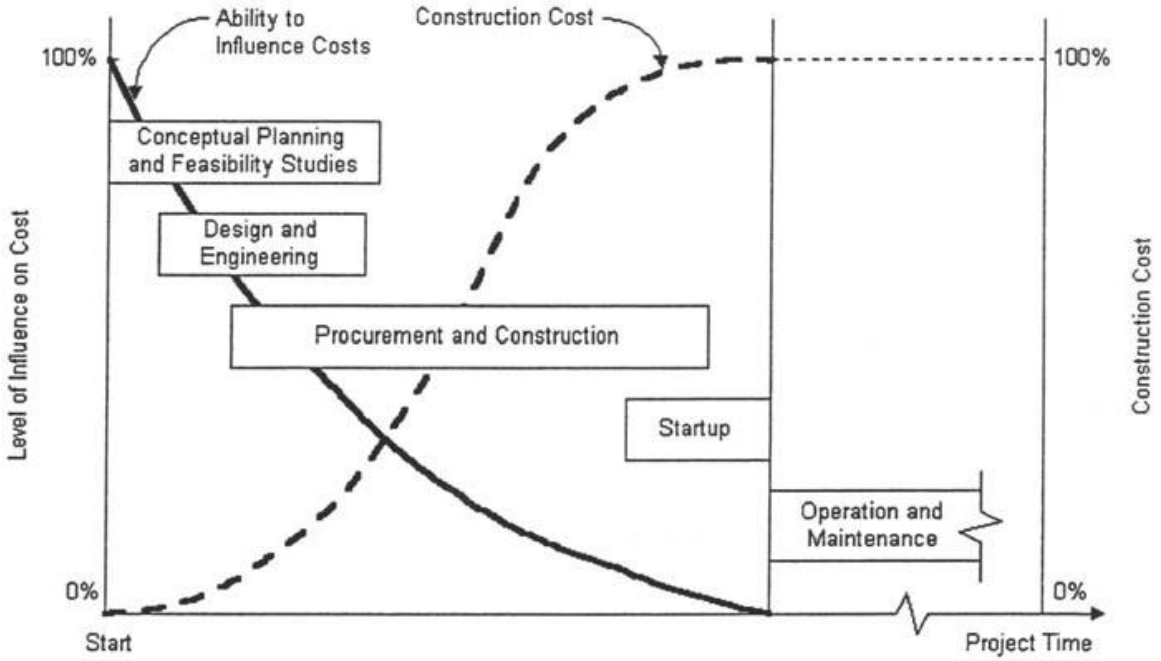

Figure 2.3: Ability to influence construction cost over time

Source: Hendrickson, C. and Au, T. 1998. Project Management for Construction: Fundamental Concepts for Owners, Engineers, Architects, and Builders.

2.7.4.2 Failure to Progress through the Study Phases

Saad (2011) states that the all phases in the project's life cycle are inter-related, in which feasibility studies is at the conceptual planning phase. Hence, if the feasibility study stops during the middle of conceptual planning phase, this can affect the development of the project. If the feasibility studies do not completed as promised before, the project will be started late and the clients will complain and not satisfy with the project works.

Besides that, the termination of feasibility studies during the middle of the process will also lead to wasted project cost. This is due to feasibility studies also require some budget to conduct, if suddenly stop carrying out the feasibility studies, the budget used before cannot be claimed from any stakeholders and the organizations need to cover those lost by their own.

2.7.4.3 Failure to Plan for the Next Study Phase

According to Hendrickson and Au (1998), construction planning is an essential process and often challenging project team during the managing the construction projects. Sometimes, the project team may face the problem of planning during the progress of feasibility studies. If the project team cannot carries out a correct and valid planning whether in terms of schedule or cost, the feasibility studies will be brought into a confused situation. The largest consequences are that the construction projects will face many problems, such as cost overruns, project delay, unsatisfied quality, and scope changes (Abbas and Suhad, 2012). It subsequently will lead to the company have to spend more money to overcome all of these problems.

2.7.4.4 Failure to Recycle through Study Phases

Feasibility study is a recycle process. It is not a one-time process. The phases of feasibility studies are repeated throughout the planning phase of the project. There are always uncertainties exist in the construction projects. According to Migilinskas, D. and Ustinovicius, L. (2008), uncertainties are categorized as threats which are related to indefinite source and impact during the development of construction projects. Uncertainties in construction projects bring a lot of negative effects to project stakeholders. Zayed et al.

(2008) state that uncertainties which include political, economic, cultural, market, and technical risks, that will cut down the profit earned by contractors and subcontractors.

For every uncertainty in the construction project, the project team needs to investigate and evaluate carefully during the process of conducting feasibility studies. Examples of uncertainties that will be occurred in the construction project include change of client requirements, change of economic situation, and limited resources. Hence, every time of uncertainties exist, the project team needs to do a reassessment for the purpose of future advantage.

2.7.4.5 Failure to Fix Study Scope

It is essential to determine the scope of the feasibility study at the beginning of the planning feasibility study. If the project team fails to identify and confirm the study scope before the feasibility study begins, the feasibility study cannot be carried out in line with the study objective. According to Cho and Gibson (2001), construction experts claimed that poor scope definition is one of the major factors of feasibility study failure which will subsequently cause the bad consequences towards the project cost, schedule and operation. However, there are many project owner and construction companies still not spend adequate cost and time to identify the study scope in the early stage of the implementation of construction projects (Dumont et al., 1997).

The project team needs to carry out continuously analysis of the study scope until a defined and definite study scope is determined. This action will spend a lot of time, cost, and human resources. This can be said as wasting. For solving this problem, the project team can get some advises from the expert or professional person in the construction industry. Moreover, the project team can ask and gain confirmation with the client about

the study scope which is associated with their desires. This can be done by having more meeting with the project stakeholders which include clients.

2.8 EFFECTS OF ABUSES OF FEASIBILITY STUDY

Effects of abuses of feasibility study can be categorized into cost-related effect, time-related effect, disputes, client-related effect, quality-related effect, and performance-related effect.

2.8.1 Cost-related Effects

Abuses of feasibility study will cause project cost overrun, or in other words, project cost will be increased. Project costs include labor cost, materials and equipments cost, and some indirect costs. Besides that, the project that does not aligned with legislative rules and regulation will also be penalized in monetary terms. This is turn will cause the project team to pay more money.

2.8.1.1 Increased in Labor Cost

Abuses of feasibility study in construction industry can cause increasing in project cost. Personnel salary is categorized as direct cost of construction project (Blattner, 2008). Errors in planning and estimation of project details can significantly increase personnel salary (Kasimu, 2012). Underestimate project resource, cost and time typically can lead the project owner to suffer from profit loss. For underestimating of project time, the project will delay in completion time; hence, the project team has to recruit more workers in order

to complete the project on time (Guldemond et al., 2008). Recruiting more people for working on construction project will increase personnel expenses, which will increase the overall project cost.

Moreover, underestimating amount of human resources will also require the workers to work overtime. The problem of lacking of resources can be solved by extending the project time (Gido and Clements, 2012). Therefore, the workers have to extend their working time due to difficulty of finding manpower. In order to reward workers for their hard work, they will be given additional overtime salary and bonus (Moura, H. and Teixeira, J. C., 2010).

2.8.1.2 Increased in Material and Equipment Cost

Besides increased personnel salary, the cost of materials and equipments used in project will also be increased due to abuses of feasibility study (Le-Hoai et al., 2008). There is trade off between project cost and project time. The errors made in estimating of quantity of construction materials and equipments at feasibility study phase will cause the project team has to procure more construction materials and equipments, which will cause increasing in material and equipment cost (Guldemond et al., 2008).

2.8.1.3 Increased in Indirect Cost

According to Blattner (2008), indirect costs are costs that are associated with the overhead expenses of construction projects, such as rental cost for construction equipment, workers insurance, legal fees, telephone fees and other costs. Mistakes made in estimating project duration, resources and budget will lead to increasing in indirect costs. The

architects or engineers are responsible for making a draft of the indirect cost of construction projects which are needed to be stated in the contract (Holland and Jr, 1999). Increased in indirect cost will minimize the profit that can be earned by the company (Blattner, 2008). Hence, indirect cost should also be emphasized in cost estimation.

2.8.1.4 Monetary Penalties

During conducting feasibility study, lack of concern for legal issues will lead the project team to be penalized by legal action (Loosemore, 2003). There are some legal issues that must to be included, which are land law, building law, safety law and environmental law (Abou-Zeid et al., 2007; Katimuneetorn, 2008). Some developers will ignore one of these few laws, and thus, will be taken legal action such as penalization in terms of monetary payment (Victorian Municipal Building Surveyors Group, 2005). This will in turn cause the project team suffer from money loss and also will cause the dissatisfaction from project stakeholders.

2.8.2 Time-related Effects

Abuses of feasibility study in construction industry bring a lot of time-related effects, which include project delay, delay in feasibility study, procurement delay, and delay in payment to workers and contractors.

2.8.2.1 Project Delay

One of the effects of abuses of feasibility study is project delay (Matali, 2011). Project delay will occur due to the error in planning and estimation factor. Poor time estimate is the main contributor to the project delay (Le-Hoai et al., 2008). It can cause large deviation from the expected project completion date if the project team underestimates project critical activities (PMBOK Guide 4th edition, 2008). Hence, the project has to add more resources which will automatically increase project cost (Kasimu, 2012).

Moreover, underestimating project resources will also contribute to project delay (Le-Hoai et al., 2008). Because of lack of human resources to carry out project work, then the project activities will not to be completed on time. In addition, lack of firm decision deadlines will also cause project delay. The project team members are not motivated to do the work in which they think that they still have long time for carrying out the work (Chawan et al., 2012). Hence, the cooperation from top level management is essential for the success of project.

2.8.2.2 Delay in Feasibility Study

Personnel problems in company that performing feasibility study will cause time overrun in conducting feasibility study. Lack of expertise and team members for carrying out feasibility study will also cause feasibility study to be delayed (Fugar and Agyakwah-Baah, 2010). Because of lack of skills in planning and estimating project time, cost and resources, the project team members have to spend more times in doing these works in order to produce acceptable results. Besides that, lack of firm decision deadline will also cause the team members lazy to complete the feasibility study within the most

likely time (Chawan et al., 2012). Furthermore, lack of communication among project team members and stakeholders will also cause disputes occurring in project team, in which this will affect the progress of conducting feasibility study (Moura, H. and Teixeira, J. C., 2010).

2.8.2.3 Procurement Delay

According to Brown (2002), there are many reasons of procurement delays, which include inability of developer's project team to forecast the availability of resources, requirements of import of procured materials, and delivery to site. In other words, poor skills of making assumption of resources which resulted from poor quality of information provided by contractors will cause procurement delay (Brown, 2002). Poor skills of estimating resources availability will cause the procurement team unable to negotiate and sign contract with the suppliers of construction materials before the starting of construction process, since most of the construction projects are using firm fixed price contract (Hughes, 2012). Firm fixed price contract requires the buyer organization to clearly specify the requirement of products or services before signing contract, and buyers have to pay for any changes in procurement requirements (PMBOK Guide 4th Edition, 2008).

2.8.2.4 Delay in Payment to Contractor and Workers

Abuses of feasibility study will cause late payment to contractor and workers. Before the contractor and workers start working on construction project, they had signed contract with the developer company in which the contract had enacted particular amount of payment for them (Hendrickson and Au, 1998). Underestimating project duration will cause project delay which has violated the contract requirement that had set and agreed before. These will indirectly causing late payment to contractor and workers. Late payment to contractor and workers will lead to conflict occurring (Zakaria et al., 2012).

2.8.3 Disputes

Abuses of feasibility study will cause disputes. There are many types of disputes that will occur, which include conflict with project clients, conflict with community stakeholders, conflict with contractors and subcontractors, conflict with construction workers, and conflict with local and national authorities.

2.8.3.1 Conflict with Project Clients

Abuses of feasibility study will cause conflict with project clients. Increasing in project cost will lead to conflict with project customers (Moura, H. and Teixeira, J. C., 2010). This is because customers desire for more profits for their own benefits. The construction projects can be divided into two types, which are public investment and private investment (Abou-Zeid et al., 2007). Examples of private investment include offices, houses. The customers are the end-users of the constructed building who are going to purchase it (Moura, H. and Teixeira, J. C., 2010). They aim to earn profits through investment in private projects. On the other hands, example of public project includes highway. For public project, the customers are indirectly involved in the public project through paying government taxes (Moura, H. and Teixeira, J. C., 2010).

Moreover, abuses of feasibility study resulted from poor estimation and planning will cause additional cost which will reduce the profit that can be earned by project clients. Besides that, lack of communication with clients will also cause conflict to be happened (Kamara et al., 2002). The project team has to take attention to the needs and preferences of clients since clients have large influence in the project (Olander and Landin, 2005).

2.8.3.2 Conflict with Community Stakeholder

Dissatisfaction of community stakeholders is mainly due to feasibility study lack of concern for the community stakeholders. There are some construction projects which ignore the community interest and needs (Moura, H. and Teixeira, J. C., 2010). This will affect the sales and profitability of the project (Olander, 2003). One of the examples is that the community stakeholders have the right to acquire the constructed building such as residential house (Badiru and Osisanya, 2013). For commercial building such as shopping mall (Bennett, 2012), if the shopping mall is not designed according to the preferences of community stakeholders, then the sales of that shopping mall may not be as good as expected. On the other hands, examples of community stakeholders include environmentalists, who can affect project decision. They have the power to appeal society members to carry out some actions such as strikes and boycotts if that particular construction projects have negative impacts on the environment (Moura, H. and Teixeira, J. C., 2010). So, it is important to consider the desire and requirements of community stakeholders (Flint, 2013).

2.8.3.3 Conflict with Contractors and Subcontractors

Abuses of feasibility study can cause conflict with contractors. Conflict with contractors can occur due to different site conditions, change orders, delays, additional works, and change of requirement in contract document (Moura, H. and Teixeira, J. C., 2010). At the stage of feasibility study of construction, poor estimation and planning skills of project team will lead to some changes to occur at implementation stage of construction project (Keane et al., 2010). Project changes can cause additional project cost, project delay, change in project scope (Hwang and Low, 2012), in which these changes contribute to the conflict with contractors.

Other than that, unclear construction plan can in turn cause conflict with subcontractors (Shapiro, 2005). Because of rework, contractors will ask subcontractors to do more works which increase the workload of subcontractors, in which some of contractors' tasks overlap with subcontractors' tasks (Keane et al., 2010). This brings disadvantages to subcontractors which will lead to dissatisfaction.

2.8.3.4 Conflict with Construction Workers

Abuses of feasibility study can cause conflict with construction workers. Changes in construction plan such as changes in project scope can cause additional work to construction workers (Hwang and Low, 2012). This will cause dissatisfaction of construction workers. Construction workers will express their dissatisfaction by having strikes (Applebaum, 1999). If workers strike occurs, it will affect the project completion time. In addition, the project team will also will suffer from money loss due to strike. This is because project team has to find ways to console the construction workers who are dissatisfied, such as motivate them by giving overtime payment (Moura, H. and Teixeira, J. C., 2010).

2.8.3.5 Conflict with Local and National Authorities

Abuses of feasibility study can cause conflict with local and national authorities. Local and national authorities have power to influence project decision, since they have authority in issuing final approvals on the projects (Loosemore, 2003). Construction project that does not conformance with legislative rules and regulation will affect the project starting time, since project that does not aligned with governmental rules and regulation will not be approved by local and national authorities (Sufian and Rahman, 2008). Conflict with local and national authorities can be solved by having informal contracts with them

throughout the progress of construction project (Moura, H. and Teixeira, J. C., 2010). By having informal contract with local and national authorities, it can ensure that the project is aligned with governmental laws in all stages of project development.

2.8.4 Client-related Effects

Abuses of feasibility study in construction industry bring a lot of disadvantages to clients, which include making wrong investment decision, suffered from profit loss, have to pay additional cost for changing contract requirement, and delay in decision making.

2.8.4.1 Make Wrong Investment Decision

Abuses of feasibility study will cause the clients make wrong or unwise investment decision (Abou-Zeid et al., 2007). Feasibility study acts as guidelines for clients to choose the project which are profitable (El-Reedy, M. A., 2012). Hence, poor results of feasibility study can lead to customers make wrong investment decision. It is advisable for project team to include all necessary components in feasibility study for careful and detailed evaluation in order to produce accurate results (Hyari, K. and Kandil, A., 2009).

2.8.4.2 Profit Loss

The customers are also suffered from profit loss due to abuses of feasibility study. Abuses of feasibility study produce low quality results, in which underestimating time and cost occurred in most circumstances. Underestimating time, cost and resources are subsequently increasing project cost (Kasimu, 2012), which are opposing the clients'

desires of earning more profits and monetary benefits. Clients have to add more investment cost as a result of project delay. This is due to project delay cause increasing in direct cost and indirect cost (such as labor cost, material and equipment cost) (Matali, 2011). In addition, incorrect financial analysis of feasibility study will make confuse to customers in making investment decision (Abou-Zeid et al., 2007).

2.8.4.3 Pay Additional Cost for Changing Contract Requirement

According to Hughes (2012), firm fixed price contract is the most commonly types of contract used in construction industry. Any changes in the specifications of purchasing of project resources (human resources, materials, equipment, services) that had stated in the firm fixed price contract will cause additional cost payment to the clients (PMBOK Guide 4th Edition, 2008). So that, mistakes made in estimating project resources during feasibility study phase will cause the project team to acquire additional project resources at the later stage of actual construction works. This in turn will cause changes to be made on the requirements of procurement in the contract that had been awarded at the earliest stage of construction project.

2.8.4.4 Delay in Client Decision Making

Furthermore, lack of human resources for conducting feasibility study will also cause time overrun (Fugar and Agyakwah-Baah, 2010). This is because one person has to responsible for managing so many things at the same time. They may not able to handle so many things at the same time. Late in progress of feasibility study will cause delay in analysis of components of feasibility study produced. Clients use results of feasibility study to make their investment decision (El-Reedy, M. A., 2012). Hence, delay of feasibility

study will cause the dissatisfaction of clients and in turn will cause clients late in decision making.

2.8.5 Quality-related Effects

Abuses of feasibility study will cause poor results to be produced, which then will be used as a guideline for clients during investment decision making (El-Reedy, M. A., 2012). Besides producing poor results of feasibility study, improper feasibility study will also lower the quality of project, increase project risk, and affect the reputation of performing organization.

2.8.5.1 Poor Quality of Feasibility Study: Produce Poor Result

Improper feasibility study will produce poor results of feasibility study. Abuses of feasibility study will cause the project stakeholders' expectation become impractical and unattainable (Mackenzie, W. and Cusworth, N., 2007). Particularly, poor estimating of time, resources, and cost of project will produce inaccurate results (Thuy, L. M., 2011). According to Halligan et al. (1994), lack of members in the project team for conducting feasibility study typically contribute to poor quality of results of feasibility study. This is because there is lack of expertise in analyzing the findings of feasibility study. According to Hyari, K. and Kandil, A. (2009), feasibility study is used to evaluate the variability and profitability of project. Hence, poor quality result can make customers confuse in making investment decision.

2.8.5.2 Low Quality of Project

There are many factors affecting the quality of construction project, which include not conformance to specification, lack of competent workers, low quality of construction equipment and materials, and lack of meeting among project team members (Enshassi et al., 2009). Abuses of feasibility study will contribute to low quality of project. This is because improper feasibility study is mainly resulted from poor planning and management in terms of technical, economical and managerial (Alinaitwe, 2008).

Each phase of construction project is equally important to overall project success (PMBOK Guide 4th edition, 2008). There are six phases in project life cycle which include: (1) feasibility phase, (2) project starting, (3) project organizing, definition, and planning, (4) project execution, (5) project close-out, and (6) post-project evaluation (Archibald et al., 2012). In other words, the project team has to pay equal attention and put equal effort in each phase of construction project. Therefore, feasibility study should be conducted carefully before the starting of implementation of construction project in order to achieve high quality project which lead to project success.

2.8.5.3 Increase Project Risk

Abuses of feasibility study are one of the main sources of project risk (Shobhit Gupta, 2012). Improper feasibility study will create many risk factors that cause project failure. Shobhit Gupta (2012) asserts that misunderstanding of project objectives, poor

estimating and planning of resources, manpower, and finance are potential risk factors during the stage of feasibility study.

Other than that, Thuyet et al. (2007) had carried out a study on risk management in oil and gas construction projects in Vietnam, their results shown that improper feasibility study is one of the top ten risk factors. There are many types of risk in construction project, which include financial risk, construction risk, technological risk, political risk, environmental risk, legal risk, communication risk and other risk (Tadayon et al., 2012). Poor feasibility study typically contributes to financial risk, and operation and maintenance risk (Syed Ahmad Bokharey et al., 2010). Hence, the project team should put more attentions on analyzing technical and financial aspects during the process of feasibility study.

2.8.5.4 Affect Reputation of Performing Organization

Abuses of feasibility study will also affect the reputation of the organization that performing the feasibility study. For example, one of the causes of abuses of feasibility study is poor time estimate which will cause project delay, which in turn will damage the image of the company (Afshari et al., 2011). Abuses of feasibility study will bring many disadvantages to clients which will cause the clients lose confidence towards that particular company (McKenna, 2013). Other than that, rumors spread very fast through internet, in which these rumors will damage the reputation of the organization which is performing feasibility study (Hitlin, 2003).

2.8.6 Performance-related Effects

Abuses of feasibility study also bring some performance-related effects, which include poor performance of project, project failure, poor performance of workers, and low sales of constructed buildings. There are many cases of uncompleted buildings all around the world, where uncompleted building is considered as project failure (Otim et al., 2011).

2.8.6.1 Poor Performance of Project

Othman et al. (2005) had carried out a research on analysis of factors that drive brief development in construction. Their findings stated that improper feasibility study has very high influence on the brief development in construction industry. This can be explained in terms of relative importance index (RII) where RII above 0.800 indicates that very high influence. By conducting questionnaire survey followed by structured interview, the results analyzed shown that relative importance index (RII) of improper feasibility study is 0.844. So, it can be said that abuses of feasibility study will contribute to poor performance of project.

Poor performance of project can be resulted from selection of inefficient machineries and equipment, and low productivity of workers (Syed Ahmad Bokharey et al., 2010). Utilization of low quality machines and equipment, and poor workmanship can affect the development of construction project, which will delay the project completion time (Haseeb et al., 2011). Besides that, inefficient construction materials and equipment, and workers absenteeism will cause cost overrun (Memon et al., 2011). Project delay and cost overrun subsequently reduce the probabilities of achieving good performance of project (Leach, 1997).

