IMPROVING CONSTRUCTION MANAGEMENT: AN INVESTIGATION INTO THE INFLUENCES OF EFFECTIVE STAKEHOLDER INVOLVEMENT ON PROJECT QUALITY OUTCOMES

Amir Hossein Heravi

BSc (Civil), MSc (Construction/Project Management)

Submitted in fulfilment of the requirements for the degree of

Doctor of Philosophy (PhD)

Science and Engineering Faculty

Queensland University of Technology

2014

Keywords

Quality management, Project Quality, Stakeholder Management, Stakeholder Involvement, Quality Improvement, Project Life Cycle, Planning Process, Residential Building Projects

Abstract

Quality, in construction projects, should be regarded as the fulfilment of expectations of those contributors involved in all phases of such projects. Although a significant amount of quality practices have been introduced within the construction industry, the attainment of reasonable levels of quality in construction projects continues to be an ongoing problem. To date, although some research into the introduction and improvement of quality practices and the benefits of project stakeholder management has been undertaken, so far no major studies have been completed that comprehensively examine how greater consideration of stakeholders' perspectives, especially in the early project phases, can be used to contribute to final project quality outcomes.

This research aims to develop a framework to improve the effectiveness of stakeholder involvement during the project life cycle through better decision-making strategies in the project early phases, with the ultimate intention of improving project quality delivery. A review of the literature conducted to explore the critical factors that negatively affect project quality, concluded that the lack of application of appropriate management practices and inadequate involvement of key stakeholders are major problems that result in many quality issues during, and at the back-end of, the project lifecycle.

This research has adopted a mix-methods approach. Both survey and case study research techniques were used to collect the required data, by focusing on residential building projects. Collecting data from different sources using multiple enquiry techniques provides consistency and can potentially lessen probable bias that is related to some data collection strategies.

Questionnaire surveys were distributed, firstly to examine the current level of key stakeholder involvement during the project planning process, and secondly, to assess the degree of potential improvements that could accrue in resolving quality issues through implementing better stakeholder involvement strategies. In the next stage of data collection, the researcher undertook a number of case studies in order to investigate the potential approaches and underlying principles that could positively

contribute to enhance the engagement of stakeholders both the in planning process stage and during the whole project lifecycle.

Major findings of this research can be summarised as follows:

- the weaknesses and strengths of the contribution levels of different project team members during the various phases of the planning process were revealed;

- the degree to which quality issues can be improved, if extended contribution of key parties can be facilitated was examined in depth; and,

- the practices and approaches that can be applied to enhance the effectiveness and efficiency of stakeholder involvement were explored and categorised. These findings provided a structure from which a new Effective Stakeholder Involvement (ESI) framework is developed.

The ESI framework potentially contributes to the improved delivery of projects with higher quality level outcomes. It is expected that the development of this framework could also bring to the project some significant benefits in terms of reducing rework and wastage, improving timely delivery, avoiding disputes and preventing budget overruns.

Table of Contents

List of Figures

List of Tables

List of Abbreviations

PLC	Project Life Cycle
SI	Stakeholder Involvement
ESI	Effective Stakeholder Involvement
ESIF	Effective Stakeholder Involvement Framework
RSP	Residential Building Project
DM	Decision Making
BE	'Basis of Involvement' Elements
ME	'Mechanism of Involvement' Elements
S/M	Stakeholder/ Managerial
C/P	Cultural/Political
M/E/E	Material/Equipment/ Environment
O/W	Owner/Developer
C/PM	Construction and Project Management

Statement of Original Authorship

The work contained in this thesis has not been previously submitted to meet requirements for an award at this or any other higher education institution. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made.

Signature:

Date: 29/04/2014

Acknowledgements

I first and foremost thank God, for all His blessing and compassion. He gave me the hearing, sight, intelligence and affection. He helped me to know myself and gave me the power to believe in my passion and follow my dreams. All I did was impossible without the trust I have in him.

I would like to express my deepest gratitude to my principal supervisor, Dr Vaughan Coffey for all of his valuable advices and enthusiastic supports. Dr Coffey, you established an intimate and friendly relationship with me throughout this journey and, this gave incentives to prove to you my abilities and eagerness to improve my knowledge and skills. You always pushed me beyond my comfort zone and uncovered abilities I never knew I have. Thank you for believing in me, for your patience and supports. I am truly grateful to my Associate Supervisor, Associate Professor Bambang Trigunarsyah who provided me with great suggestions and truly valuable feedbacks. I really appreciate your encouragements, understandings and supports.