2.8.6.2 Project Failure: Uncompleted Building

Otim et al. (2011) assert that improper feasibility study is one of top 15 causes of uncompleted buildings. Furthermore, Adenuga (2012) states that improper feasibility study is one of the engineers' contributions to building failures. Lack of technical, economic and managerial information during the stage of feasibility study will affect the clients' performance which will directly influence the development of construction project (Alinaitwe, 2008). There are many impacts of uncompleted building. Uncompleted building leads to property loss, profit loss and market loss for suppliers, quality degradation, and low corporate market value (Otim et al., 2011).

2.8.6.3 Poor Performance of Workers

Underestimating human resources for construction works will cause poor performance of workers. Poor performance of workers is normally resulted from work overload, and poor safety and health condition at construction site. Due to difficult to find more human resources for construction project within short period of time, the project team has to demand construction workers to work overtime (Bohlander and Snell, 2007). Because of work overload, the workers will feel tired and lack of energy for carrying out construction works. In addition, work overload will contribute to workers feel stress, in which this leads to low performance and low productivity of workers (Ibem et al., 2011).

Other than that, poor safety and health condition at construction site will cause the workers feel that their safety will not be secured, which will lead them do not concentrate while working. If the workers are less concentrate on their works, the accident rate will be higher. The poorer the safety and health at construction site, the higher the probability of accident occurring (Carbonari et al., 2010).

2.8.6.4 Low Sales of Constructed Building

Abuses of feasibility study will indirectly affect the sales of constructed building. Nowadays, customers are more influenced by each others' opinions more than the marketing strategy done by the company such as commercial advertisement (through newspaper, magazine, television and radio station) (Parise et al., 2008). In this era of fast growing technology and the people has the right of free giving out opinion nowadays, they are often posting their comments about certain products on internet, such as Facebook, Twitter, and YouTube (**Salvania and Pabico, 2010)**. This news will be spread in very fast way. Hence, if the buildings built and then sold by the construction company are low quality, then the sales of their constructed building will be low. This will subsequently affect the income of the construction company. In addition, higher price of building because of high production cost of construction project will also cause low willingness of purchasing by buyer (Dodds and Monroe, 1985).

2.9 CORRELATION FRAMEWORK

The relationship between causes and effects of abuses of feasibility study in construction industry is shown as in the Figure 2.4.

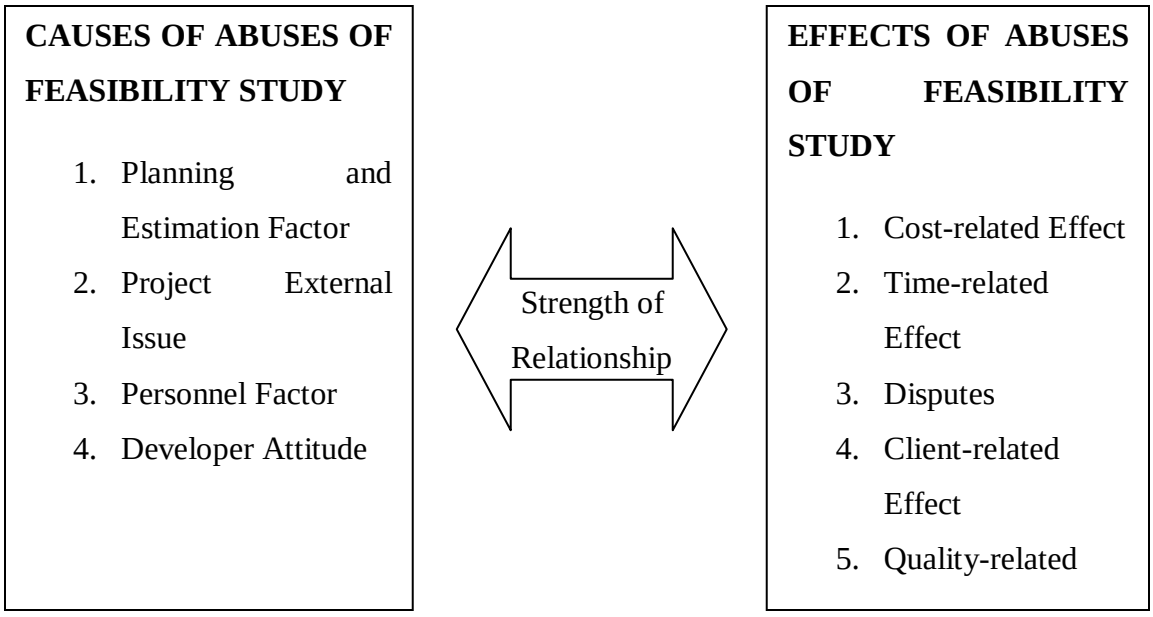

Figure 2.4: Correlation framework of causes and effects of abuses of feasibility study in construction industry

From Figure 2.4, it shows the correlation framework of causes and effects of abuses of feasibility study in construction industry. In this research, it is going to determine what type of relationship between causes of abuses of feasibility study and effects of abuses of feasibility study in construction industry. It is typically to determine whether the relationship between the causes and effects of abuses of feasibility study is positive correlation or negative correlation. Besides that, it also aims to investigate whether the relationship between the causes and effects of abuses of feasibility study is significant or not significant. For example, is there the planning and estimation factor significantly influencing cost-related effects (such as increasing project cost) or just occur by chance or do not have any significant effect. By referring to Figure 2.4, the causes of abuses of feasibility study are categorized into four groups; whereas the effects of abuses of feasibility study are categorized into six groups.

2.10 CONCLUSION

In conclusion, feasibility studies play important roles in construction industry. Feasibility studies help to select the projects which have the higher profitability and financial rate of return. According to PMBOK Guide (2008), a project is unique and different from other project. Every project has different features and characteristics, the developers and project team can carry out feasibility studies to compare the different project with various features and characteristics at the conception or initiation phase of the project's life cycle. Hence, feasibility studies are useful strategy in enhancing the competitive position of the company and also increasing the profit earned from the project conducted.

There are six components that should be included in the feasibility studies for construction project, which includes technical, economic or financial, legal, operational, marketing, and scheduling aspect. With the analysis of these elements, the developers and project team can compare among different project in more detailed form.

In fact, there are abuses of feasibility study in construction industry, in which this issue is rarely investigated by the researchers all around the world. The developers and project team are advised to be more aware of the identified cause and effects of abuses of feasibility study in this research in order to avoid any inaccurate results obtained from the feasibility studies that have been carried out. Last but not least, with the clear guidelines for the preparation of the feasibility study and strong awareness of the causes and effects of abuses of feasibility study, the developers and project team can produce high quality result, which will help clients to get higher profit and monetary return from the construction project that has been chosen to be conducted.

CHAPTER 3

METHODOLOGY

3.1 INTRODUCTION

This chapter is typically discussing about the methodology using in the research. The elements that are discussed in this chapter include research design, research method, the population and sampling in this research, data distribution and collection techniques, development of measure design of question, and statistical analysis. All of these elements tend to describe the processes of conducting this research and measuring the validity and accuracy of the research. Research methodology is an essential element in conducting a research, so, there is a need to determine the most appropriate way to conduct research.

3.2 RESEARCH DESIGN

Research design needs to be identified before starting to do a research. Research design will be act as guidelines in conducting the research in order to make sure the

research is conducted in systematic way. The research design for this research is mainly focused on identifying the causes and effects of abuses of feasibility study in construction industry, as well as the types of abuses occurred in feasibility study in construction industry. Besides that, the research design is also aiming to measure the relationship between the causes and effects of abuses of feasibility study in construction industry. There are five phases determined in the research design, which are identification of the research field, literature review, data collection, data analysis, and preparation of full research report (Figure 3.1).

3.2.1 Identification of the Research Field

Firstly, the research topic and objectives has to be determined and approved by the final year project evaluator. After deciding the topic and objectives of the research, the problem underlying the research has to be written in the form of statement. Strong problem statement will increase the desirability of carrying out the research. Next, the scope of the research has to be identified and justified. The scope of the study is one of the essential elements of the research that needs to be examined carefully. This is because the final results of the study are collected based on the scope of the study.

3.2.2 Literature Review

Literature review is a stage that mainly to find support information for the research. The support information is to strengthen the reliability of the research. Besides that, literature review is also helpful tool in determining the questions that needs to be included in the questionnaires. In addition, literature review stimulates the creative thinking of idea about the research, for examples, by continuously reading journal articles and books, it will lead to critical thinking, in turn, will stimulate the creation of ideas that are not included in

the previous studies. The information for literature review normally can be obtained from journals, books, articles, online sources, and other sources.

3.2.3 Data Collection

The data collection is to collect data of the research in order to investigate whether the objectives of the research have achieved or not. The method for data collection of this research will be postal questionnaires, which will be distributed by posting to each company. This method is time-consuming and incurs lower cost.

3.2.4 Data Analysis

After data collection, the data have to be analyzed. The data needs to be analyzed for its reliability and normality. The collected questionnaires have to be checked for its reliability and normality by conducting pilot test. The questionnaires with high validity mean that the objectives of the research are successfully achieved. Besides that, the data will be analyzed by using SPSS (Statistical Product and Service Solutions), and also Pearson correlation method will be used to evaluate the relationship between the causes and effects of abuses of feasibility study.

3.2.5 Preparation of Full Research Report

Finally, a complete report has to be prepared. All of the research information, literature review and findings need to be included in the final report. After finishes writing the report, a final checking will be carried out to ensure there are no mistakes made and the

results are relevant to the research's objectives. Then, this report has to submit to supervisor, panels and final year project evaluators for the purposes of evaluation and giving marks on the research works.

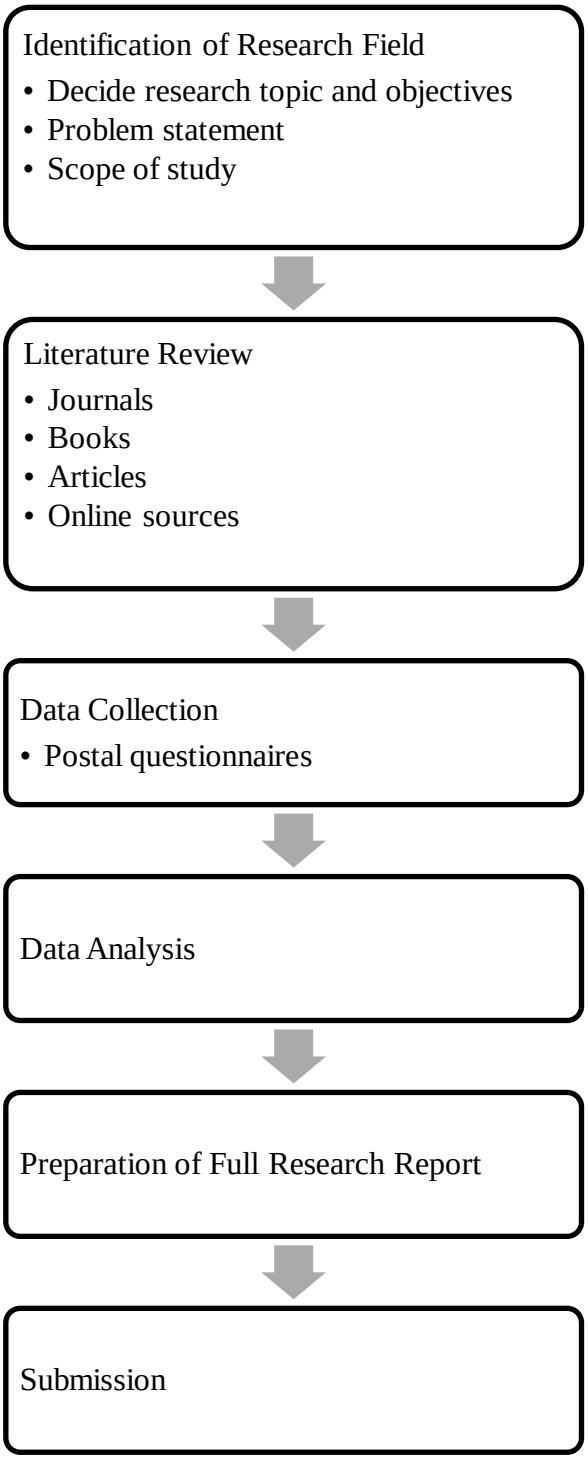

Figure 3.1: Research design

3.3 RESEARCH METHOD

The population of the research respondents is generally derived from the member list of Real Estate and Housing Developers' Association (REHDA). The chosen respondents are developers at Johor, Malaysia. The reason of choosing developers as respondents is due to the feasibility studies are typically carried out by developers at the initiation phase of the construction projects. REHDA Institute is a representative body of developers in Malaysia. Research method used in the research is questionnaires which will be distributed by posting to each company. This method is also called as postal questionnaires. The details will be discussed in the next section.

3.4 POPULATION AND SAMPLING

According to Hanlon and Larget (2011), a population is a complete collection of all individuals or measurements outcomes under study, in which it is impossible to collect all data from all individuals of that population. On the other hands, a sample is a subset of population that containing individuals that are actually observed.

In general, the researchers will collect their data by selecting a small group of respondents that can represent the major characteristics of the population (Bartlett et al., 2001). According to Krejcie and Morgan (1970), the sample size of the research can be determined by using the formula as expressed in Eq. (3.1).

$$s = X^2 NP\,(1-P) \div d^2\,(N-1) + X^2 P\,(1-P) \qquad (3.1)$$

Where s = required sample size

X^2 = the table value of chi-square for 1 degree of freedom at the desired confidence level (3.841)

N = the population size

P = the population proportion (assumed to be 0.50 since this would provide the maximum sample size)

d = the degree of accuracy expressed as a proportion (0.05)

There are several types of sampling method, which includes random sampling, stratified sampling, systematic sampling, cluster sampling, convenience sampling, and snowball sampling (Simon and Goes, 2012). In this research, convenience sampling is used to collect data. Convenience sampling is a method in which sample population is readily available and convenient.

By referring to member list of REHDA, the population for this research is about 109 developer companies. By using the above formula for determining the sample size which is indicated by Krejcie and Morgan (1970), the approximate number of sample size will be calculated as following:

$$s = X^2 NP\,(1-P) \div d^2\,(N-1) + X^2 P\,(1-P)$$

$$s = 3.841(109)(0.50)(1-0.50) \div 0.05^2(109-1) + 3.841(0.50)(1-0.50)$$

$$s = 85.0780 \approx 85 \text{ respondents}$$

3.5 DATA DISTRIBUTION AND COLLECTION TECHNIQUES

The research data will be collected through distributing questionnaires. The method used for distributing questionnaires is by posting to each company or can be called as postal questionnaire. The main reason of choosing postal questionnaire is that this method incurs lower cost (Scheuren, 2004). However, this method is not easy to be carried out.

There are many advantages of postal survey (Scheuren, 2004). Besides cost saving, postal survey is also a convenient method for the researcher to target the specific segments of population in an easier way. In addition, questionnaires distributed by posting to each company also enhance high degree of privacy for the respondents. This in turn will increase the level of honesty, in which the validity of the answer given by the respondents will be higher.

There are some processes for carrying out postal questionnaire. Before sending questionnaires to the developer company, the researcher has to make call to the companies. This is to make confirmation with the companies' address. Besides that, there is also a need to fix a due date for the company to send back the questionnaire for the researcher. After sending questionnaires, the researcher also has to make contact with the companies to ensure the companies have received the questionnaires and also make appreciation to the companies for answering the questionnaires.

3.6 DEVELOPMENT OF MEASURE DESIGN OF QUESTION

For measuring the design of questions, there are two types of measures have to be considered, which include measure of central tendency, and measure of variation or measure of dispersion. Measure of central tendency can be demonstrated by calculating the mean, whereas measure of variation can be demonstrated by calculating the standard

deviation. According to Carey (2000), mean and standard deviation are used to measure the magnitude of differences in preferences among individual. Mean is the sum of the values divided by the total number of values. The formula of mean is as expressed in Eq. (3.2):

$$mean = \frac{1}{n} \sum_{i=0}^{n} a_i \tag{3.2}$$

Standard deviation measures the spread of the data set and the relationship of the mean to the rest of the data. If the data points are closely with the mean, the standard deviation will be small. This indicates that the responses are moderately consistent. In contrast, if the data points are far away from the mean, this indicates there are large differences in the responses, by which the standard deviation will be larger. The formula of standard deviation is as expressed as in Eq. (3.3):

$$standard\ deviation, s = \sqrt{\frac{1}{N-1} \sum_{i=1}^{N} (x_i - \bar{x})^2} \tag{3.3}$$

The questions designed in the questionnaire are closed-ended questions. For closed-ended questions, the respondents have to look at each possible response independent of other choices (Glasow, 2005). The questions are generally designed in terms of ranking. So, Likert Scale is used in designing the survey questions. This method is designed for convenient of respondents. Classification of the Likert Scale ranking is shown below:

1 – Strongly Disagree
2 – Disagree
3 – Neutral
4 – Agree
5 – Strongly Agree

The questionnaire is divided into four sections, which are Section A, Section B, Section C, and Section D. Section A is typically about the personal information of

developers, such as gender, current position in company, working experience, and others. Section B consists of questions associated with the types of abuses occurred in feasibility study in construction industry. On the other hands, Section C is made up of questions which are related to the causes of abuses of feasibility studies in construction industry. And Section D is composed of the questions related to effects of abuses of feasibility studies in construction industry.

There are three main types of measurement scale in this research, which include nominal scale, ordinal scale, and interval scale. Nominal scale classifies data into mutually exclusive (non-overlapping), exhausting categories in which no order or ranking can be imposed on the data. Example of nominal-level data includes gender (male, female). On the other hands, ordinal scale classifies data into categories that can be ranked; however, precise differences between the ranks do not exist. Example of ordinal-level data includes Likert Scale (strongly disagree/disagree/neutral/agree/strongly agree). Last but not least, interval scale ranks data and precise differences between units of measure do exist; however, there is no meaningful zero. Example of interval-level data includes years of experience of the respondents in construction industry.

3.7 STATISTICAL TECHNIQUES

Reliability and validity are measurements of research instrument in which good reliability and validity instrument will produce good results (Burton and Mazerolle, 2011). Validity is the extent to which any measuring instrument measures what it is intended to measure (Carmines, 1979). According to Burton and Mazerolle (2011), there are four types of validity, which include face validity, content validity, criterion validity, and construct validity (as shown in table 3.1). On the other hands, reliability is the extent to which repeating doing measurements in which results will be almost same (Drost, 2011).

For the statistical analysis of the questionnaires, SPSS (Statistical Product and Service Solutions) is used. SPSS is a software package which is commonly used by researchers for statistical analysis of research. SPSS is useful software for analyzing research results in which it offers a rich set of tools for carrying out data management tasks.

In addition, Pearson Correlation Method will be used to measure the relationship between the causes and effects of failure of feasibility study for construction projects. According to Sambasivan and Yau (2007), Pearson correlation analysis is powerful method to study the relationship between variables that have interval data (Likert-scale). Therefore, Pearson correlation analysis was done to study the empirical relationship between the categories of causes and effects. The researcher chooses to use Pearson correlation analysis instead of regression analysis. This is because regression analysis is used to assess the relationship between one dependent variable and several independent variables. Pearson's correlation coefficient (r) is a measure of the strength of the relationship between two variables. It is ranging from -1 to +1 in which -1 indicate negative relationship while +1 indicates positive relationship.

Besides that, normality test is also used in this research to determine whether the sample might have come from a normal population or not. The most reasonable normal distribution is the one whose mean and standard deviation are the same as the sample mean and standard deviation.

Table 3.1: Methods of survey validation

Type	Description	Purpose
Face validity	Evaluation of an instrument's appearance and its relevance by a group of experts and/ or potential participants and is subjective assessment.	Establishing an instrument's ease of use, clarity, and reasonableness of items in relation to the perceived purpose of the instrument.
Content validity	Evaluation of an instrument's representativeness and fairness of the topic to be studied by a group of experts.	Establishing an instrument's trustworthiness, accuracy, relevance, and breadth of knowledge regarding the domain.
Criterion validity	Evaluation of an instrument's correlation with another criterion measure, which is accepted as valid.	Establishing an instrument's selection over another or establishing the predictability of the measure for a future criterion.
Construct validity	Evaluation of an instrument's ability to relate to other variables or whether the operational definition of a variable actually reflects the theoretical meanings of a concept.	Establishing an instrument's ability to evaluate the degree to which the inferences are made that is aligned with its theoretical meanings.

Source: Burton and Mazerolle. 2011. Survey Instrument Validity Part I: Principles of Survey Instrument Development and Validation in Athletic Training Education Research.

3.8 CONCLUSION

In conclusion, a proper research design is critical criteria of a successful research. With the suitable research method, the desirable results just can be obtained. A research is a step-by step process, so the research has to be carried out in sequence. The instrument used in this research is questionnaires which are distributed by posting to each company. Questionnaires through postal method are a cost saving method and enhance high degree of privacy of the respondents. However, this research can only be successful with the cooperation of developer companies which are the samples of the study.

The questionnaire used in this research is composed of closed-ended questions. These closed-ended questions are rated with Likert Scale, which ranking from 1 (Strongly Disagree) to 5 (Strongly Agree). In addition, the questionnaire for this research consists of four sections, which are Section A (personal information of developers), Section B (questions associated with types of abuses occurred in the feasibility studies), Section C (questions associated with the causes of abuses of feasibility studies), and Section D (questions associated with the effects of abuses of feasibility studies). In this research, mean and standard deviation are used as a measure of magnitude of differences in preferences among individual.

Moreover, there are a few statistical techniques used in this research, which include validity and reliability testing. These two testing is typically associated with the measurement of instrument. With the application of these two testing, the instrument used in this research can be proved that it is valid and reliable in order to produce desirable results. Moreover, SPSS software, Pearson correlation method, and normality test are also used in this research for statistical analysis.

CHAPTER 4

RESULTS AND DISCUSSION

4.1 INTRODUCTION

This chapter is mainly about the analysis of the data obtained from collection of questionnaires. The research data are typically analyzed by using the SPSS software. Firstly, the personal information of respondents will be analyzed, which can be known as demographic analysis. The personal information of respondents is mainly analyzed in terms of descriptive frequencies, which are mostly expressed in units of percentage. The second component of this chapter is the interpretation of data of reliability test of questionnaire which are explained in terms of Cronbach's Alpha. The reliability test is mainly to evaluate the reliability of research instrument (questionnaire). Thirdly, the Shapiro-Wilk test is used for the purpose of normality test. Normality test is mainly to determine whether the data are normally distributed or not. Next, the fourth component of this chapter is the mean and ranking of types of abuses of feasibility study, causes and effects of abuses of feasibility study occurred in construction projects. Last but not least, to fulfill the research objective, the Pearson Correlation Coefficient analysis is carried out, which is mainly to examine the

relationship between the causes and effects of abuses of feasibility study in construction industry. The analyzed data are shown in the form of tables and charts for better understanding and attractive presentation.

4.2 RESPONSE RATE

In this research, the respondents are developers who are the REHDA (Real Estate and Housing Developers' Association) members in Johor, Malaysia. There are 109 developers of all kinds of construction projects in Johor, Malaysia. Hence, 109 sets of questionnaire were posted to each developer company in Johor, Malaysia. In fact, 85 sets of questionnaire should be collected back, however, there are only 35 sets of questionnaire were collected back. Therefore, 35 sets of questionnaire were used for the analysis of data. 35 sets of questionnaire can be expressed as 32% response rate. 32% response rate is considered as acceptable response rate for the uses of research data analysis. Chatman (2007) stated that 30% or above response rate is adequate for a research analysis and results are valid. Besides that, Sekaran (2003) claimed that response rate of 30% is the minimum level of response rate and is acceptable for statistical analysis.

4.3 DEMOGRAPHIC ANALYSIS

The demographic analysis of respondents is mainly to identify the descriptive statistics of gender, current position, qualification, and years of experience of respondents in construction. Other than that, the demographic analysis also analyzes the data in terms of descriptive frequencies, which include mean, median, mode, sum, standard deviation and percentage. The results of demographic analysis are presented in pie chart form, in which pie chart is more obvious figure for readers to read.

Table 4.1 and Table 4.2 show the demographic analysis of respondents in terms frequency statistics, which include the gender of the respondents, current position of respondents in the company, qualification of respondents, and years of experience of respondents in construction.

Table 4.1: Demographic analysis of respondents

Variables	**Frequency**	**Percentage (%)**
Gender		
i. Male	26	74.3
ii. Female	9	25.7
Current Position		
i. Project Manager	9	25.7
ii. Civil Engineer	6	17.1
iii. Architect	1	2.9
iv. Quantity Surveyor	3	8.6
v. Director	11	31.4
vi. Others (Assistant Project Manager, Acting General Manager, Head of Department, Design Engineer)	5	14.3
Qualification		
i. Bachelors Degree	28	80.0
ii. Masters Degree	6	17.1
iii. PHD	0	0.0
iv. Others	1	2.9
Years of Experience in Construction (years)		
i. 0-5	2	5.7
ii. 6-10	9	25.7
iii. 11-15	10	28.6
iv. 16 and above	14	40.0

Table 4.2: Respondents' mean value

Statistics

	Gender of respondent	Current position of respondent	Qualification of respondent	Years of experience of respondent
N Valid	35	35	35	35
Missing	0	0	0	0
Mean	1.2571	3.4571	1.2571	3.0286
Median	1.0000	4.0000	1.0000	3.0000
Mode	1.00	5.00	1.00	4.00
Std. Deviation	.44344	1.93030	.61083	.95442
Sum	44.00	121.00	44.00	106.00

4.3.1 Gender of Respondents

Table 4.3: Gender of respondents

Gender of Respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	26	74.3	74.3	74.3
	Female	9	25.7	25.7	100.0
	Total	35	100.0	100.0	

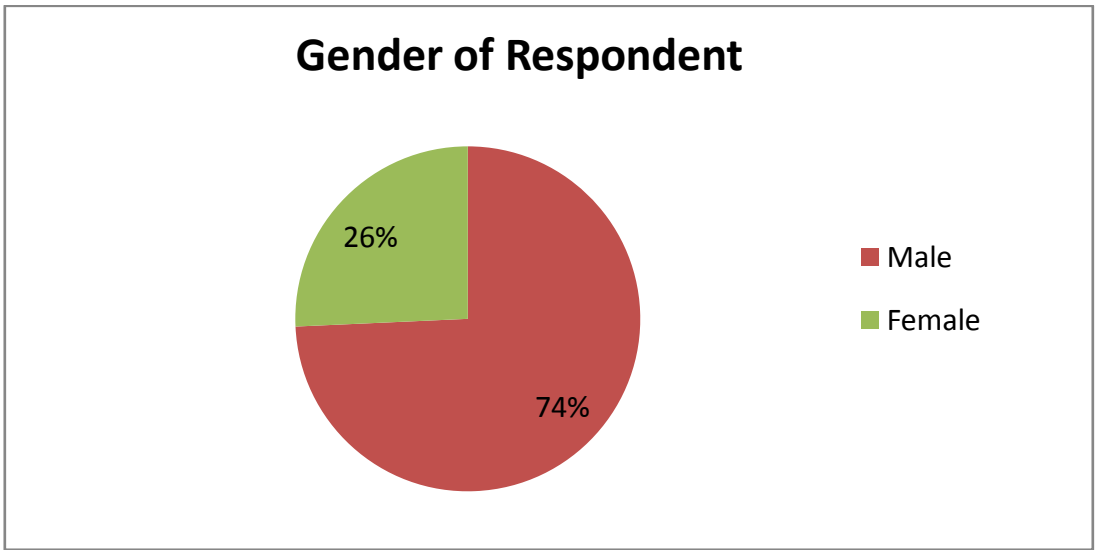

Figure 4.1: Gender of respondents

Table 4.3 and Figure 4.1 show that gender of respondents, in which it is divided into two groups, which are male and female. There are 74% or 26 male respondents and 26% or 9 female respondents participated in this research. There is less female working in construction industry; hence, the percentage of participation of female respondents is lower. The descriptive analysis of gender of respondents is expressed in terms of mean, median, mode, and standard deviation. For gender of respondents, the mean is 1.2571, the median is 1.0000, the mode is 1.00, and the standard deviation is 0.44344.

4.3.2 Current Position of Respondents

Table 4.4: Current position of respondents

Current Position of Respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Project Manager	9	25.7	25.7	25.7
	Civil Engineer	6	17.1	17.1	42.9
	Architect	1	2.9	2.9	45.7
	Quantity Surveyor	3	8.6	8.6	54.3
	Director	11	31.4	31.4	85.7
	Others	5	14.3	14.3	100.0
	Total	35	100.0	100.0	

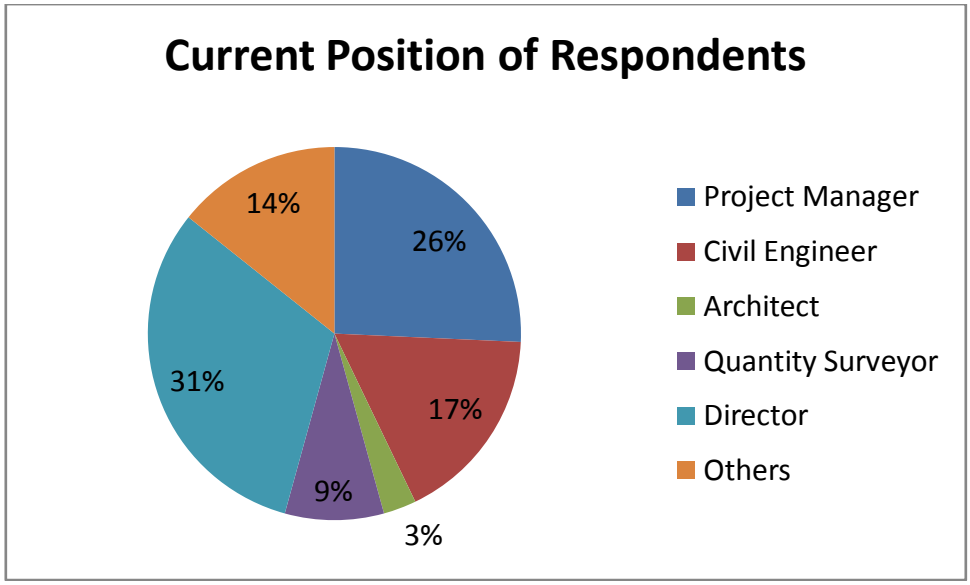

Figure 4.2: Current position of respondents

Table 4.4 and Figure 4.2 show the current position of respondents in the company. In this research, there are a wide range of people with different position answering the research questionnaire. The respondents can be categorized into six groups of people,

which are project manager, civil engineer, architect, quantity surveyor, company director, and others (i.e. assistant project manager, head of department, acting general manager, and design engineer). From the data collected, there are 26% or 9 project managers, 17% or 6 civil engineers, 3% or 1 architect, 9% or 3 quantity surveyors, 31% or 11 company directors, and 14.3% or 5 peoples with other positions as listed above. The descriptive analysis of the current position of respondents in the company is also expressed in terms of mean, median, mode, and standard deviation. For the current position of respondents in the company, the mean is 3.4571, the median is 4.0000, the mode is 5.00, and the standard deviation is 1.93030.

4.3.3 Qualification of Respondents

Table 4.5: Qualification of respondents

Qualification of Respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Bachelors Degree	28	80.0	80.0	80.0
	Masters Degree	6	17.1	17.1	97.1
	Others	1	2.9	2.9	100.0
	Total	35	100.0	100.0	

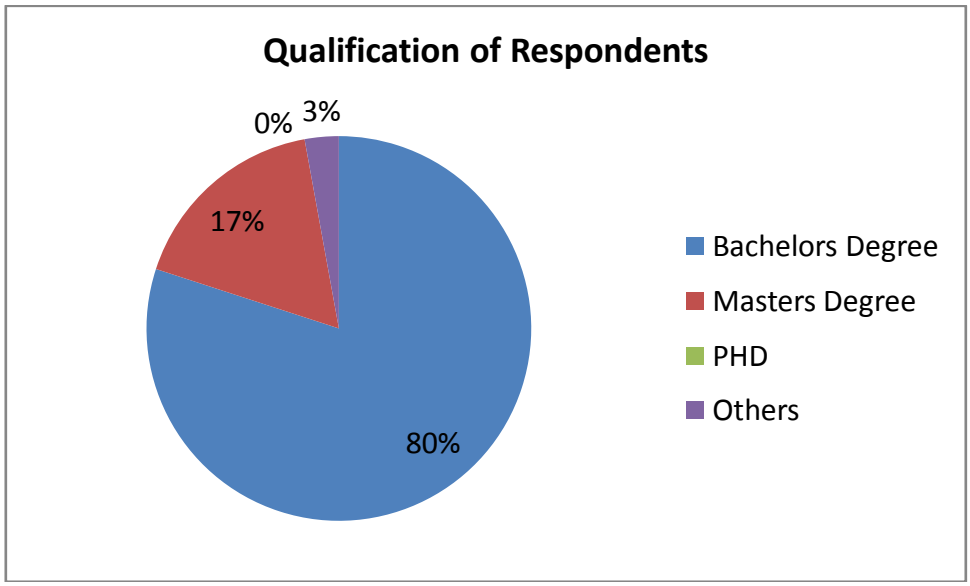

Figure 4.3: Qualification of respondents

Table 4.5 and Figure 4.3 show the qualification of respondents. The qualification of respondents can be divided into four categories, which are Bachelors Degree, Masters Degree, PHD, and others. There are 80% or 28 respondents are qualified with Bachelors Degree, which made up the largest part of the chart. Other than that, there are 17% or 6 respondents with the qualification of Masters Degree. However, there is no single one respondent with the qualification of PHD in taking part in this research. Last but no least, there is 3% or 1 respondent with other qualification that is not stated in the questionnaire, which is Diploma. The descriptive analysis of the qualification of respondents is also expressed in terms of mean, median, mode, and standard deviation. For the qualification of respondents, the mean is 1.2571, the median is 1.0000, the mode is 1.00, and the standard deviation is 0.61083.

4.3.4 Years of Experience of Respondents in Construction

Table 4.6: Years of experience of respondent in construction (years)

Years of Experience of Respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0-5 years	2	5.7	5.7	5.7
	6-10 years	9	25.7	25.7	31.4
	11-15 years	10	28.6	28.6	60.0
	16 and above years	14	40.0	40.0	100.0
	Total	35	100.0	100.0	

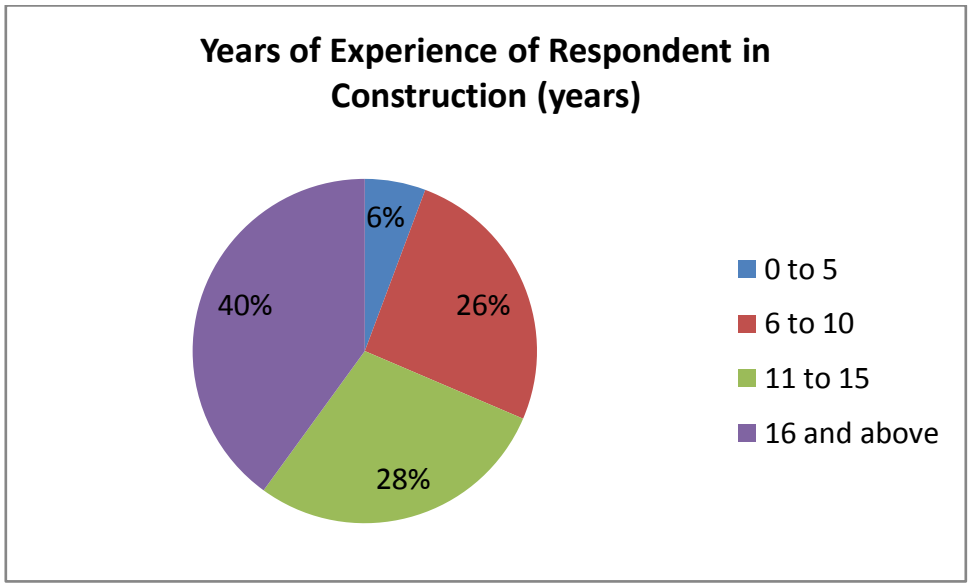

Figure 4.4: Years of experience of respondent in construction (years)

Table 4.6 and Figure 4.4 show the years of experience of respondent in construction. There are four categories that can be chosen by the respondents, which are 0 to5 years, 6 to10 years, 11 to 15 years, and 16 and above years. Out of 35 respondents, there are 6% or 2 respondents are newly employees, who have fewer experience, which is 0 to 5 years.

Furthermore, there are 26% or 9 respondents have 6 to 10 years experience in construction industry. Other than that, there are 28% or 10 respondents have 11 to 15 years of experience in construction industry. Last but not least, the remaining 40% or 14 respondents have 16 years and above of experience in construction industry, in which they are more knowledgeable and more experienced people compared to other groups of people. The descriptive analysis of the years of experience of respondents in construction is also expressed in terms of mean, median, mode, and standard deviation. For the years of experience of respondents in construction, the mean is 3.0286, the median is 3.0000, the mode is 4.00, and the standard deviation is 0.95442.

4.3.5 Types of Project Implemented by Respondents

Table 4.7: Types of Project Implemented by Respondents

Types of Project

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Residential Project	24	68.6	68.6	68.6
	Commercial Project	11	31.4	31.4	100.0
	Total	35	100.0	100.0	

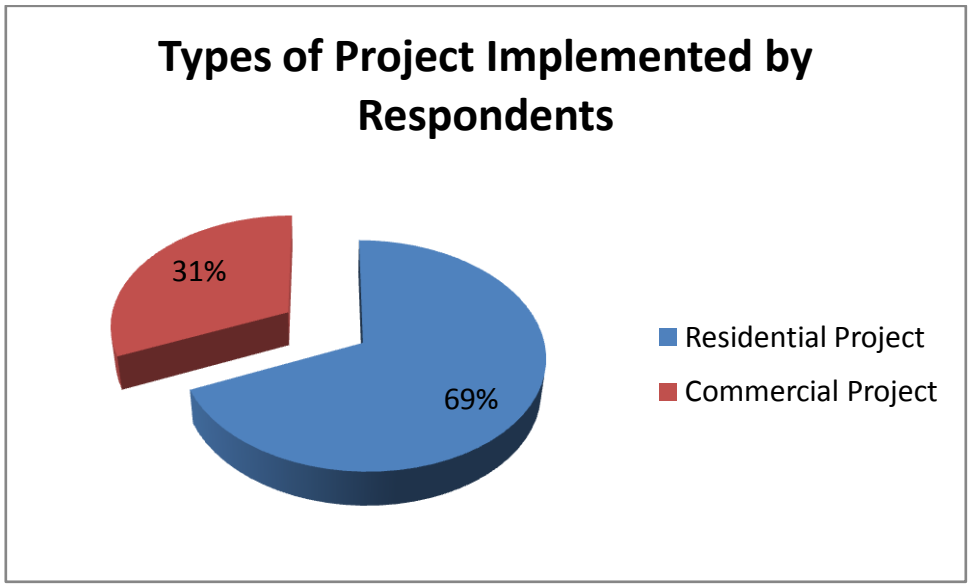

Figure 4.5: Types of project implemented by respondents

Table 4.7 and Figure 4.5 show that types of project implemented by respondents. There are 69% or 24 respondents involved in implementation of residential projects. On the other hands, there are 31% or 11 respondents involved in implementation of commercial projects.

4.3.6 Person who is Most Frequently Involved in the Preparation of Feasibility Study

Table 4.8: Person who is most frequently involved in the preparation of feasibility study

Statistics

	Architect	Civil Engineer	Valuation Surveyor	Quantity Surveyor	M &E Engineer	Town Planner	Project Manager, Director, and others
N Valid	35	35	35	35	35	35	35
Missing	0	0	0	0	0	0	0
Mean	.4286	.6571	.3429	.4571	.3429	.4286	.0857
Median	.0000	1.0000	.0000	.0000	.0000	.0000	.0000
Mode	.00	1.00	.00	.00	.00	.00	.00
Std. Deviation	.50210	.48159	.48159	.50543	.48159	.50210	.28403
Sum	15.00	23.00	12.00	16.00	12.00	15.00	3.00

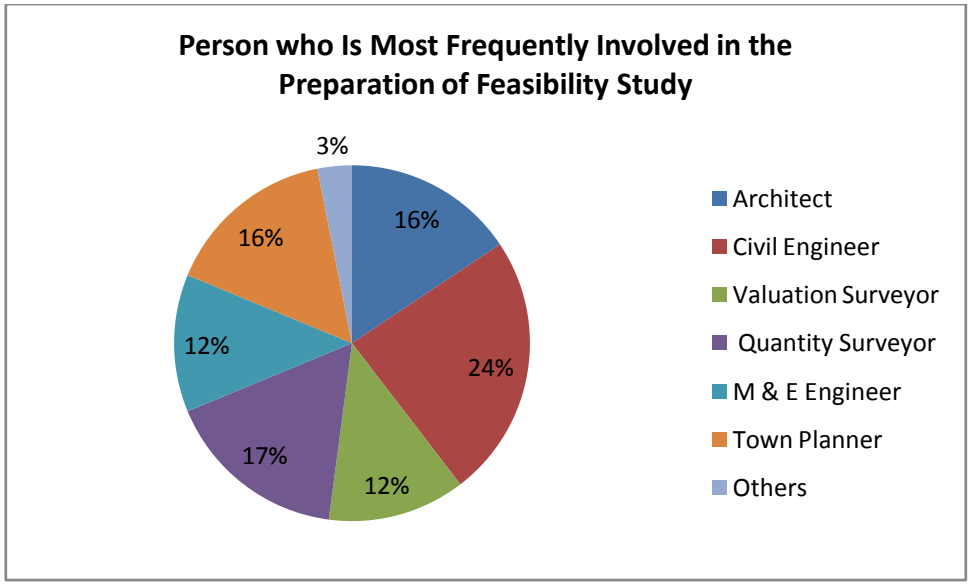

Figure 4.6: Person who is most frequently involved in the preparation of feasibility study

Table 4.8 and Figure 4.6 show the person who is most frequently involved in the preparation of feasibility study. From the data collection, there are seven categories of professionals involved in the preparation of feasibility study, which include architect, civil engineer, valuation surveyor, quantity surveyor, M & E engineer, town planner, and others (i.e. company director, project manager, and land surveyor). There are 16% or 15 respondents think that architect is one of the professionals involved in the preparation of feasibility study. Other than that, there are 24% or 23 respondents think that civil engineer is one of the professionals involved in the preparation of feasibility study. Besides that, there are 12% or 12 respondents think that valuation surveyor is one of the professionals involved in the preparation of feasibility study. Moreover, there are 17% or 16 respondents think that quantity surveyor is one of the professionals involved in the preparation of feasibility study. Furthermore, there are 12% or 12 respondents think that M & E Engineer is one of the professionals involved in the preparation of feasibility study. Next, there are 16% or 15 respondents think that town planner is one of the professionals involved in the preparation of feasibility study. Last but not least, the remaining 3% or 3 respondents think that other professionals (i.e. company director, project manager, and land surveyor) are one of the professionals involved in the preparation of feasibility study.

4.4 RELIABILITY ANALYSIS

Tavakol and Dennick (2011) stated that Cronbach's Alpha as an index of reliability, in which to test the reliability of research instrument – questionnaires. Cronbach's Alpha is a measure of internal consistency of scale, which is ranging from 0 to 1. In general, Cronbach's Alpha of 0.7 or higher is an acceptable level of reliability (Grau, 2007). Other than that, Bland (1997) also claimed that the satisfactory values of Cronbach's Alpha are ranging from 0.7 to 0.8. In addition, Radhakrishna (2007) asserted that coefficient of Cronbach's Alpha of 0.7 or higher is an appropriate level of reliability.

4.4.1 Reliability of Types of Abuses Occurred in Feasibility Study

Table 4.9: Reliability of types of abuses occurred in feasibility study

Variables	**Cronbach's Alpha**	**Number of Items (N)**	**Items Deleted**
Misleading use of feasibility study	0.700	4	0
Misunderstanding of study phases	0.727	3	0
Failure to undertake feasibility study that is fit for purpose	0.759	4	0

Table 4.9 shows the reliability of types of abuses occurred in feasibility study. There are three main variables in this section, which are misleading use of feasibility study, misunderstanding of study phases, and failure to undertake feasibility study that is fit for purpose. From the table above, the Cronbach's Alpha of misleading use of feasibility study is 0.700, in which there are four sub-variables in this main variable. For the variable of misunderstanding of study phases, the Cronbach's Alpha is 0.727, where there are three sub-variables under this main variable. On the other hands, for the variable of failure to undertake feasibility study that is fit for purpose, it has the Cronbach's Alpha of 0.759 where there are four sub-variables under this main variable. Since all of these three variables have Cronbach's Alpha of 0.700 and above, hence, there is no question being deleted.

4.4.2 Reliability of Causes of Abuses of Feasibility Study

Table 4.10: Reliability of causes of abuses of feasibility study

Variables	Cronbach's Alpha	Number of Items (N)	Items Deleted
Planning and estimation factors	0.706	6	0
Project external issues	0.836	3	0
Personnel factors	0.733	3	0
Developers' attitude	0.702	5	0

Table 4.10 shows the reliability of causes of abuses of feasibility study. In this section, there are four main variables, which include planning and estimation factors, project external issues, personnel factors, and developers' attitude. For the variable of planning and estimation factors, it has Cronbach's Alpha of 0.706 where there are six sub-variables under it. For the variable of project external issues, the Cronbach's Alpha is 0.836 and it is further divided into three sub-variables. For the variable of personnel factors, it has Cronbach's Alpha of 0.733 where there are three sub-variables under this main variable. Last but not least, the variable of developers' attitude has the Cronbach's Alpha of 0.702 where there are five sub-variables under it. Since four of these main variables have the Cronbach's Alpha of 0.700 and above, there is no need to delete any items under this section.

4.4.3 Reliability of Effects of Abuses of Feasibility Study

Table 4.11: Reliability of effects of abuses of feasibility study

Variables	Cronbach's Alpha	Number of Items (N)	Items Deleted
Cost-related effects	0.737	4	0
Time-related effects	0.700	4	0
Disputes	0.702	5	0
Client-related effects	0.782	4	0
Quality-related effects	0.700	4	0
Performance-related effects	0.734	4	0

Table 4.11 shows the reliability of effects of abuses of feasibility study. This section is categorized into six main variables, which are cost-related effects, time-related effects, disputes, client-related effects, quality-related effects, and performance-related effects. For the first main variable (cost-related effects), the coefficient of Cronbach's Alpha is 0.737, and there are four sub-variables under it. For the second main variable (time-related effect), it has the level of Cronbach's Alpha of 0.700 where there are four sub-variables under it. For the third main variable (disputes), the level of Cronbach's Alpha is 0.702 and it has five sub-variables under it. For the fourth main variable (client-related effects), the coefficient of Cronbach's Alpha is 0.782 where there are four sub-variables under it. For the fifth main variable (quality-related effects), it has the Cronbach's Alpha of 0.700 and it is further divided into four sub-variables. Last but not least, the sixth main variable (performance-related effect) has the level of Cronbach's Alpha of 0.734, in which there are four sub-variables under it. Since all of six main variables have the coefficient of Cronbach's Alpha of 0.700 and higher, there will be no items being deleted and all items are being kept.

4.5 NORMALITY TEST

Ghasemi and Zahediasl (2012) stated that Kolmogorov-Smirnov test and Shapiro-Wilk test are used for a smaller sample size, which are less than 50 respondents. Littlefors (1967) claimed that Kolmogorov-Smirnov test is used when the mean and variance of population are unknown or not specified. Hence, in this research, the Shapiro-Wilk test will be used for the purpose of normality test. Shapiro and Wilk (1965) asserted that the level of significance ($p > 0.05$), the data is normally distributed. The following sections will discuss more about the normality test of types of abuses occurred in feasibility study, causes of abuses of feasibility study, and effects of abuses of feasibility study.

4.5.1 Normality Test of Types of Abuses Occurred in Feasibility Study

Table 4.12: Normality test of types of abuses occurred in feasibility study

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Misleading use of feasibility study	.142	35	.073	.953	35	.136
Misunderstanding of Study Phases	.200	35	.001	.912	35	.008
Failure to Undertake Feasibility Study that is Fit for Purpose	.147	35	.054	.947	35	.091

a. Lilliefors Significance Correction

Table 4.12 shows the normality test of types of abuses occurred in feasibility study. As mentioned before, the Shapiro-Wilk test is only used for the purpose of normality test. Hence, the interpretation of data will only focus on the significance level (p-value) in the Shapiro-Wilk test. There are three types of abuses occurred in feasibility study, which include misleading use of feasibility study, misunderstanding of study phases, and failure to

undertake feasibility study that are fit for purpose. For the variable of misleading use of feasibility study, the p-value (level of significance) is 0.136. Since p-value > 0.05, the data is normally distributed. On the other hands, for the variable of misunderstanding of study phases, its p-value (level of significance) is 0.008. Since p-value < 0.05, the data is not normally distributed. Last but not least, the p-value (level of significance) of the variable of failure to undertake feasibility study that is fit for purpose is 0.091. Since p-value > 0.05, the data is normally distributed.

4.5.2 Normality Test of Causes of Abuses of Feasibility Study

Table 4.13: Normality test of causes of abuses of feasibility study

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Planning and Estimation Factors	.114	35	.200*	.973	35	.525
Project External Issues	.169	35	.012	.926	35	.021
Personnel Factors	.149	35	.049	.913	35	.009
Developers' Attitude	.226	35	.000	.916	35	.011

a. Lilliefors Significance Correction

*. This is a lower bound of the true significance.

Table 4.13 shows the normality test of causes of abuses of feasibility study. As mentioned before, the Shapiro-Wilk test is only used for the purpose of normality test. Hence, the interpretation of data will only focus on the significance level (p-value) in the Shapiro-Wilk test. There are four causes of abuses of feasibility study, which include planning and estimation factors, project external issues, personnel factors, and developers' attitude. For the variable of planning and estimation factor, the p-value (level of significance) is 0.525. Since p-value > 0.05, the data is normally distributed. On the other hands, for the variable of project external issues, its p-value (level of significance) is 0.021. Since p-value < 0.05, the data is not normally distributed. For the variable of personnel factors, the p-value (level of significance) is 0.009. Since p-value < 0.05, the data is not

normally distributed. Last but not least, the p-value (level of significance) of the variable of developers' attitude is 0.011. Since p-value < 0.05, the data is not normally distributed.

4.5.3 Normality Test of Effects of Abuses of Feasibility Study

Table 4.14: Normality test of effects of abuses of feasibility study

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Cost-related Effects	.129	35	.151	.957	35	.187
Time-related Effects	.171	35	.011	.928	35	.025
Disputes	.133	35	.123	.960	35	.232
Client-related Effects	.141	35	.077	.941	35	.058
Quality-related Effects	.122	35	.200*	.966	35	.353
Performance-related Effects	.170	35	.012	.946	35	.083

a. Lilliefors Significance Correction

*. This is a lower bound of the true significance.

Table 4.14 shows the normality test of effects of abuses of feasibility study. As mentioned before, the Shapiro-Wilk test is only used for the purpose of normality test. Hence, the interpretation of data will only focus on the significance level (p-value) in the Shapiro-Wilk test. There are six effects of abuses of feasibility study, which include cost-related effects, time-related effects, disputes, client-related effects, quality-related effects, and performance-related effects. For the variable of cost-related effects, the p-value (level of significance) is 0.187. Since p-value > 0.05, the data is normally distributed. On the other hands, for the variable of time-related effects, its p-value (level of significance) is 0.025. Since p-value < 0.05, the data is not normally distributed. For the variable of disputes, the p-value (level of significance) is 0.232. Since p-value > 0.05, the data is normally distributed. Other than that, the p-value (level of significance) of the variable of client-related effects is 0.058. Since p-value > 0.05, the data is normally distributed. Apart from that, the p-value (level of significance) of the variable of quality-related effects is

0.353. Since p-value > 0.05, the data is normally distributed. Last but not least, the p-value (level of significance) of the variable of performance-related effects is 0.083. Since p-value > 0.05, the data is normally distributed.

4.6 TYPES OF ABUSES OCCURRED IN FEASIBILITY STUDY

In this research, there are three types of abuses occurred in feasibility study be surveyed. These three types of abuses occurred in feasibility study include misleading use of feasibility study, misunderstanding of study phases, and failure to undertake feasibility study that is fit for purpose. The following sections will discuss about the mean of the types of abuses occurred in feasibility study, which is expressed in terms of percentage.

4.6.1 Misleading Use of Feasibility Study

Table 4.15: Misleading Use of Feasibility Study

Statistics

		Do not carry out feasibility study properly	Deliberately fraudulent occurred in feasibility study	Do not follow governmental rules and regulations	Ignoring some aspects of contractual requirement
N	Valid	35	35	35	35
	Missing	0	0	0	0
Mean		3.7143	2.9429	3.3429	2.9429
Overall Mean		3.2358			

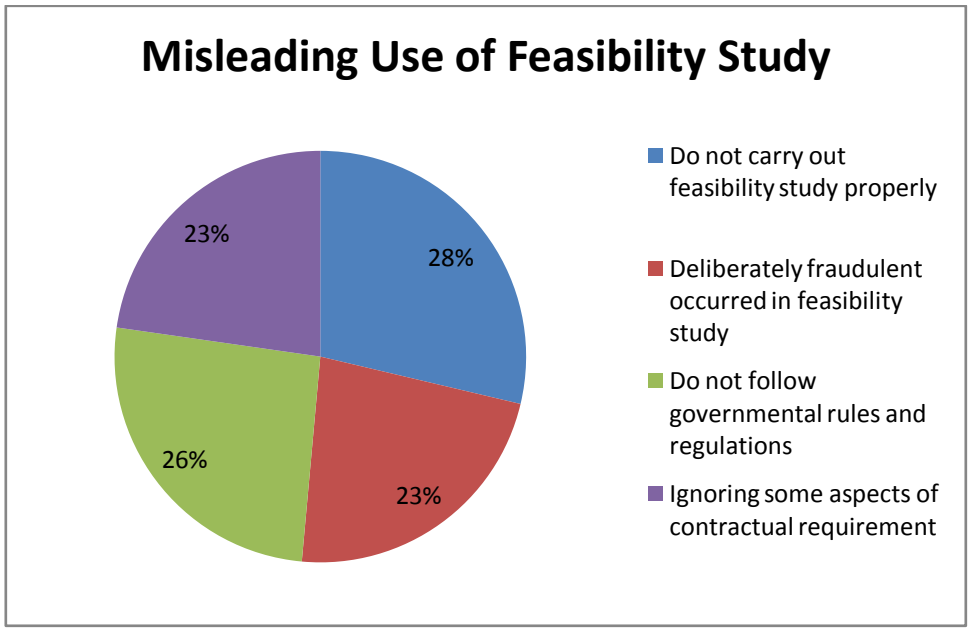

Figure 4.7: Misleading use of feasibility study

Table 4.15 and Figure 4.7 show the mean of misleading use of feasibility study. It is divided into four sub-variables, which include do not carry out feasibility study properly, deliberately fraudulent occurred in feasibility study, do not follow governmental rules and regulations, and ignoring some aspects of contractual requirement. The mean of sub-variable of do not carry out feasibility study properly is 3.7143 or 28%. For the sub-variable of deliberately fraudulent occurred in feasibility study, its mean is 2.9429 or 23%. For the sub-variable of do not follow governmental rules and regulations, its mean is 3.3429 or 26%. Last but not least, for the sub-variable of ignoring some aspects of contractual requirement, its mean is 2.9429 or 23%.

4.6.2 Misunderstanding of Study Phases

Table 4.16: Misunderstanding of study phases

Statistics

		Misunderstanding of conceptual/scoping study (phase 1)	Misunderstanding of prefeasibility study (phase 2)	Misunderstanding of full feasibility study (phase 3)
N	Valid	35	35	35
	Missing	0	0	0
Mean		3.3714	3.2571	3.2286
Overall Mean		3.2857		

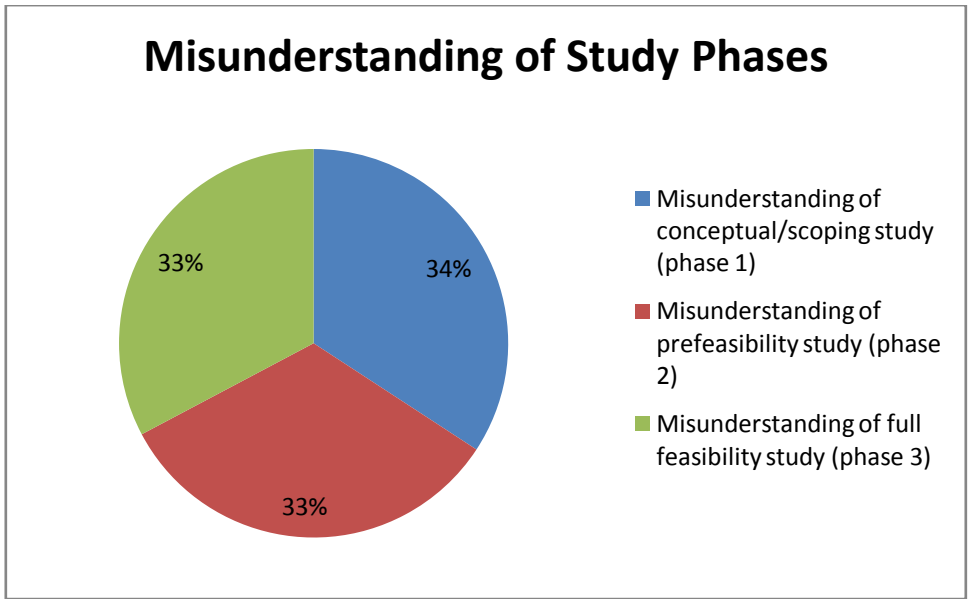

Figure 4.8: Misunderstanding of study phases

Table 4.16 and Figure 4.8 show the mean of misunderstanding of study phases. It is divided into three sub-variables, which include misunderstanding of conceptual or scoping study (phase 1), misunderstanding of prefeasibility study (phase 2), and misunderstanding of full feasibility study (phase3). The mean of sub-variable of misunderstanding of

conceptual or scoping study (phase 1) is 3.3714 or 34%. For the sub-variable of misunderstanding of prefeasibility study (phase 2), its mean is 3.2571 or 33%. Last but not least, for the sub-variable of misunderstanding of full feasibility study (phase3), its mean is 3.2286 or 34%.

4.6.3 Failure to Undertake Feasibility Study that is fit for Purpose

Table 4.17: Failure to undertake feasibility study that is fit for purpose

Statistics

		Misunderstanding of the objective of feasibility study	Failure to achieve minimum standard of feasibility study	Inaccurately measure the potential of project	Negligence in identifying the features of project
N	Valid	35	35	35	35
	Missing	0	0	0	0
Mean		3.4857	3.3714	3.8286	3.7714
Overall Mean		3.6143			

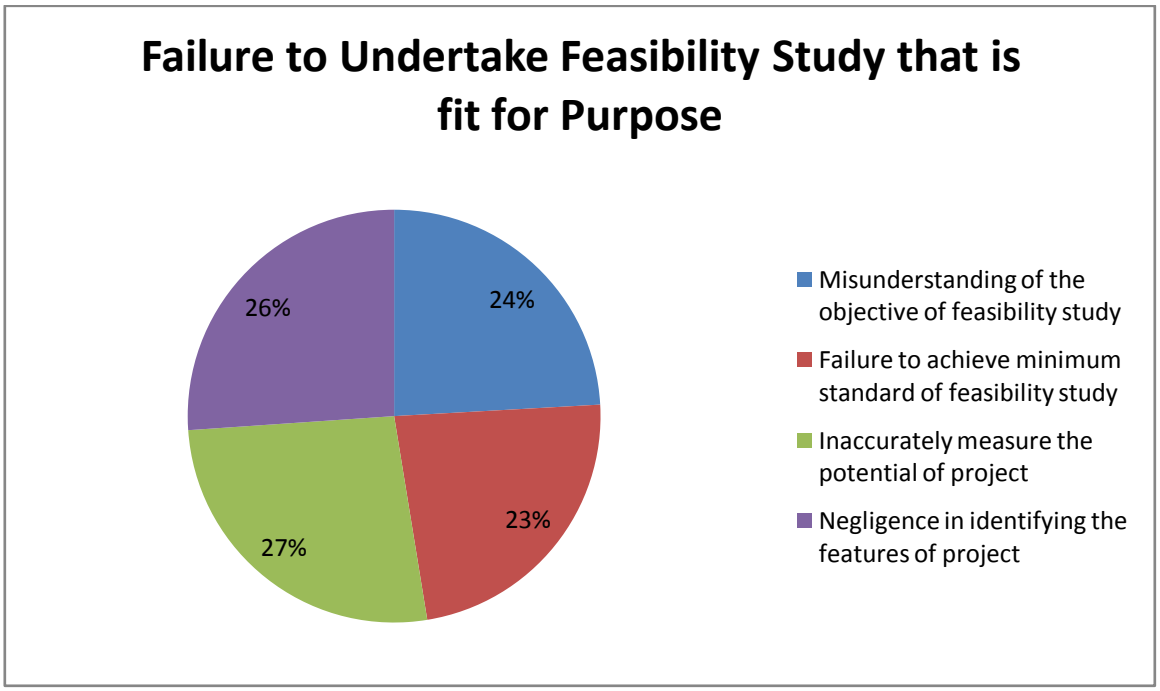

Figure 4.9: Failure to undertake feasibility study that is fit for purpose

Table 4.17 and Figure 4.9 show the mean of failure to undertake feasibility study that is fit for purpose. Under this main variable, there are four sub-variables, which include misunderstanding of objective of feasibility study, failure to achieve minimum standard of feasibility study, inaccurately measure the potential of project, and negligence in identifying the features of project. The mean of sub-variable of misunderstanding of objective of feasibility study is 3.4857 or 24%. For the sub-variable of failure to achieve minimum standard of feasibility study, its mean is 3.3714 or 23%. For the sub-variable of inaccurately measure the potential of project, its mean is 3.8286 or 27%. Last but not least, for the sub-variable of negligence in identifying the features of project, its mean is 3.7714 or 26%.

4.7 CAUSES OF ABUSES OF FEASIBILITY STUDY

There are four main groups of causes of abuses of feasibility study. The four main groups that contribute to abuses of feasibility study include planning and estimation factors, project external issues, personnel factors, and developers' attitude. These causes of abuses of feasibility study are presented in terms of their means and are ranked according to their means as summarized in Table 4.53. The following sections will discuss in more detailed about the means of each group of causes of abuses of feasibility study.

4.7.1 Planning and Estimation Factors

Table 4.18: Means of planning and estimation factors

Statistics

	Poor skills of making assumptions of resources	Lack of information of market demand	Poor cost and revenue estimate	Poor time estimate	Poor forecasting of cash flow	Lack of land information
N Valid	35	35	35	35	35	35
Missing	0	0	0	0	0	0
Mean	3.7714	3.8000	3.5714	3.8000	3.2571	3.5714
Overall Mean	3.6286					

Table 4.18 shows the means of main variable of planning and estimation factors. According to the data collection from 35 respondents, there are two sub-variables with the highest mean score in which these two sub-variables (lack of information of market demand and poor time estimate) are having the same mean score, which are 3.8000. Next, the second highest mean score is belonged to sub-variable of poor skills of making assumptions of resources, in which its mean is 3.7714. Apart from that, the third highest mean score is 3.5714, in which there are two sub-variables having the same mean score.

These two sub-variables are poor cost and revenue estimate and lack of land information. Last but not least, the lowest mean score is 3.2571, in which it is belonged to the sub-variable of poor forecasting of cash flow. The overall mean of this main variable of planning and estimation factors is 3.6286.

4.7.2 Project External Issues

Table 4.19: Means of Project External Issues

Statistics

		Lack of sustainability concern	Lack of concern for legal issues	Lack of concern for community stakeholders
N	Valid	35	35	35
	Missing	0	0	0
Mean		3.5429	3.5143	3.3143
Overall Mean		3.4571		

Table 4.19 shows the means of main variable of project external issues. There are three sub-variables under this main variable, which include lack of sustainability concern, lack of concern for legal issues, and lack of concern for community stakeholders. The sub-variable of lack of sustainability concern has the highest mean score, where its mean is 3.5429. Followed by the sub-variable of lack of concern for legal issues, in which its mean is 3.5143 (the second highest mean score). Last but not least, the lowest mean score is 3.3143 where it is scored by sub-variable of lack of concern for community stakeholders. The overall mean for the main variable of project external issues is 3.4571.

4.7.3 Personnel Factors

Table 4.20: Means of personnel factors

Statistics

	Lack of communication	Lack of adequate team members to carry out feasibility study	Lack of cooperation from top management (lack of firm decision deadlines)
N Valid	35	35	35
Missing	0	0	0
Mean	4.0000	4.1714	3.6286
Overall Mean	3.9333		

Table 4.20 shows the means of personnel factors. Under the main variable of personnel factors, there are three sub-variables, which include lack of communication, lack of adequate team members to carry out feasibility study, and lack of cooperation from top management (lack of firm decision deadlines). The sub-variable of lack of adequate team members to carry out feasibility study has the highest mean score, in which its mean is 4.1714. The second highest mean score under this main variable is 4.0000, in which it is belonged to sub-variable of lack of communication. Last but not least, the sub-variable of lack of cooperation from top management (lack of firm decision deadlines) obtained the lowest mean score, where it is 3.6286. The overall mean of the main variable of personnel factors is 3.9333.

4.7.4 Developers' Attitude towards Preparation of Feasibility Study

Table 4.21: Means of developers' attitude

Statistics

		Lack of time to carry out feasibility study	Failure to progress through study phases	Failure to plan for next study phases	Failure to recycle through the study phases	Failure to fix study scope
N	Valid	35	35	35	35	35
	Missing	0	0	0	0	0
Mean		3.4857	3.4857	3.4571	3.3714	3.3143
Overall Mean		3.4229				

Table 4.21 shows the means of developers' attitude. Under the main variable of developers' attitude, there are five sub-variables which include lack of time to carry out the feasibility study, failure to progress through the study phases, failure to plan for next study phases, failure to recycle through the study phases, and failure to fix the study scope. In this group of main variable, the sub-variables of lack of time to carry out feasibility study and failure to progress through the study phases obtain the highest score, where their means are 3.4857. The second highest mean score is 3.4571 where it is belonged to the sub-variable of failure to plan for next study phases. Next, the sub-variable of failure to recycle through the study phases has the third highest mean score of 3.3714. Last but not least, the sub-variable of failure to fix study has the lowest mean score of 3.3143. The overall mean for the main variable of developers' attitude is 3.4229.

4.8 EFFECTS OF ABUSES OF FEASIBILITY STUDY

There are six main variables of effects of abuses of feasibility study, which include cost-related effects, time-related effects, disputes, client-related effects, quality-related effects, and performance-related effects. These effects of abuses of feasibility study are

presented in terms of their means and are ranked according to their means as summarized in Table 4.54. The following sections will discuss in more detailed about the means of each group of effects of abuses of feasibility study.

4.8.1 Cost-related Effects

Table 4.22: Means of cost-related effects

Statistics

		Increased in labor cost	Increased in material and equipment cost	Increased in indirect cost	Monetary penalties
N	Valid	35	35	35	35
	Missing	0	0	0	0
Mean		4.1714	4.0286	3.7429	3.4857
Overall Mean		3.8571			

Table 4.22 shows the means of main variable of cost-related effects. There are four sub-variables under this main variable, which include increased in labor cost, increased in material and equipment cost, increased in indirect cost, and monetary penalties. From the data analysis of 35 respondents, the sub-variable of increased in labor cost has the highest mean score of 4.1714. Next, the sub-variable of increased in material and equipment cost has the second highest mean score of 4.0286. Followed by sub-variable of increased in indirect cost, it has the third highest mean score of 3.7429. Last but not least, the sub-variable of monetary penalties has the lowest mean score of 3.4857. The overall mean of the main variable of cost-related effects is 3.8571.

4.8.2 Time-related Effects

Table 4.23: Means of time-related effects

Statistics

		Project delay	Delay in feasibility study	Procurement delay	Delay in payment to contractor and workers
N	Valid	35	35	35	35
	Missing	0	0	0	0
Mean		4.2000	3.8286	3.6571	3.5143
Overall Mean		3.8000			

Table 4.23 shows the means of time-related effects. Within this main variable, there are further divided into four sub-variables, which include project delay, delay in feasibility study, procurement delay, and delay in payment to contractor and workers. According to data collection and interpretation from 35 respondents, the sub-variable of project delay has the highest mean score of 4.2000. Whereas for the second highest mean score, it is belonged to sub-variable of delay in feasibility study, in which it has mean of 3.8286. The third highest mean score is 3.6571 where it is scored by the sub-variable of procurement delay. Last but not least, the lowest mean score is belonged to sub-variable of delay in payment to contractor and workers in which its mean is 3.5143. The overall mean the main variable of time-related effects is 3.8000.

4.8.3 Disputes

Table 4.24: Means of disputes

Statistics

	Conflict with project clients	Conflict with community stakeholders	Conflict with contractors and subcontractors	Conflict with construction workers	Conflict with local and national authorities
N Valid	35	35	35	35	35
Missing	0	0	0	0	0
Mean	3.7143	3.3714	3.4571	3.1714	2.8571
Overall Mean	3.3143				

Table 4.24 shows the means of disputes. The main variable of disputes had been further divided into five sub-variables, which are conflict with project clients, conflict with community stakeholders, conflict with contractors and subcontractors, conflict with construction workers, and conflict with local and national authorities. Out of 35 respondents, the sub-variable of conflict with project clients has the highest mean score of 3.7143. Apart from that, the sub-variable of conflict with contractors and subcontractors has the second highest mean score of 3.4571. On the other hands, the sub-variables of conflict with community stakeholders and conflict with construction workers have the third and fourth highest mean score, in which their means are 3.3714 and 3.1714 respectively. Last but not least, the sub-variable of conflict with local and national authorities has the lowest mean, where its mean is 2.8571. The overall mean of the main variable of disputes is 3.3143.

4.8.4 Client-related Effects

Table 4.25: Means of client-related effects

Statistics

		Make wrong investment decision	Profit loss	Pay additional cost for changing contract requirement	Delay in client decision making
N	Valid	35	35	35	35
	Missing	0	0	0	0
Mean		4.2000	4.2286	3.5429	3.8571
Overall Mean		3.9571			

Table 4.25 shows the means of client-related effects. The main variable of client-related effects has four sub-variables, which are making wrong investment decision, profit loss, paying additional cost for changing contract requirement, and delay in client decision making. Based on the data obtained from 35 respondents, the sub-variable of profit loss has the highest mean, which are 4.2286. In contrast, the sub-variable of making wrong investment decision has the second highest means score of 4.2000. Followed by the sub-variable of delay in client decision making, it has mean of 3.8571 which is third highest score. Last but not least, the sub-variable of paying additional cost for changing contract requirement has the lowest mean score of 3.5429. The overall mean of main variable of client-related effects is 3.9571.

4.8.5 Quality-related Effects

Table 4.26: Means of quality-related effects

Statistics

		Poor quality of feasibility study: Produce poor result	Low quality of project	Increase project risk	Affect reputation of performing organization
N	Valid	35	35	35	35
	Missing	0	0	0	0
Mean		3.8857	3.7714	3.5429	3.6000
Overall Mean		3.7000			

Table 4.26 shows the means of quality-related effects. Under this main variable, there are four sub-variables, which include poor quality of feasibility study (producing poor result), low quality of project, increasing project risk, and affecting the reputation of performing organization. Based on the data collected from 35 respondents, the sub-variable of poor quality of feasibility study (producing poor result) has the highest mean score of 3.8857. On the other hands, the sub-variables of low quality of project and affecting the reputation of performing organization have the second and third highest of means, where their means are 3.7714 and 3.6000 respectively. Last but not least, the sub-variable of increasing project risk has the lowest mean score of 3.5429. The overall mean of the main variable of quality-related effects is 3.7000.

4.8.6 Performance-related Effects

Table 4.27: Means of performance-related effects

Statistics

		Poor performance of project	Project failure: Uncompleted building	Poor performance of workers	Low sales of constructed building
N	Valid	35	35	35	35
	Missing	0	0	0	0
Mean		3.8000	3.4571	3.3429	3.9714
Overall Mean		3.6429			

Table 4.27 shows the means of performance-related effects. This main variable has four sub-variables, which include poor performance of project, project failure or uncompleted building, poor performance of workers, and low sales of constructed building. Out of 35 respondents, the results shown that the highest mean is 3.9714, which is belonged to sub-variable of low sales of constructed building. Whereas for the second and third highest means score, the sub-variables are poor performance of project and project failure or uncompleted building with the means of 3.8000 and 3.4571 respectively. Last but not least, the sub-variable of poor performance of workers has the lowest mean score of 3.3429. The overall mean of the main variable of performance-related effects is 3.6429.

4.9 CORRELATION BETWEEN CAUSES AND EFFECTS OF ABUSES OF FEASIBILITY STUDY (PEARSON CORRELATION)

There are several Pearson correlation coefficients which measure the relationship between four groups of causes of abuses of feasibility study and six groups of effects of abuses of feasibility study. All of the relationships between different groups of causes and effects of abuses of feasibility study will be discussed in more detailed in the form of fishbone diagram (as shown in section 4.9.5). Table 4.28 shows the interpretation of

Pearson correlation coefficient. The Pearson correlation coefficients are ranging from -1 to +1. According to Saha and Paul (2010), Pearson correlation coefficient from -1 to -0.7 represents strong negative correlation; from -0.7 to -0.4 represents moderate negative correlation; from -0.4 to -0.2 represents weak negative correlation; and from -0.2 to -0.01 represents negligible. For zero Pearson correlation coefficient, it brings a meaning of no correlation. On the other hands, from 0.01 to 0.2 means that negligible; from 0.2 to 0.4 means that weak positive correlation; from 0.4 to 0.7 means that moderate positive correlation; and from 0.7 to 1 means that strong positive correlation.

Table 4.28: Pearson correlation coefficient

Scale	**Correlation sign**
- 1 < r < -0.7	Strong negative
-0.7 < r < -0.4	Moderate negative
-0.4 < r < -0.2	Weak negative
-0.2 < r < -0.01	Negligible
0	No correlation
0.01 < r < 0.2	Negligible
0.2 < r < 0.4	Weak positive
0.4 < r < 0.7	Moderate positive
0.7 < r < 1	Strong positive

Source: Saha, I. and Paul, B. 2010. *Biostatistics MCQ and Essentials*. Kolkata: B.K.Dhur of Academic Publishers.

In this research, there are many-to-many relationship between causes of abuses of feasibility study and effects of abuses of feasibility study. Figure 4.10 shows the many-to-many relationship between causes of abuses of feasibility study and effects of abuses of feasibility study.

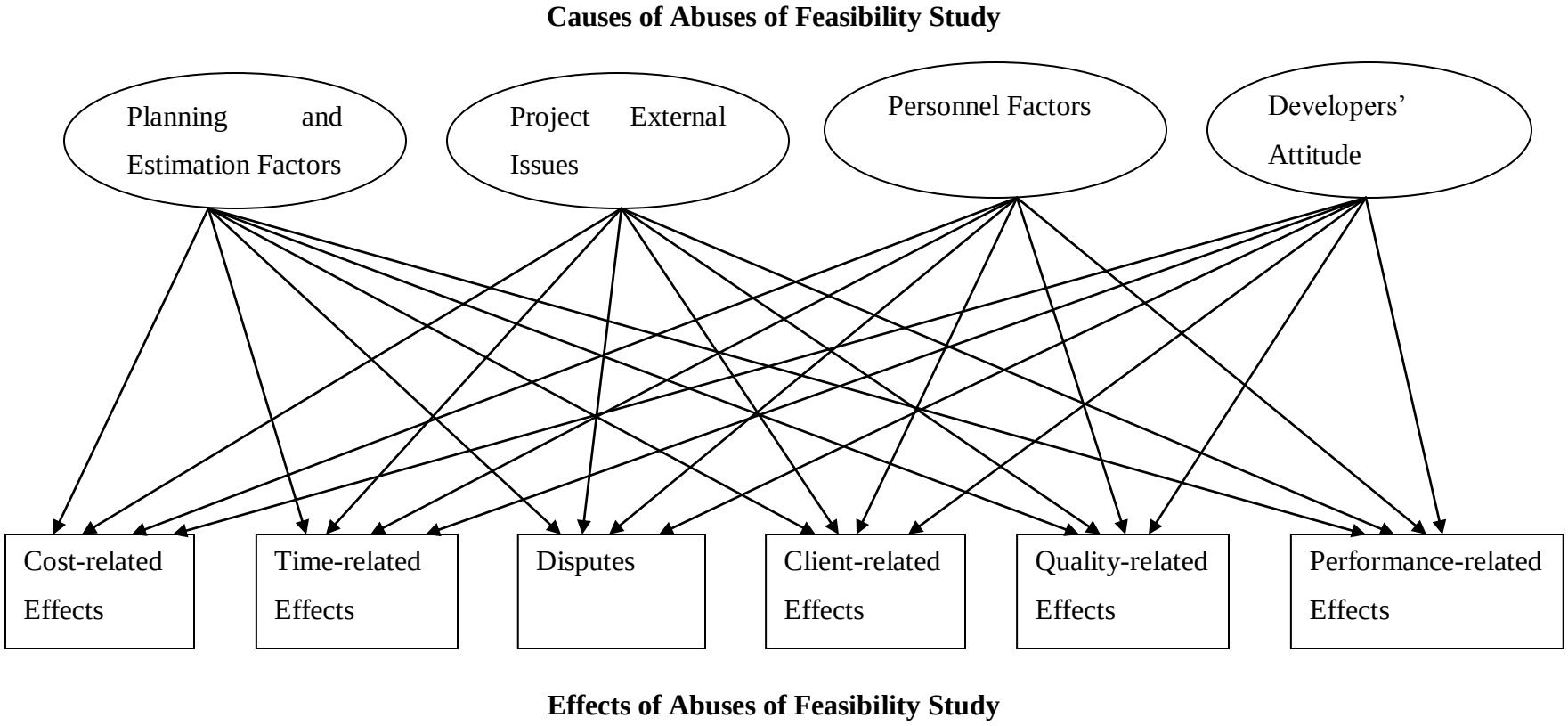

Figure 4.10: Many-to-many relationship between causes and effects of abuses of feasibility study

4.9.1 Relationship between Planning and Estimation Factors and All Groups of Effects of Abuses of Feasibility Study

The following section will discuss about the relationship between planning and estimation factors and cost-related effects; relationship between planning and estimation factors and time-related effects; relationship between planning and estimation factors and disputes; relationship between planning and estimation factors and client-related effects; relationship between planning and estimation factors and quality -related effects; and relationship between planning and estimation factors and performance-related effects.

4.9.1.1 Correlation between Planning and Estimation Factors and Cost-related Effects

Table 4.29: Correlation between planning and estimation factors and cost-related effects

Correlations

		Planning and Estimation Factor	Cost-related Effect
Planning and Estimation Factor	Pearson Correlation	1	.194
	Sig. (2-tailed)		.264
	N	35	35
Cost-related Effect	Pearson Correlation	.194	1
	Sig. (2-tailed)	.264	
	N	35	35

Table 4.29 shows the correlation between planning and estimation factors and cost-related effects. The Pearson correlation coefficient, r is 0.194. There is negligible relationship between planning and estimation factors and cost-related effects. There is no significant relationship between the planning and estimation factors and cost-related effects.

4.9.1.2 Correlation between Planning and Estimation Factors and Time-related Effects

Table 4.30: Correlation between planning and estimation factors and time-related effects

Correlations

		Planning and Estimation Factor	Time-related Effect
Planning and Estimation Factor	Pearson Correlation	1	.287
	Sig. (2-tailed)		.095
	N	35	35
Time-related Effect	Pearson Correlation	.287	1
	Sig. (2-tailed)	.095	
	N	35	35

Table 4.30 shows the correlation between planning and estimation factors and time-related effects. The Pearson correlation coefficient, r is 0.287. There is weak positive relationship between planning and estimation factors and time-related effects. There is no significant relationship between the planning and estimation factors and time-related effects.

4.9.1.3 Correlation between Planning and Estimation Factors and Disputes

Table 4.31: Correlation between planning and estimation factors and disputes

Correlations

		Planning and Estimation Factor	Disputes
Planning and Estimation Factor	Pearson Correlation	1	.316
	Sig. (2-tailed)		.064
	N	35	35
Disputes	Pearson Correlation	.316	1
	Sig. (2-tailed)	.064	
	N	35	35

Table 4.31 shows the correlation between planning and estimation factors and disputes. The Pearson correlation coefficient, r is 0.316. There is weak positive relationship between planning and estimation factors and disputes. There is no significant relationship between the planning and estimation factors and disputes.

4.9.1.4 Correlation between Planning and Estimation Factors and Client-related Effects

Table 4.32: Correlation between planning and estimation factors and client-related effects

Correlations

		Planning and Estimation Factor	Client-related Effect
Planning and Estimation Factor	Pearson Correlation	1	.197
	Sig. (2-tailed)		.257
	N	35	35
Client-related Effect	Pearson Correlation	.197	1
	Sig. (2-tailed)	.257	
	N	35	35

Table 4.32 shows the correlation between planning and estimation factors and client-related effects. The Pearson correlation coefficient, r is 0.197. There is negligible relationship between planning and estimation factors and client-related effects. There is no significant relationship between the planning and estimation factors and client-related effects.

4.9.1.5 Correlation between Planning and Estimation Factors and Quality-related Effects

Table 4.33: Correlation between planning and estimation factors and quality-related effects

Correlations

		Planning and Estimation Factor	Quality-related Effect
Planning and Estimation Factor	Pearson Correlation	1	.055
	Sig. (2-tailed)		.755
	N	35	35
Quality-related Effect	Pearson Correlation	.055	1
	Sig. (2-tailed)	.755	
	N	35	35

Table 4.33 shows the correlation between planning and estimation factors and quality-related effects. The Pearson correlation coefficient, r is 0.055. There is negligible relationship between planning and estimation factors and quality-related effects. There is no significant relationship between the planning and estimation factors and quality-related effects.

4.9.1.6 Correlation between Planning and Estimation Factors and Performance-related Effects

Table 4.34: Correlation between Planning and Estimation Factors and Performance-related Effects

Correlations

		Planning and Estimation Factor	Performance-related Effect
Planning and Estimation Factor	Pearson Correlation	1	.046
	Sig. (2-tailed)		.792
	N	35	35
Performance-related Effect	Pearson Correlation	.046	1
	Sig. (2-tailed)	.792	
	N	35	35

Table 4.34 shows the correlation between planning and estimation factors and performance-related effects. The Pearson correlation coefficient, r is 0.046. There is negligible relationship between planning and estimation factors and performance-related effects. There is no significant relationship between the planning and estimation factors and performance-related effects.

4.9.2 Relationship between Project External Issues and All Groups of Effects of Abuses of Feasibility Study

The following section will discuss about the relationship between project external issues and cost-related effects; relationship between project external issues and time-related effects; relationship between project external issues and disputes; relationship between project external issues and client-related effects; relationship between project external

issues and quality -related effects; and relationship between project external issues and performance-related effects.

4.9.2.1 Correlation between Project External Issues and Cost-related Effects

Table 4.35: Correlation between project external issues and cost-related effects

Correlations

		Project External Issue	Cost-related Effect
Project External Issue	Pearson Correlation	1	.079
	Sig. (2-tailed)		.653
	N	35	35
Cost-related Effect	Pearson Correlation	.079	1
	Sig. (2-tailed)	.653	
	N	35	35

Table 4.35 shows the correlation between project external issues and cost-related effects. The Pearson correlation coefficient, r is 0.079. There is negligible relationship between project external issues and cost-related effects. There is no significant relationship between the project external issues and cost-related effects.

4.9.2.2 Correlation between Project External Issues and Time-related Effects

Table 4.36: Correlation between project external issues and time-related effects

Correlations

		Project External Issue	Time-related Effect
Project External Issue	Pearson Correlation	1	.426*
	Sig. (2-tailed)		.011
	N	35	35
Time-related Effect	Pearson Correlation	.426*	1
	Sig. (2-tailed)	.011	
	N	35	35

*. Correlation is significant at the 0.05 level (2-tailed).

Table 4.36 shows the correlation between project external issues and time-related effects. The Pearson correlation coefficient, r is 0.426. There is moderate positive relationship between project external issues and time-related effects. There is significant relationship between the project external issues and time-related effects at the 0.05 level.

4.9.2.3 Correlation between Project External Issues and Disputes

Table 4.37: Correlation between project external issues and disputes

Correlations

		Project External Issue	Disputes
Project External Issue	Pearson Correlation	1	.388*
	Sig. (2-tailed)		.021
	N	35	35
Disputes	Pearson Correlation	.388*	1
	Sig. (2-tailed)	.021	
	N	35	35

*. Correlation is significant at the 0.05 level (2-tailed).

Table 4.37 shows the correlation between project external issues and disputes. The Pearson correlation coefficient, r is 0.388. There is weak positive relationship between project external issues and disputes. There is significant relationship between the project external issues and disputes at the 0.05 level.

4.9.2.4 Correlation between Project External Issues and Client-related Effects

Table 4.38: Correlation between project external issues and client-related effects

Correlations

		Project External Issue	Client-related Effect
Project External Issue	Pearson Correlation	1	.313
	Sig. (2-tailed)		.067
	N	35	35
Client-related Effect	Pearson Correlation	.313	1
	Sig. (2-tailed)	.067	
	N	35	35

Table 4.38 shows the correlation between project external issues and client-related effects. The Pearson correlation coefficient, r is 0.313. There is weak positive relationship between project external issues and client-related effects. There is no significant relationship between the project external issues and client-related effects.

4.9.2.5 Correlation between Project External Issues and Quality-related Effects

Table 4.39: Correlation between project external issues and quality-related effects

Correlations

		Project External Issue	Quality-related Effect
Project External Issue	Pearson Correlation	1	.037
	Sig. (2-tailed)		.833
	N	35	35
Quality-related Effect	Pearson Correlation	.037	1
	Sig. (2-tailed)	.833	
	N	35	35

Table 4.39 shows the correlation between project external issues and quality-related effects. The Pearson correlation coefficient, r is 0.037. There is negligible relationship between project external issues and quality-related effects. There is no significant relationship between the project external issues and quality-related effects.

4.9.2.6 Correlation between Project External Issues and Performance-related Effects

Table 4.40: Correlation between project external issues and performance-related effects

Correlations

		Project External Issue	Performance-related Effect
Project External Issue	Pearson Correlation	1	.244
	Sig. (2-tailed)		.158
	N	35	35
Performance-related Effect	Pearson Correlation	.244	1
	Sig. (2-tailed)	.158	
	N	35	35

Table 4.40 shows the correlation between project external issues and performance-related effects. The Pearson correlation coefficient, r is 0.244. There is weak positive relationship between project external issues and performance-related effects. There is no significant relationship between the project external issues and performance-related effects.

4.9.3 Relationship between Personnel Factors and All Groups of Effects of Abuses of Feasibility Study

The following section will discuss about the relationship between personnel factors and cost-related effects; relationship between personnel factors and time-related effects; relationship between personnel factors and disputes; relationship between personnel factors

and client-related effects; relationship between personnel factors and quality -related effects; and relationship between personnel factors and performance-related effects.

4.9.3.1 Correlation between Personnel Factors and Cost-related Effects

Table 4.41: Correlation between personnel factors and cost-related effects

Correlations

		Personnel Factor	Cost-related Effect
Personnel Factor	Pearson Correlation	1	.284
	Sig. (2-tailed)		.098
	N	35	35
Cost-related Effect	Pearson Correlation	.284	1
	Sig. (2-tailed)	.098	
	N	35	35

Table 4.41 shows the correlation between personnel factors and cost-related effects. The Pearson correlation coefficient, r is 0.284. There is weak positive relationship between personnel factors and cost-related effects. There is no significant relationship between the personnel factors and cost-related effects.

4.9.3.2 Correlation between Personnel Factors and Time-related Effects

Table 4.42: Correlation between personnel factors and time-related effects

Correlations

		Personnel Factor	Time-related Effect
Personnel Factor	Pearson Correlation	1	.505**
	Sig. (2-tailed)		.002
	N	35	35
Time-related Effect	Pearson Correlation	.505**	1
	Sig. (2-tailed)	.002	
	N	35	35

**. Correlation is significant at the 0.01 level (2-tailed).

Table 4.42 shows the correlation between personnel factors and time-related effects. The Pearson correlation coefficient, r is 0.505. There is moderate positive relationship between personnel factors and time-related effects. There is significant relationship between the personnel factors and time-related effects at the 0.01 level.

4.9.3.3 Correlation between Personnel Factors and Disputes

Table 4.43: Correlation between personnel factors and disputes

Correlations

		Personnel Factor	Disputes
Personnel Factor	Pearson Correlation	1	.488**
	Sig. (2-tailed)		.003
	N	35	35
Disputes	Pearson Correlation	.488**	1
	Sig. (2-tailed)	.003	
	N	35	35

**. Correlation is significant at the 0.01 level (2-tailed).

Table 4.43 shows the correlation between personnel factors and disputes. The Pearson correlation coefficient, r is 0.488. There is moderate positive relationship between personnel factors and disputes. There is significant relationship between the personnel factors and disputes at the 0.01 level.

4.9.3.4 Correlation between Personnel Factors and Client-related Effects

Table 4.44: Correlation between personnel factors and client-related effects

Correlations

		Personnel Factor	Client-related Effect
Personnel Factor	Pearson Correlation	1	.402*
	Sig. (2-tailed)		.017
	N	35	35
Client-related Effect	Pearson Correlation	.402*	1
	Sig. (2-tailed)	.017	
	N	35	35

*. Correlation is significant at the 0.05 level (2-tailed).

Table 4.44 shows the correlation between personnel factors and client-related effects. The Pearson correlation coefficient, r is 0.402. There is moderate positive relationship between personnel factors and client-related effects. There is significant relationship between the personnel factors and client-related effects at the 0.05 level.

4.9.3.5 Correlation between Personnel Factors and Quality-related Effects

Table 4.45: Correlation between personnel factors and quality-related effects

Correlations

		Personnel Factor	Quality-related Effect
Personnel Factor	Pearson Correlation	1	.010
	Sig. (2-tailed)		.956
	N	35	35
Quality-related Effect	Pearson Correlation	.010	1
	Sig. (2-tailed)	.956	
	N	35	35

Table 4.45 shows the correlation between personnel factors and quality-related effects. The Pearson correlation coefficient, r is 0.010. There is negligible relationship between personnel factors and quality-related effects. There is no significant relationship between the personnel factors and quality-related effects.

4.9.3.6 Correlation between Personnel Factors and Performance-related Effects

Table 4.46: Correlation between personnel factors and performance-related effects

Correlations

		Personnel Factor	Performance-related Effect
Personnel Factor	Pearson Correlation	1	.181
	Sig. (2-tailed)		.298
	N	35	35
Performance-related Effect	Pearson Correlation	.181	1
	Sig. (2-tailed)	.298	
	N	35	35

Table 4.46 shows the correlation between personnel factors and performance-related effects. The Pearson correlation coefficient, r is 0.181. There is negligible relationship between personnel factors and performance-related effects. There is no significant relationship between the personnel factors and performance-related effects.

4.9.4 Relationship between Developers' Attitude towards the Preparation of Feasibility Study and All Groups of Effects of Abuses of Feasibility Study

The following section will discuss about the relationship between developers' attitude and cost-related effects; relationship between developers' attitude and time-related effects; relationship between developers' attitude and disputes; relationship between developers' attitude and client-related effects; relationship between developers' attitude and

quality -related effects; and relationship between developers' attitude and performance-related effects.

4.9.4.1 Correlation between Developers' Attitude and Cost-related Effects

Table 4.47: Correlation between developers' attitude and cost-related effects

Correlations

		Developer Attitude	Cost-related Effect
Developer Attitude	Pearson Correlation	1	.417*
	Sig. (2-tailed)		.013
	N	35	35
Cost-related Effect	Pearson Correlation	.417*	1
	Sig. (2-tailed)	.013	
	N	35	35

*. Correlation is significant at the 0.05 level (2-tailed).

Table 4.47 shows the correlation between developers' attitude and cost-related effects. The Pearson correlation coefficient, r is 0.417. There is moderate positive relationship between developers' attitude and cost-related effects. There is significant relationship between the developers' attitude and cost-related effects at the 0.05 level.

4.9.4.2 Correlation between Developers' Attitude and Time-related Effects

Table 4.48: Correlation between developers' attitude and time-related effects

Correlations

		Developer Attitude	Time-related Effect
Developer Attitude	Pearson Correlation	1	.615**
	Sig. (2-tailed)		.000
	N	35	35
Time-related Effect	Pearson Correlation	.615**	1
	Sig. (2-tailed)	.000	
	N	35	35

**. Correlation is significant at the 0.01 level (2-tailed).

Table 4.48 shows the correlation between developers' attitude and time-related effects. The Pearson correlation coefficient, r is 0.615. There is moderate positive relationship between developers' attitude and time-related effects. There is significant relationship between the developers' attitude and time-related effects at the 0.01 level.

4.9.4.3 Correlation between Developers' Attitude and Disputes

Table 4.49: Correlation between developers' attitude and disputes

Correlations

		Developer Attitude	Disputes
Developer Attitude	Pearson Correlation	1	.447**
	Sig. (2-tailed)		.007
	N	35	35
Disputes	Pearson Correlation	.447**	1
	Sig. (2-tailed)	.007	
	N	35	35

**. Correlation is significant at the 0.01 level (2-tailed).

Table 4.49 shows the correlation between developers' attitude and disputes. The Pearson correlation coefficient, r is 0.447. There is moderate positive relationship between developers' attitude and disputes. There is significant relationship between the developers' attitude and disputes at the 0.01 level.

4.9.4.4 Correlation between Developers' Attitude and Client-related Effects

Table 4.50: Correlation between developers' attitude and client-related effects

Correlations

		Developer Attitude	Client-related Effect
Developer Attitude	Pearson Correlation	1	.448**
	Sig. (2-tailed)		.007
	N	35	35
Client-related Effect	Pearson Correlation	.448**	1
	Sig. (2-tailed)	.007	
	N	35	35

**. Correlation is significant at the 0.01 level (2-tailed).

Table 4.50 shows the correlation between developers' attitude and client-related effects. The Pearson correlation coefficient, r is 0.448. There is moderate positive relationship between developers' attitude and client-related effects. There is significant relationship between the developers' attitude and client-related effects at the 0.01 level.

4.9.4.5 Correlation between Developers' Attitude and Quality-related Effects

Table 4.51: Correlation between developers' attitude and quality-related effects

Correlations

		Developer Attitude	Quality-related Effect
Developer Attitude	Pearson Correlation	1	.154
	Sig. (2-tailed)		.377
	N	35	35
Quality-related Effect	Pearson Correlation	.154	1
	Sig. (2-tailed)	.377	
	N	35	35

Table 4.51 shows the correlation between developers' attitude and quality-related effects. The Pearson correlation coefficient, r is 0.154. There is negligible relationship between developers' attitude and quality-related effects. There is no significant relationship between the developers' attitude and quality-related effects.

4.9.4.6 Correlation between Developers' Attitude and Performance-related Effects

Table 4.52: Correlation between developers' attitude and performance-related effects

Correlations

		Developer Attitude	Performance-related Effect
Developer Attitude	Pearson Correlation	1	.487**
	Sig. (2-tailed)		.003
	N	35	35
Performance-related Effect	Pearson Correlation	.487**	1
	Sig. (2-tailed)	.003	
	N	35	35

**. Correlation is significant at the 0.01 level (2-tailed).

Table 4.52 shows the correlation between developers' attitude and performance-related effects. The Pearson correlation coefficient, r is 0.487. There is moderate positive relationship between developers' attitude and performance-related effects. There is significant relationship between the developers' attitude and performance-related effects at the 0.01 level.

4.9.5 Fishbone Diagrams

In this research, fishbone diagram is used for the data interpretation. There are many reasons for explaining why using fishbone diagram as a tool for explanation. One of the reasons is that fishbone diagram (also known as Ishikawa Diagram) can be used to control the quality by focusing on the root causes that are largely contributing to the effects resulted from the problem (Rajkumar et al., 2013). In addition, the benefits of fishbone diagram include it helps us to emphasize on the areas that need special attention in which it brings many effects no matter is positive or negative and also as a reference for further study (Rajkumar et al., 2013). Other than that, fishbone diagram can also help in quality improvement (Singh et al., 2013). Moreover, the fishbone diagram can also be used to determine the risk of the event with many causes. The fishbone diagram can be used to identify the risk and then applied in the process of analyzing the probability and impact of the risk by calculating the risk score of each cause (Ilie and Ciocoiu, 2010).

The following sections show the fishbone diagram of causes and effects of abuses of feasibility study. Since there are six groups of effects of abuses of feasibility study, hence, there are six fishbone diagrams be drawn.

4.9.5.1 Cost-related Effects

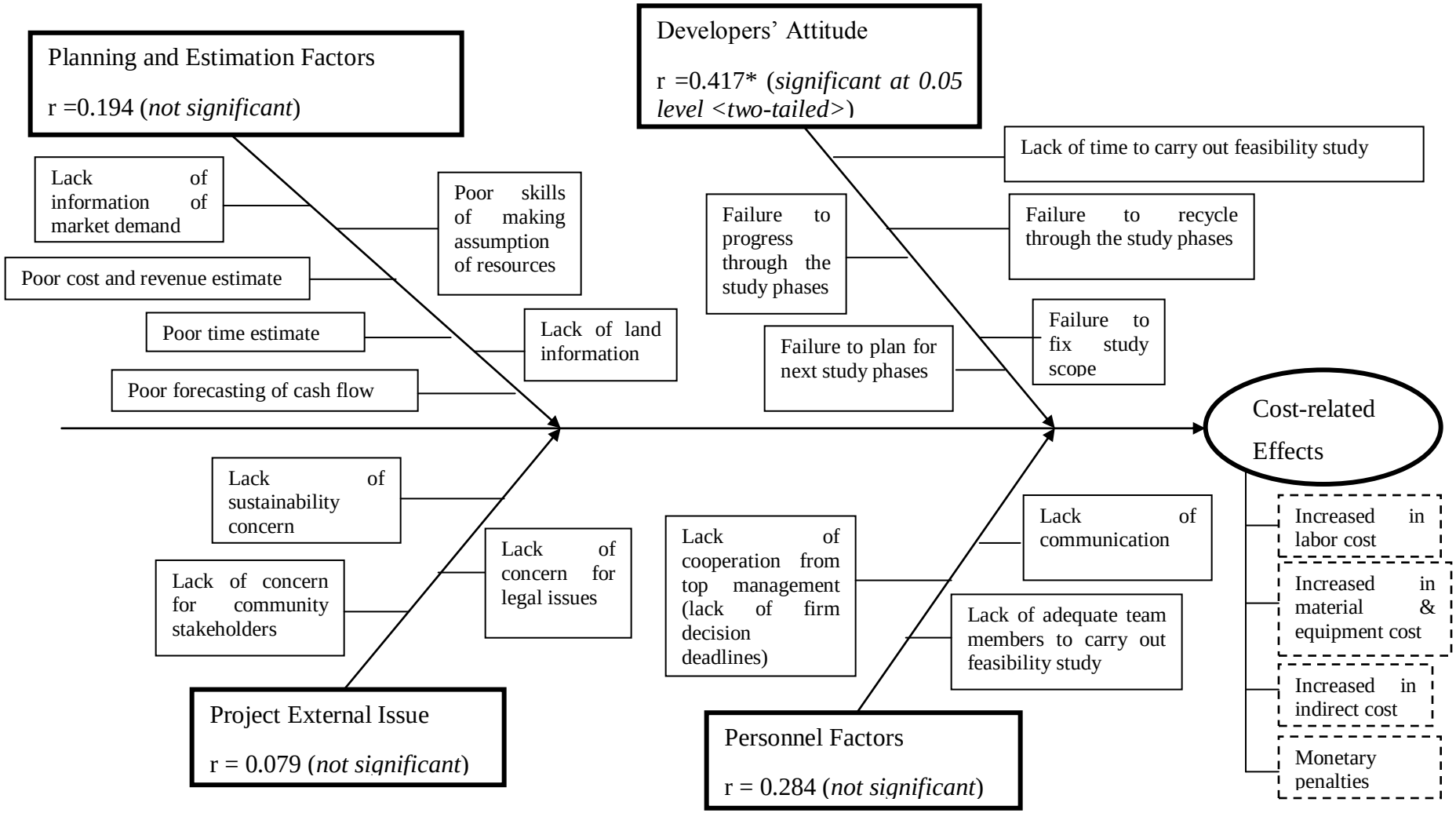

Figure 4.11: Fishbone diagram for cost-related effects

4.9.5.2 Time-related Effects

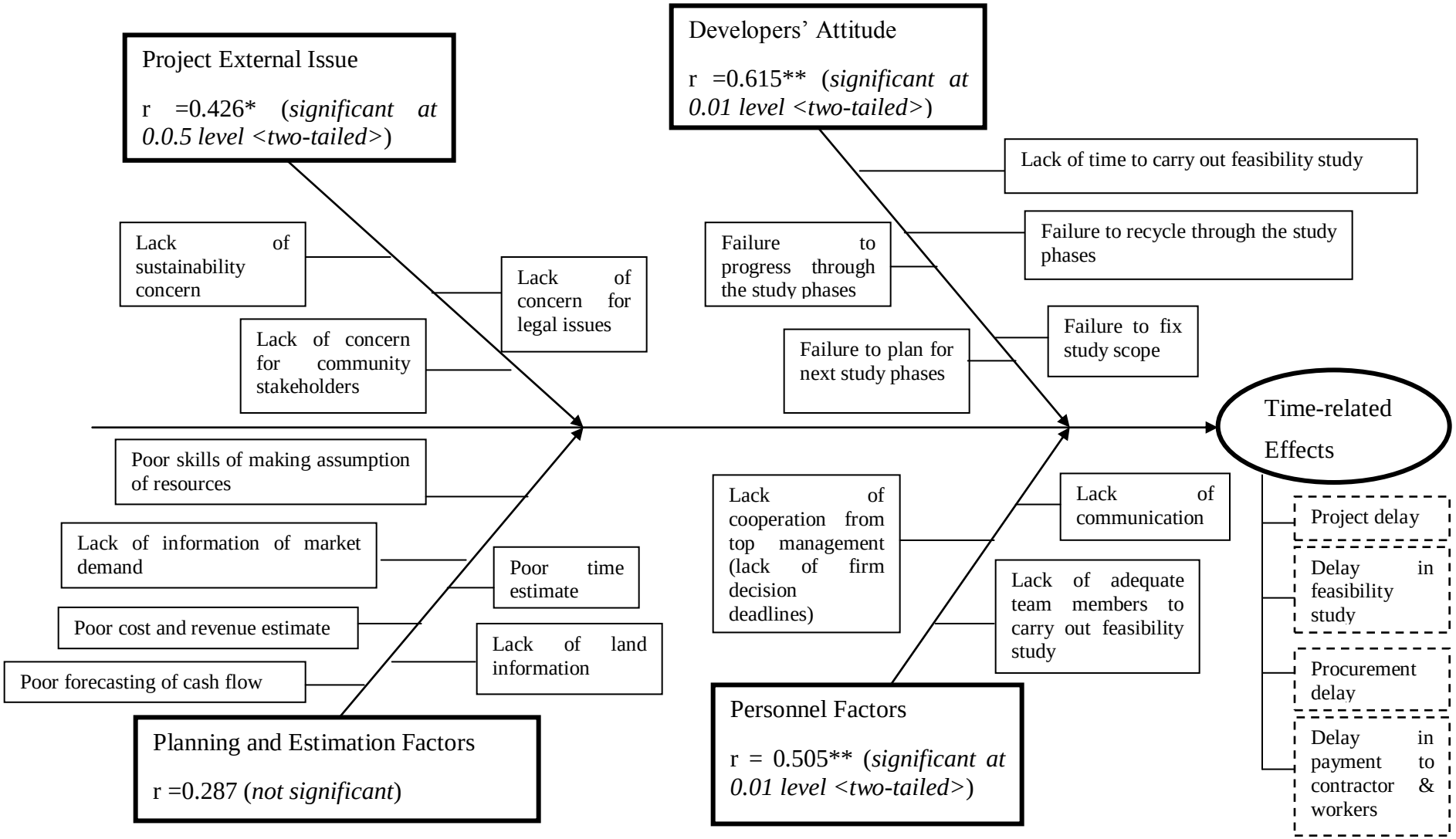

Figure 4.12: Fishbone diagram for time-related effects

4.9.5.3 Disputes

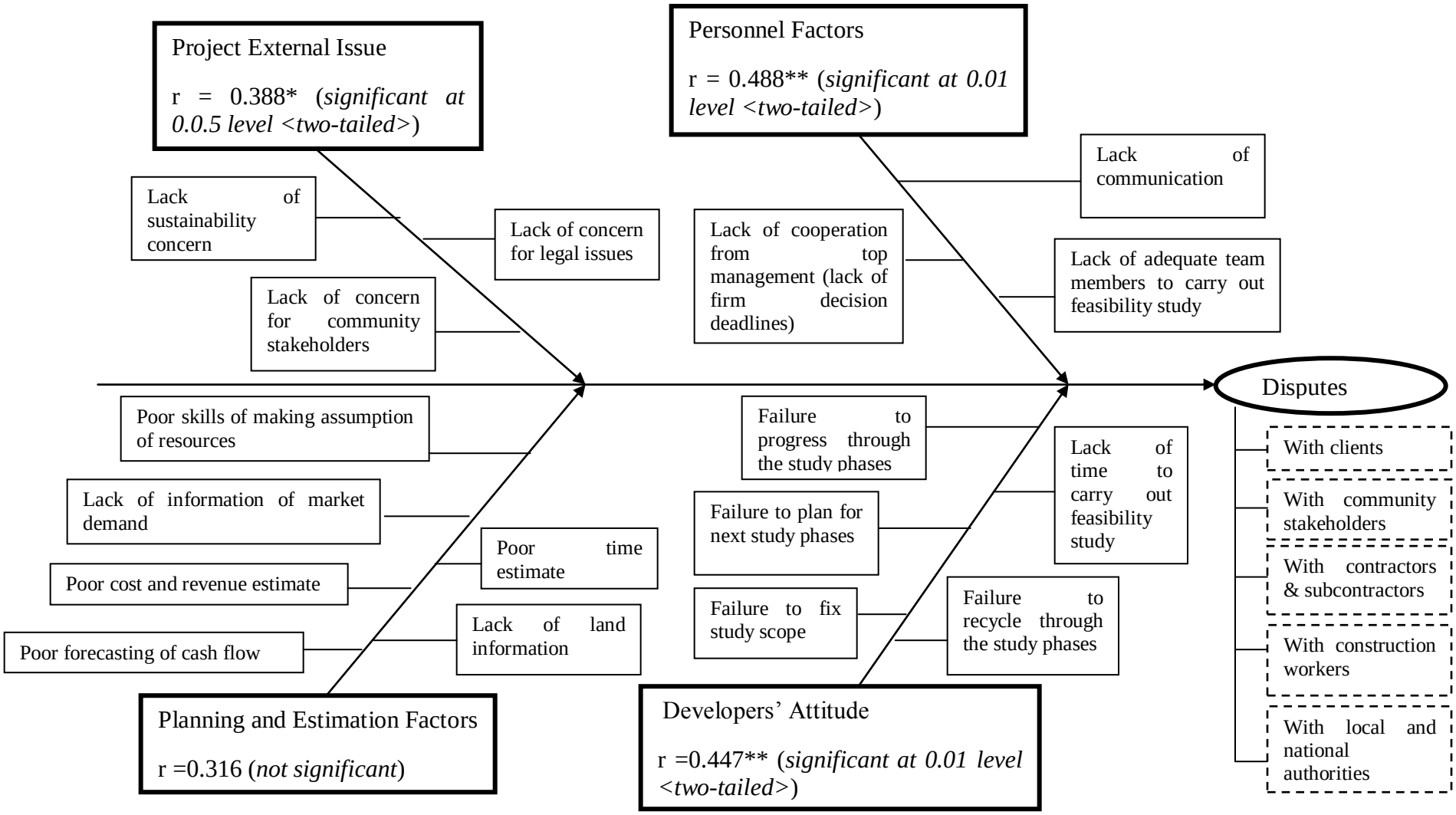

Figure 4.13: Fishbone diagram for disputes

4.9.5.4 Client-related Effects

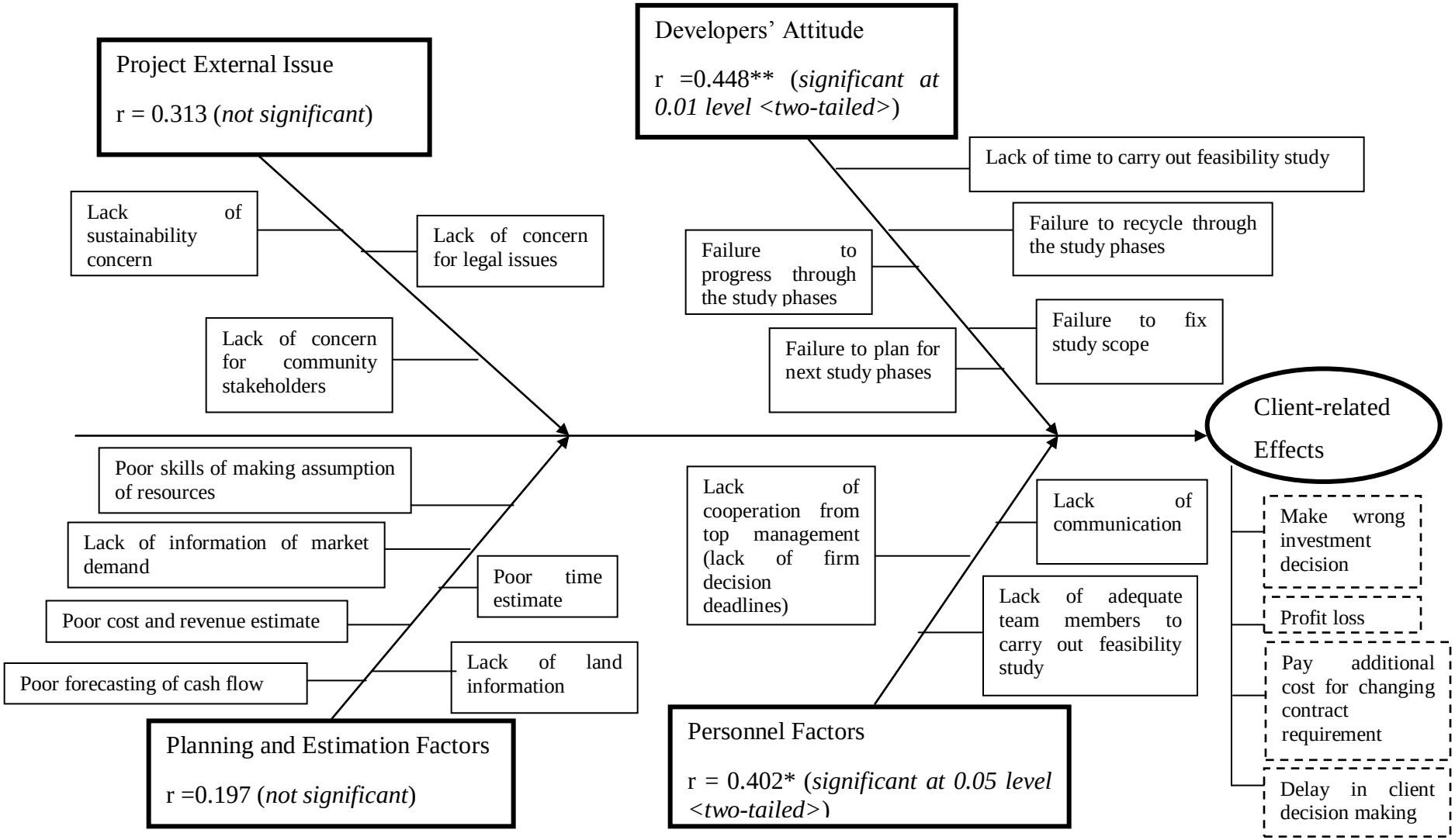

Figure 4.14: Fishbone diagram for client-related effects

4.9.5.5 Quality-related Effects

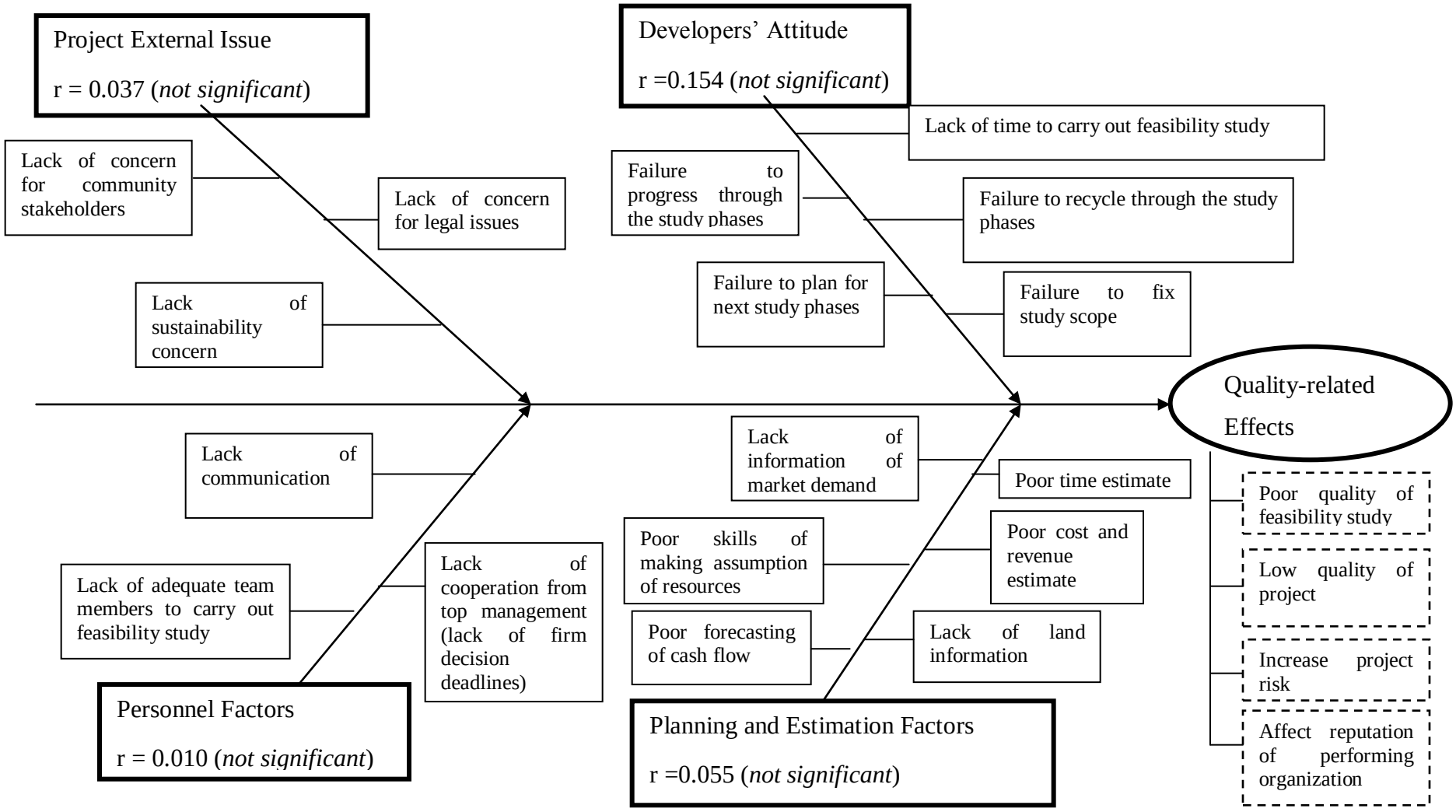

Figure 4.15: Fishbone diagram for quality-related effects

4.9.5.6 Performance-related Effects

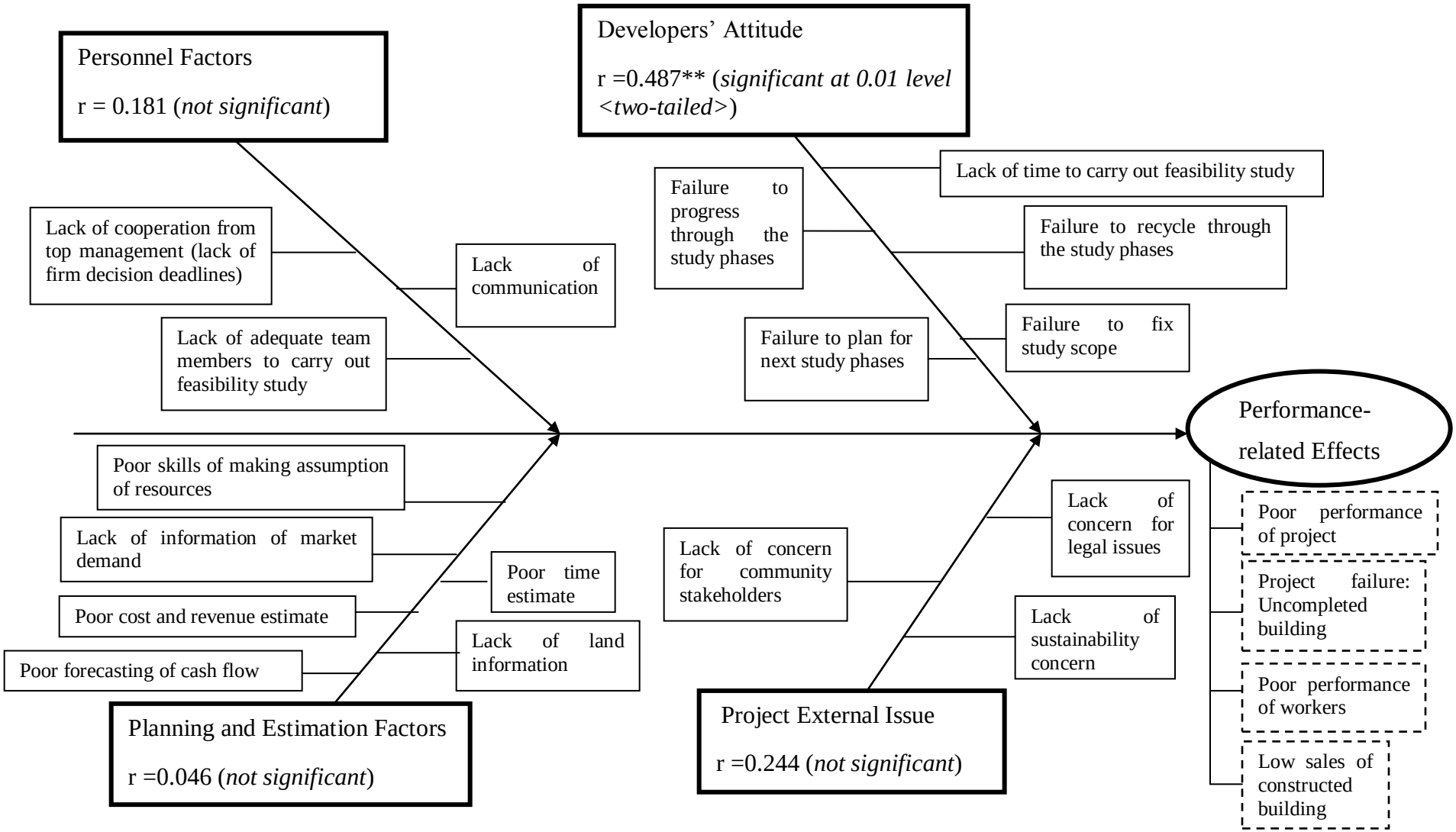

Figure 4.16: Fishbone diagram for performance-related effects

4.9.5.7 Descriptions of Fishbone Diagrams

Figure 4.11 shows the fishbone diagram for cost-related effects. There are four main causes contributing to cost-related effects. These four main causes are planning and estimation factors, project external issues, personnel factors, and developers' attitude. These four main causes are further divided into many sub-causes respectively. Cost-related effects are further divided into four sub-effects, which include increased in labor cost, increased in material and equipment cost, increased in indirect cost, and monetary penalties. As mentioned before, the fishbone diagram helps to focus on more significant causes; hence, more significant causes are placed nearer to effects. This illustration is more attractive and more convenience for readers to understand. From Figure 4.11, developers' attitude is most significant cause compared to other three main causes. There is significant relationship between developers' attitude and cost-related effects at the level of 0.05, with the Pearson correlation coefficient of 0.417. This explains that developers' attitude (such as lack of time to carry out feasibility study, failure to progress through study phases, failure to plan for next study phases, failure to recycle through the study phases, and failure to fix study scope) can significantly or directly causing cost-related effects which include increased in labor cost, increased in material and equipment cost, increased in indirect cost, and monetary penalties. Hence, the developers should put more attentions to the developers' attitude towards preparation of feasibility study in order to avoid suffering from cost-related effect. For the company which cares much about the cost-related effects, it can choose to ignore or put lesser attention on the causes which do not have significant relationship with cost-related effects (such as personnel factor, planning and estimation factors, and project external issues). Their Pearson correlation coefficients are 0.284, 0.194 and 0.079 respectively.

Figure 4.12 shows the fishbone diagram for time-related effects. There are also four causes that either directly or indirectly leading to the time-related effects, which are planning and estimation factors, project external issues, personnel factors, and developers' attitude. For time-related effects, there are four sub-groups which are surveyed in this research; these four sub-variables include project delay, delay in feasibility study,

procurement delay, and delay in payment for contractor and sub-contractor. From Figure 4.12, developers' attitude towards preparation of feasibility study and personnel factors are both significantly contributing to time-related effects at the level of 0.01, in which their Pearson correlation coefficients are 0.615 and 0.505 respectively. Other than that, the variable of project external issues is also significantly devoting to time-related effects in the issue of abuses of feasibility study at the level of 0.05, although it is less significant than two other factors (developers' attitude and personnel factors) as stated before. Therefore, the project team should put more attentions on these three factors in order to reduce or eliminating time-related effects. However, there are another one cause of abuses of feasibility study has indirect relationship with the variable of time-related effects, which is planning and estimation factors with the Pearson correlation coefficient of 0.287.

Figure 4.13 shows the fishbone diagram for disputes. From Figure 4.13, it can be seen that there are four main causes leading to disputes, which include planning and estimation factors, project external issues, personnel factors, and developers' attitude. There are five sub-groups of effects in the main effect of disputes, which are conflict with project client, conflict with community stakeholders, conflict with contractors and sub-contractors, conflict with construction workers, and conflict with local and national authorities. From Figure 4.13, there are two main factors largely bringing about disputes, which are personnel factors and developers' attitude toward preparation of feasibility study. These two factors have significant relationship with variable of disputes at the level of 0.01, with the Pearson correlation coefficient of 0.488 and 0.447 respectively. Besides that, the variable of project external issues also directly causing disputes at the level of 0.05 where its Pearson correlation coefficient is 0.388. The sub-groups of causes play important roles in causing disputes. Hence, the developers or project team should also focus on these sub-groups of causes under these three main causes (personnel factors, developers' attitude, and project external issues) due to minimize the probability of occurrence of disputes. However, there are another one cause of abuses of feasibility study has indirect relationship with the variable of disputes, which is planning and estimation factors with the Pearson correlation coefficient of 0.316.

Figure 4.14 shows the fishbone diagram for client-related effects. In this research, there are four main causes bringing about client-related effects, which include planning and estimation factors, project external issues, personnel factors, and developers' attitude. For the client-related effects, there are four sub-groups of effects, which are making wrong investment decision, profit loss, paying additional cost for changing contract requirement, and delay in client decision making. From Figure 4.14, developers' attitude is significantly causing client-related effects at the level of 0.01, in which its Pearson correlation coefficient is 0.448. On the other hands, personnel factors (such as lack of communication, lack of adequate team members to carry out feasibility study, and lack of cooperation from top management or lack of firm decision deadlines) is also significantly affecting the client in terms of making wrong investment decision, profit loss, paying additional cost for changing contract requirement, and delay in decision making at the level of 0.05. The Pearson correlation coefficient of personnel factor is 0.402. Apart from that, another two causes of abuses of feasibility study (project external issues, and planning and estimation factors) are not significantly affecting the project clients. Their Pearson correlation coefficients are 0.313 and 0.197 respectively. So, the project team which would like to attract more clients and wish to have close relationship with clients should emphasize on the variables of developers' attitude and personnel factors.

Figure 4.15 shows the fishbone diagram for quality-related effects. Same as the other effects of abuses of feasibility study, there are also four main causes contributing to it, which include planning and estimation factors, project external issues, personnel factors, and developers' attitude towards preparation of feasibility study. For quality-related effects, there are four sub-groups of effects under it, which are poor quality of feasibility study (producing poor result), low quality of project, increasing project risk, and affecting the reputation of performing organization. From Figure 4.15, there is no single one cause is significantly contributing to quality-related effects. However, there are correlation between four main groups of causes of abuses of feasibility study and quality-related effects. The Pearson correlation coefficient of developers' attitude is highest, which is 0.154. On the other hands, the Pearson correlation coefficient of personnel factors is lowest, which is 0.010. Whereas for the other two causes of abuse of feasibility study (planning and

estimation factors, and personnel factors), their Pearson correlation coefficient are 0.055 and 0.037 respectively.

Figure 4.16 shows the fishbone diagram for performance-related effects. In this research, there are four groups of main causes of abuses of feasibility study are devoting to performance-related effects. These four groups of main causes of abuses of feasibility study are planning and estimation factors, project external issues, personnel factors, and developers' attitude towards preparation of feasibility study. The main variable of performance-related effects are further divided into four sub-groups of effects, which are poor performance of project, project failure or uncompleted building, poor performance of workers, and low sales of constructed building. From Figure 4.16, there is only one cause of abuses of feasibility study significantly leading to performance-related effects at the level of 0.01, which is developers' attitude towards preparation of feasibility study. The Pearson correlation coefficient of developers' attitude is 0.487. The developers' attitude towards preparation of feasibility study (such as lack of time to carry out feasibility study, failure to progress through study phases, failure to plan for next study phases, failure to recycle through the study phases, and failure to fix study scope) will significantly resulting in poor performance in terms of poor performance of project, project failure, poor performance of workers, and low sales of constructed building. Hence, the organization or the project team should focus more on the variable of developers' attitude towards preparation of feasibility study. However, the other three causes of abuses of feasibility study (project external issues, personnel factors, and planning and estimation factors) are not significantly leading to the performance-related effects. Their Pearson correlation coefficients are 0.244, 0.181, and 0.046 respectively.

4.10 DISCUSSIONS AND SUMMARY OF FINDINGS

There are four objectives in this research:

5. To identify the causes of abuses of feasibility study in construction industry.
6. To determine the effects of abuses of feasibility study in construction industry.

7. To highlight the types of abuses occurred in feasibility study in construction industry.
8. To examine the relationship between the causes and effects of abuses of feasibility study in construction industry.

4.10.1 Discussions and Summary of Findings of First Research Objective (RO1)

Table 4.53: Summary of mean and ranking of causes of abuses of feasibility study

Causes of Abuses of Feasibility Study	Sub-Variables		Main Variables	
	Mean	**Rank**	**Mean**	**Rank**
Personnel Factors			**3.9333**	**1**
i. Lack of communication	4.0000	2		
ii. Lack of adequate team member to carry out feasibility study	4.1714	1		
iii. Lack of cooperation from top management (lack of firm decision deadlines)	3.6286	5		
			3.6286	**2**
Planning and Estimation Factors	3.7714	4		
i. Poor skills of making assumption of resources	3.8000	3		
ii. Lack of information of market demand	3.5714	6		
iii. Poor cost and revenue estimate	3.8000	3		
iv. Poor time estimate	3.2571	13		
v. Poor forecasting of cash flow	3.5714	6		
vi. Lack of land information				

			3.4571	**3**
Project External Issues	3.5429	7		
i. Lack of sustainability concerns	3.5143	8		
ii. Lack of concern for legal issues	3.3143	12		
iii. Lack of concern for community stakeholders				
			3.4229	**4**
Developers' Attitude	3.4857	9		
i. Lack of time to carry out feasibility study	3.4857	9		
ii. Failure to progress through study phases	3.4571	10		
iii. Failure to plan for next study phases	3.3714	11		
iv. Failure to recycle through the study phases	3.3143	12		
v. *Failure to fix study scope*				

Table 4.53 shows the summary of mean and ranking of causes of abuses of feasibility study. According to data collection from 35 respondents, the main variable of personnel factors has the highest overall mean score of 3.9333, whereas the main variable of developers' attitude has the lowest overall mean score of 3.4229. Most of the respondents think that the sub-variables of lack of team members to carry out the feasibility study and lack of communication within the project team are largely contributing to the occurrence of abuses of feasibility study, in which their means are 4.1714 and 4.0000 respectively. Nowadays, the intellectual properties are essential assets that contribute to the project success (Fugar and Agyakwah-Baah, 2010). Besides that, the communication is important determinants of project success, in which all information and ideas need to be communicated, so that, the project objective can be achieved (PMBOK Guide 4th edition, 2008). On the other hands, the sub-variables of failure to recycle through the study phase and failure to fix study scope have the lower mean scores, which are

3.3714 and 3.3143 respectively. These two sub-variables are lesser contributing to the abuses of feasibility study when compared with other sub-variables.

4.10.2 Discussions and Summary of Findings of Second Research Objective (RO2)

Table 4.54: Summary of means and ranking of effects of abuses of feasibility study

Effects of Abuses of Feasibility Study	Sub-Variables		Main Variables	
	Mean	**Rank**	**Mean**	**Rank**
Client-related Effects			**3.9571**	**1**
i. Make wrong investment decision	4.2000	2		
ii. Profit loss	4.2286	1		
iii. Pay additional cost for changing contract requirement	3.5429	15		
iv. Delay in client decision making	3.8571	7		
Cost-related Effects			**3.8571**	**2**
i. Increased in labor cost	4.1714	3		
ii. Increased in material and equipment cost	4.0286	4		
iii. Increased in indirect cost	3.7429	11		
iv. Monetary penalties	3.4857	17		
Time-related Effects			**3.8000**	**3**
i. Project delay	4.2000	2		
ii. Delay in feasibility study	3.8286	8		
iii. Procurement delay	3.6571	13		
iv. Delay in payment to contractor and workers	3.5143	16		

Quality-related Effects			**3.7000**	**4**
i. Poor quality of feasibility study: Produce poor result	3.8857	6		
ii. Low quality of project	3.7714	10		
iii. Increase project risk	3.5429	15		
iv. Affect reputation of performing organization	3.6000	14		
Performance-related effects			**3.6429**	**5**
i. Poor performance of project	3.8000	9		
ii. Project failure: Uncompleted building	3.4571	18		
iii. Poor performance of workers	3.3429	20		
iv. Low sales of constructed building	3.9714	5		
Disputes			**3.3143**	**6**
i. Conflict with project clients	3.7143	12		
ii. Conflict with community stakeholders	3.3714	19		
iii. Conflict with contractors and subcontractors	3.4571	18		
iv. Conflict with construction workers	3.1714	21		
v. Conflict with local and national authorities	2.8571	7		

Table 4.54 shows the summary of means and ranking of effects of abuses of feasibility study. According to data collection from 35 respondents, the main variable of client-related effects has the highest overall mean score of 3.9571, whereas the main variable of disputes has the lowest overall mean score of 3.3143. Most of the respondents think that the sub-variables of client profit loss and client make wrong investment decision are largely resulting from the occurrence of abuses of feasibility study, in which their

means are 4.2286 and 4.2000 respectively. On the other hands, the sub-variables of conflict with contractors and sub-contractors, conflict with community stakeholders, and conflict with construction workers have the lower mean scores, which are 3.4571, 3.3714, and 3.1714 respectively. These three sub-variables have the lower probability to be resulted from the occurrence of the abuses of feasibility study when compared with other sub-variables.

4.10.3 Discussions and Summary of Findings of Third Research Objective (RO3)

Table 4.55: Summary of means and ranking of types of abuses occurred in feasibility study

Types of Abuses Occurred in Feasibility Study	Sub-Variables		Main Variables	
	Mean	**Rank**	**Mean**	**Rank**
Failure to Undertake Feasibility Study that is fit for Purpose			**3.6143**	**1**
i. Misunderstanding of the objective of feasibility study	3.4857	4		
ii. Failure to achieve minimum standard of feasibility study	3.3714	5		
iii. Inaccurately measure the potential of project	3.8286	1		
iv. Negligence in identifying the features of project.	3.7714	2		
Misunderstanding of Study Phases			**3.2857**	**2**
i. Misunderstanding of conceptual/scoping study (phase 1)	3.3714	5		
ii. Misunderstanding of	3.2571	7		

	prefeasibility study (phase 2)			
iii.	*Misunderstanding of full feasibility study (phase 3)*	3.2286	8	
Misleading Use of Feasibility Study			**3.2358**	**3**
i.	*Do not carry out feasibility study properly*	3.7143	3	
ii.	*Deliberately fraudulent occurred in feasibility study*	2.9429	9	
iii.	*Do not follow governmental rules and regulations*	3.3429	6	
iv.	*Ignoring some aspects of contractual requirement*	2.9429	9	

Table 4.55 show the means and ranking of three main types of abuses occurred in feasibility study. This ranking is based on the data collection from 35 respondents who involved in this research. Out of 35 respondents, the highest ranking of type of abuses occurred in feasibility study is failure to undertake feasibility study that is fit for purpose, with its overall mean of 3.6143. The sub-group of inaccurately measure the potential of project has highest means score of 3.8286, and the sub-group of negligence in identifying the features of project has the second highest mean score of 3.7714. On the other hands, the second highest ranking of types of abuses occurred in feasibility study is misunderstanding of study phases, in which it has overall mean of 3.2857. Last but not least, the lowest ranking of types of abuses occurred in feasibility study is misleading use of feasibility study, in which its overall mean is 3.2358. The sub-groups of deliberately fraudulent occurred in feasibility study and ignoring some aspects of contractual requirement have the lowest mean score compared to other sub-groups of types of abuses occurred in feasibility study, in which their mean scores are 2.9429.

4.10.4 Discussions and Summary of Findings of Fourth Research Objective (RO4)

Table 4.56: Overview of correlation between causes and effects of abuses of feasibility study in construction industry

Causes / Effects	Planning and estimation factors	Project external issues	Personnel factors	Developers' attitude
Cost-related effects	0.194	0.079	0.284	0.417*
Time-related effects	0.287	0.426*	0.505**	0.615**
Disputes	0.316	0.388*	0.488**	0.447**
Client-related effects	0.197	0.313	0.402*	0.448**
Quality-related effects	0.055	0.037	0.010	0.154
Performance-related effects	0.046	0.244	0.181	0.487**

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Table 4.56 shows the overview of correlation between causes and effects of abuses of feasibility study in construction industry. In this research, the causes of the abuses of feasibility study are categorized into four groups, which include planning and estimation factors, project external issues, personnel factors, and developers' attitude. These four groups of causes of abuses of feasibility study are further divided into their own sub-

groups respectively. On the other hands, the effects of abuses of feasibility study are categorized into six groups, which include cost-related effects, time-related effects, disputes, client-related effects, quality-related effects, and performance-related effects. Same as causes of abuses of feasibility study, the effects of abuses of feasibility study are also further divided into their own sub-groups respectively.

There are significant relationships between several groups of causes and effects of abuses of feasibility study at the level of 0.01. These include correlation between personnel factors and time-related effects, correlation between personnel factors and disputes, correlation between developers' attitude and time-related effects, correlation between developers' attitude and disputes, correlation between developers' attitude and client-related effects, and correlation between developers' attitude and performance-related effects. On the other hands, there are significant relationships between several groups of causes and effects of abuses of feasibility study at the level of 0.05. These include correlation between project external issues and time-related effects, correlation between project external issues and disputes, correlation between personnel factors and client-related effects, and correlation between developers' attitude and cost-related effects.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

This chapter is mainly to conclude the research based on the research objectives that have been set. Other than that, the limitation of the research and recommendation for future research are also going to be discussed in this chapter.

5.2 LIMITATIONS OF RESEARCH

There are some limitations in this research, which make this research cannot be perfectly completed. There is limitation of time for carrying out of this research. Limited time period lowers the probability of receiving the questionnaires from all respondents. Postal questionnaires require appropriate amount of time for questionnaire to post to the respondents and post back to the researchers. There are uncertainties occurred during the process of posting the questionnaires. One of the uncertainties is that there are many public

holidays within the period of collection of questionnaires, this prolongs the period of receiving questionnaire by both the respondents and researcher. In addition, the address of some developer companies had been changed and do not updated on internet. All of these uncertainties are subsequently lowering the response rate of the research. Moreover, there is also limitation of budget for conducting this research. Postal questionnaires require some amount of budget, which include the budget for stamp and envelope. There is lack of financial support for collecting more data from other states of country.

Furthermore, there is low response rate for this research which is commonly faced by other researchers as well. In this research, the researcher faced the problem of collecting back the questionnaires. There are many reasons for this incident. One of the reasons is that most of the respondents felt that the topic of the research is quite sensitive, so they refused to fill the questionnaire. Other than that, the questionnaires also distributed through sending e-mail. However, the response rate for receiving email from the respondents is much lower. This is because some of the e-mail addresses are invalid.

In addition, there is limited availability of resources for research information. The topic of causes and effects of abuses of feasibility study in construction industry is less discussed by the researchers in Malaysia as well as other countries all around the world. Hence, there is limited accessibility of journals, books and articles for the collection of information for this research. This limitation make the research cannot be perfectly comprehensive.

Besides that, this research is typically focusing on developers registered under REDHA (Real Estate and Housing Developers' Association) as members in Johor, Malaysia. However, Johor cannot significantly represent the perception of developers in whole Malaysia towards the topic of causes and effects of abuses of feasibility study in construction industry.

Other than that, another limitation of this research is that this study does not apply notability regression as part of analysis. This is because this study does not seek any prediction of independent variable to any dependent variable.

5.3 CONCLUSIONS

Feasibility study is essential tool in deciding of carrying out a project on construction industry. There is occurrence of the issue of abuses of feasibility study in construction industry although there are fewer attentions by the developers towards this issue before. There are many different types of abuses of feasibility study in construction industry. Other than that, there are wide range of causes of abuses of feasibility study in construction industry and a variety of effects resulting from the occurrence of abuses of feasibility study in construction industry. It is important to explore the issue of abuses of feasibility study since this issue will bring a lot of negative impacts towards the developers as well as other person involved in construction industry.

There are four objectives in this research. First objective is to identify the causes of abuses of feasibility study in construction industry. Second objective is to determine the effects of abuses of feasibility study in construction industry. Third objective is to highlight the types of abuses occurred in feasibility study in construction industry. Last but not least, the fourth objective is to examine the relationship between the causes and effects of abuses of feasibility study in construction industry. All of four research objectives (RO) are successfully achieved.

RO1: Identify the Causes of Abuses of Feasibility Study in Construction Industry

In this research, there are four groups of causes of abuses of feasibility study in construction industry which had been surveyed. For achieving first objective, mean frequencies are used to calculate and rank the causes of abuses of feasibility study in construction industry. According to responses given by 35 respondents, all groups of causes are contributing to the occurrence of abuses of feasibility study, but with different mean frequencies. Based on the data analysis in Chapter 4, most of the respondents agreed that personnel factors are largely leading to the abuses of feasibility study, in which it is ranked as first main cause of abuses of feasibility study in construction industry. The personnel factors include lack of communication, lack of adequate team members to carry out feasibility study, and lack of cooperation from top management or lack of firm decision making. Lacking of adequate team members to carry out feasibility study is ranked at first place of sub-causes, in which it is most significant causes of abuses of feasibility study in construction industry. The members in project team play important roles in the preparation of feasibility study. There are many professionals need to be involved in the preparation of feasibility study. The persons who are usually involved in feasibility study include civil engineer, architect, town planner, valuation surveyor, quantity surveyor, M & E engineer and other professionals. The feasibility study can only be successful completed unless it is equipped with the knowledge and skills of these professionals. Besides that, lack of communication is also one of the more significant causes of abuses of feasibility study. Communication is essential in ensuring project success. Lack of communication will lead to conflict and disputes occurred no matter within or outside project team. Hence, it is necessary for a project team to have good communication skills in order to achieve desired project goals and objectives.

On the other hands, planning and estimation factors are ranked at second main cause of abuses of feasibility study. Planning and estimation factors include poor skills of making assumptions of resources, lack of information of market demand, poor cost and

revenue estimate, poor time estimate, poor forecasting of cash flow, and lack of land information. Most of the respondents agreed that lack of information of market demand and poor skills of making assumptions of resources are the causes which are also largely contribute to the abuses of feasibility study in construction industry, in which they are ranked as third and fourth sub-causes of abuses of feasibility study. Abuses of feasibility study will occur because the team members are lacking of professional skills and knowledge in handling and managing project. In order to avoid this problem, the organization should provide some training course for team members for improving their skills.

Apart from that, the project external issues are ranked at third main cause of abuses of feasibility study in construction industry. Project external issues include lack of sustainability concern, lack of concern for legal issues, and lack of cooperation from top management or lack of firm decision deadlines. The project team should also pay more attentions towards project external issues in which these external issues can also affect the project success. For example, community stakeholders are one of influencing group of stakeholders towards project success. They can affect the progress of the project by having protest if their needs are not satisfied by the project team. Last but not least, the developers' attitude towards the preparation of feasibility study is ranked at fourth main cause of abuses of feasibility study in construction industry. Developers' attitude towards the preparation of feasibility study include lack of time to carry out feasibility study, failure to progress through study phases, failure to plan for next study phases, failure to recycle through the study phases, and failure to fix study scope. All of these sub-causes are lesser contributing to the abuses of feasibility study compared to other causes. However, the developers should do self-reflection on their own attitudes and always review their own works in order to make sure no mistakes had been made.

RO2: Determine the Effects of Abuses of Feasibility Study in Construction Industry

In this research, there are six groups of effects of abuses of feasibility study in construction industry that has been surveyed. Same as cases of abuses of feasibility study in construction industry, the effects of abuses of feasibility study in construction industry is also calculated and ranked by using mean frequencies. Based on the data collection, all of groups of effects are resulting from the issue of abuses of feasibility study where each effect has their own mean frequencies. Most of the respondents agreed that the first place of main effects of abuses of feasibility study in construction industry is client-related effects. Client-related effects include making wrong investment decision, profit loss, paying additional cost for changing contract requirement, and delay in client decision making. Clients are one of the most important stakeholders in a construction project. Every construction project requires clients to invest, hence, if the issue of abuses of feasibility study occurs, the main victim will be clients who will suffered from profit loss. This is why the sub-effect of profit loss by clients is ranked at first place out of 25 sub-effects of abuses of feasibility study. On the other hands, the second place of sub-effects of abuses of feasibility study is clients make wrong investment decision. This is directly related with the sub-effects of profit loss. Once the clients make wrong investment decision, the clients will be suffered from profit loss.

Besides that, cost-related effects are ranked as second main effects of abuses of feasibility study. Cost-related effects include increased in labor cost, increased in material and equipment cost, increased in indirect cost, and monetary penalties. The sub-effects of increased in labor cost and increased in material and equipment cost are ranked at third and fourth place respectively out of 25 sub-effects. The abuses of feasibility study will resulted in increased in project cost (i.e. labor, material and equipment cost), this is because of developers' attitude towards the preparation of feasibility study, such as lack of time to carry out feasibility study, failure to progress through study phases, failure to plan for next study phases, failure to recycle through the study phases, and failure to fix study scope.

Apart from that, time-related effects are ranked as third main effects of abuses of feasibility study. Time-related effects include project delay, delay in feasibility study, procurement delay, and delay in payment to contractors and workers. Project delay is ranked at second place of sub-effects of abuses of feasibility study, which is same ranking as making wrong investment decision. Developers' attitude towards the preparation of feasibility study, personnel factors, and project external issues are leading to project delay.

In addition, the quality-related effects are ranked as fourth main effect of abuses of feasibility study. Quality-related effects include poor quality of feasibility study (producing poor result), low quality of project, increasing project risk, and affecting the reputation of performing organization. The abuses of feasibility study will indirectly lowering the quality of feasibility study as well as the quality of the project. This is because feasibility study is conducted during the early phases of project life cycle, which is then be used as decision making tool in the later phase. In contrast, the performance-related effects are ranked as fifth main effect of abuses of feasibility study. Performance-related effects include poor performance of project, project failure (uncompleted building), poor performance of workers, and low sales of constructed building. Low sales of constructed building are ranked at fifth place of sub-effects out of 25 sub-effects. This is because the abuses of feasibility study will lead to decreased in the confidence of clients towards that particular construction project, this subsequently decreasing the sales of constructed building.

Last but not least, disputes are ranked at last place of main effects of abuses of feasibility study in construction industry. In other words, disputes is least influenced by the abuses of feasibility study in construction industry. Disputes are further divided into five categories, which include conflict with project clients, conflict with community stakeholders, conflict with contractors and sub-contractors, conflict with construction workers, and conflict with local and national authorities. Conflict with construction workers is ranked at last place out of 25 sub-effects. In other words, construction workers

are least influenced by the issue of abuses of feasibility study. They are still receiving the payment from their employer although the abuses of feasibility study occur.

RO3: Highlight the Types of Abuses Occurred in Feasibility Study in Construction Industry

There are three types of abuses occurred in feasibility study in construction industry which had been surveyed. These include misleading use of feasibility study, misunderstanding of study phases, and failure to undertake feasibility study that is fit for purpose. The data are analyzed in mean frequencies and percentage. Based on data collection from 35 respondents, failure to undertake feasibility study that is fit for purpose is ranked as most commonly types of abuses occurred in feasibility study. Failure to undertake feasibility study that is fit for purpose is further divided in to four sub-groups, which include misunderstanding of objective of feasibility study, failure to achieve minimum standard of feasibility study, inaccurately measure the potential of project, and negligence in identifying the features of project. Among 11 sub-types of abuses occurred in feasibility study, inaccurately measure the potential of project and negligence in identifying the features of project are ranked at first and second place respectively. This means that the most common mistakes made in the preparation of feasibility study are identifying the characteristics of the project which include the potential of project and features of project. Hence, the project team should be careful and pay full attention in the process of identifying the characteristics of the project.

Other than that, misunderstanding of study phases is ranked as second most commonly types of abuses occurred in feasibility study. Feasibility study is divided into three phases, which are conceptual or scoping study, prefeasibility study, and full feasibility study. Most of respondents think that the first phase (conceptual/scoping study) are more important compared to another two later phases. This is because if the project

team misunderstands the first phase of feasibility study, then the later phases of feasibility study will be suffered and have to bear many negative effects.

Last but not least, misleading use of feasibility study is least common types of abuses occurred in feasibility study. However, the sub-group of do not carry out feasibility study properly is ranked at third place out of 11 sub-types of abuses occurred in feasibility study. This is because most of the respondents think that do not carry out the feasibility study properly is directly reflecting the issue of abuses of feasibility study in construction industry. The abuses of feasibility study will occur is mainly because the developers or project team do not prepare and conduct feasibility study in proper and right way.

RO4: Examine the Relationship between the Causes and Effects of Abuses of Feasibility Study in Construction Industry

For achieving the fourth objective, Pearson correlation is used to measure the correlation between the causes and effects of abuses of feasibility study in construction industry. From the data analyzed, there are positive relationships between the causes and effects of abuses of feasibility study in construction industry. In addition, there are significant relationship between several groups of causes and effects of abuses of feasibility study in construction industry at the level of 0.01 as well as at the level of 0.05. The presence of significant relationship between the causes and effects of abuses of feasibility study reflects that the causes of abuses of feasibility study are directly leading to the effects of abuses of feasibility study. For easy understanding by the readers, the fishbone diagram is used to illustrate the correlation between four groups of causes of abuses of feasibility study and six groups of effects of abuses of feasibility study. By using the fishbone diagram, the company can focus on the more essential causes of abuses of feasibility study by minimizing or eliminating them in order to reduce or avoid the effects resulting from the causes of abuses of feasibility study.

There are several significant relationships between different groups of causes and different groups of effects of abuses of feasibility study. There are two levels of significance for the correlation between the causes and effects of abuses of feasibility study in construction industry, which are 0.01 and 0.05 levels. At the level of significance of 0.01, there are significant relationships between personnel factors and time-related effects, between personnel factors and disputes, between developers' attitude and time-related effects, between developers' attitude and disputes, between developers' attitude and client-related effects, and between developers' attitude and performance-related effects. On the other hands, at the level of significance of 0.05, there are significant relationships between project external issues and time-related effects, between project external issues and disputes, between personnel factors and client-related effects, and between developers' attitude and cost-related effects. The companies should focus on these causes and effects of abuses of feasibility study in construction industry which have significant relationships. So that, the issue of abuses of feasibility study in construction industry can be reduced to a minimum level or even none.

As conclusion, feasibility studies are conducted mainly to determine and decide whether a project is profitable and realistically be achieved (Abou-Zeid et al., 2007; Hyari, K. and Kandil, A., 2009). According to Mackenzie, W. and Cusworth, N. (2007), there are abuses of feasibility studies occurred in some companies. Therefore, the organization should aware of the issue of abuses of feasibility study in construction industry. There are three types of abuses occurred in feasibility study in construction industry that had been surveyed, which are misleading use of feasibility study, misunderstanding of study phases, and failure to undertake feasibility study that is fit for purpose. After identifying types of abuses occurred in feasibility study, the project team should find out the causes and effects of abuses of feasibility study in construction industry. In this research, there are four main causes of abuses of feasibility study in construction industry, which include planning and estimation factors, project external issues, personnel factors, and developers' attitude towards preparation of feasibility study. On the other hands, there are six groups of effects of abuses of feasibility study in construction industry that had been surveyed, which

include cost-related effects, time-related effects, disputes, client-related effects, quality-related effects, and performance-related effects. After determining the causes and effects of abuses of feasibility study in construction industry, the project team should suggest some solutions to eliminate the causes of abuses of feasibility study since there are significant and positive relationship between causes and effects of abuses of feasibility study in construction industry.

5.4 RECOMMENDATIONS FOR FUTURE RESEARCH

There are some recommendations for future research. This research proved that there is occurrence of abuses of feasibility study in construction industry. The feasibility study is also used in other industries such as manufacturing and other types of business. Hence, it is recommended to carry out a research on the topic of causes and effects of abuses of feasibility study in different industries. This can be used for comparison among different industries, and the results obtained can help entrepreneurs to avoid from the issue of abuses of feasibility study in which this issue will subsequently reduce the profits gained by entrepreneurs.

Apart from that, the scope of further study can be expanded to other states of country or even whole Malaysia by giving longer time and financial support. By expanding the scope of the research to whole Malaysia, this can increase the reliability of perception of developers in whole country, as compared to this research which is only focusing on Johor. In addition, by having the research of surveying the construction industry in whole Malaysia, this will help to improve the quality of construction industry in Malaysia and Malaysia can also be a more developing country. This subsequently improves the quality of society life as well as improves the economical situation of the country.

The researcher recommends that it should be given longer time period and financial support in order to get higher response rate for the research. The researcher of future research can try other research methodologies other than postal questionnaires. Since there is limited time and budget, the response rate of this research is lower than expected sample size (in which it should collect back 85 respondents).

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APPENDIX A

GANTT CHART FOR FYP 1

No	Task	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
1	Meet with potential supervisor, and propose the potential research title and research objectives										
2	Confirmation of supervisor and approved of research title and objectives										
3	Data collection for problem statement										
4	Preparation for Chapter 1 (Introduction)										
5	Preparation for Chapter 2 (Literature Review)										
6	Preparation for Chapter 3 (Methodology)										
7	Develop research questionnaire										
8	Modification, finalization and submission of FYP 1										

APPENDIX B

GANTT CHART FOR FYP 2

No	Task	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
1	Finalization of Questionnaire												
2	Distribution of Questionnaire												
3	Collection of Questionnaire												
4	Analysis of Data												
5	Writing of Report												
6	Modification, Finalization and Submission of FYP 2												

APPENDIX C

QUESTIONNAIRE

FACULTY OF TECHNOLOGY

UNIVERSITI MALAYSIA PAHANG

Research Title: Causes and Effects of Abuses in Feasibility Study: A Study in Malaysian Construction Industry

Section A: Information of Developer

NAME OF RESPONDENT (optional) : _____

CURRENT POSITION : _____

QUALIFICATION : _____

(e.g.: Bachelors Degree / Masters Degree / PHD / Others)

EXPERIENCE OF RESPONDENT IN CONSTRUCTION : _____Year

NAME OF COMPANY : _____

ADDRESS OF COMPANY : _____

TEL. & FAX : _____

Section B: Types of Abuses Occurred in Feasibility Study

1. Main type of projects involved (Please tick, one option applicable)

   Residential Project ☐ Commercial Project ☐

   Industrial Construction Project ☐
   (e.g.: petroleum refineries, petroleum plants, power plants, steel mills, and heavy manufacturing plants such as car manufacturing)

   Others: _____

2. Who are most frequently involved in the preparation of feasibility study? (Please tick, ALL option applicable)

   Architect ☐ Quantity Surveyor ☐

   Civil Engineer ☐ M & E Engineer ☐

   Valuation Surveyor ☐ Town Planner ☐

   Others: _____

3. Does your company face the abuses of feasibility study?

   Yes ☐ No ☐

4. Which of the following types of abuses occurred in feasibility study is commonly faced by the construction company? Please tick where applicable according to the appropriate scale.

i. Misleading use of feasibility study

No	Types of abuses occurred in feasibility study	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
1	Do not carry out feasibility study properly					
2	Deliberately fraudulent occurred in feasibility study					
3	Do not follow governmental rules and regulations					
4	Ignoring some aspects of contractual requirement					

ii. Misunderstanding of study phases

No	Types of abuses occurred in feasibility study	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
1	Misunderstanding of conceptual/scoping study					
2	Misunderstanding of prefeasibility study					
3	Misunderstanding of feasibility study					

iii. Failure to undertake feasibility study that is fit for purpose

No	Types of abuses occurred in feasibility study	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
1	Misunderstanding of the objective of feasibility study					
2	Failure to achieve minimum standard of feasibility study (content, quality, deliverables, policy, and independent peer reviews)					
3	Inaccurately measure the potential of project					
4	Negligence in identifying the features of project					

Other types of abuses occurred in feasibility study (if have please state): _____

Section C: Causes of Abuses of Feasibility Study

What are the causes of abuses of feasibility study? Please tick where applicable according to the appropriate scale.

1. Planning and Estimation Factor

No	Causes	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
1	Poor skills of making assumption of resources					
2	Lack of information of market demand					
3	Poor cost and revenue estimate					
4	Poor time estimate					
5	Poor forecasting of cash flow					
6	Lack of land information					

2. Project External Issue

No	Causes	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
1	Lack of sustainability concern					
2	Lack of concern for legal issues					
3	Lack of concern for community stakeholders					

3. Personnel Factor

No	Causes	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
1	Lack of communication					
2	Lack of adequate team member to carry out feasibility study					
3	Lack of cooperation from top management (lack of firm decision deadlines)					

4. Developer attitude

No	Causes	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
1	Lack of time to carry out feasibility study					
2	Failure to progress through study phases					
3	Failure to plan for next study phases					
4	Failure to recycle through the study phases					
5	Failure to fix study scope					

Other causes of abuses of feasibility study (if have please state): _____

Section D: Effects of Abuses of Feasibility Study

What are the effects of abuses of feasibility studies? Please tick where applicable according to the appropriate scale.

1. Cost-related Effect

No	Effects	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
1	Increased in labor cost					
2	Increased in material and equipment cost					
3	Increased in indirect cost					
4	Monetary penalties					

2. Time-related Effect

No	Effects	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
1	Project delay					
2	Delay in feasibility study					
3	Procurement delay					
4	Delay in payment to contractor and workers					

3. Disputes

No	Effects	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
1	Conflict with project clients					
2	Conflict with community stakeholders					
3	Conflict with contractors and subcontractors					
4	Conflict with construction workers					
5	Conflict with local and national authorities					

4. Client-related Effects

No	Effects	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
1	Make wrong investment decision					
2	Profit loss					
3	Pay additional cost for changing contract requirement					
4	Delay in client decision making					

5. Quality-related Effects

No	Effects	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
1	Poor quality of feasibility study: Produce poor result					
2	Low quality of project					
3	Increase project risk					
4	Affect reputation of performing organization					

6. Performance-related Effects

No	Effects	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
1	Poor performance of project					
2	Project failure: Uncompleted building					
3	Poor performance of workers					
4	Low sales of constructed building					

Other effects of abuses of feasibility study (if have please state): _____

END OF QUESTIONS

&

THANK FOR YOUR COOPERATION