I am also grateful to my friends, colleagues and other staff in the Department of Civil Engineering and Built Environment for their continuing help, support and guidance, making my university life more enjoyable. I am also thankful to the many industry executives who participated in my data collection process and shared their skills and experience with me, providing richer insights into this project.

Finally, I express my sincere gratitude to my parents for all their prayers and blessings. Dear Mom and Dad, this journey would have not been started without your advices and encouragements and would be very hard to continue and accomplish without your supports. Thank you for everything and for giving me a family to be proud of.

Chapter 1: Introduction

1.1 PROBLEM STATEMENT

Much of the business management literature has shown that quality has played a significant role in business, manufacturing and engineering since Japan's advances in production and product quality in the 1950s (Deming 1986). Since this time, the theories of quality improvement, continuous improvement, total quality management (TQM), quality function deployment (QFD) and various other quality propositions have emerged and been employed (Haupt and Whiteman 2003; Applebaum et al. 2004; Koh and Low 2010; Lee and Yang 2012), aiming to improve the final quality outcomes of products and services.

Many construction firms have been critically challenged to achieve higher quality and in recent years, significant attention has been paid to implementing and improving quality management in construction projects (Hiyassat 2000). But, the high cost of fixing poor quality in such projects demands additional research to provide a practical framework to ensure achievement of high quality outcomes (Hiyassat 2000; Joaquin et al. 2008). Construction building projects are dissimilar in their characteristics to projects in other industries (Arditi and Gunaydin 1997). For example, almost all projects are unique, they have a longer lifecycle compared to many other 'products', there is no clear and universally accepted standard to evaluate overall project quality, owners have a high influence over the projects, and importantly construction project participants differ on each project (Wong and Fung 1999; Ortega and Bisgaard 2000; Yung and Yip 2010). Because these diverse and distinguishing features have made construction building projects different from projects in say industries such as manufacturing or production, some of the quality management systems that efficiently work for mass production industries, have not been considered appropriate for construction industry projects.

Construction building projects, from their early stages to the post occupancy phases are implemented through the efforts and involvement of various groups of people. These groups are referred to as the 'project stakeholders'. Freeman (1984)

describes the concept of 'stakeholders' as any group, or individual, who can affect, or may be affected by the outcomes of a corporation's objectives. Stakeholders can benefit or impede a project based on their power and intention to impact outcomes in accordance with their individual concerns and expectations (Olander and Landin 2008). This alone underpins the significance and relevance of conducting an inclusive analysis of stakeholder influence, in order to understand better how to undertake good management of stakeholders.

Correct management of stakeholders is significant to project outcomes and thus, the identification of the concept of stakeholder management has developed greatly in recent years (Yang 2010). Different perspectives of stakeholder philosophies have been expanded due to the growth of interest in improving the management and engagement of project participants. Jones (1995) classified stakeholder theory into three major approaches: descriptive, instrumental, and normative. In the view of Kolk and Pinkse (2006) the stakeholder concept can be explained through three themes of (1) recognizing the nature of stakeholders, (2) investigating how and under which circumstances, stakeholders can impact organisational decisions and operations and (3) determining different plans and strategies to deal with stakeholders. However, Freeman and McVea (2001) and Atkin and Skitmore (2008) suggest that any study of stakeholder management concepts should also examine the application of the perceptions of stakeholders to real world problems, and not only as pure research, which focuses exclusively on the development of stakeholder theory. Nevertheless, not much attention has been paid to "conceptualising the stakeholder notion in the context of projects as well as to make the notion operational for this context" (Achterkamp and Vos 2008, p.750).

Enormous resources, both human and material, are wasted annually in order to improve the quality of projects, but, although many quality management practices are implemented, achievement of high or acceptable levels of quality continue to be a problem in construction building projects (Joaquin,Hernandez and Aspinwall 2008; Moody 2005b; Jha and Iyer 2006; Leonard 2008). Many factors can result in the low level of final project quality such as, the use of faulty or low-quality raw materials, use of an untrained labour force, poorly maintained equipment and machinery and climatic conditions (Jha and Iyer 2006; Joaquin et al. 2010; Pheng and Wei 1996). Amongst these factors, is the lack of appropriate performance management of

different parties throughout the project lifecycle (PLC). It is highlighted that not only quality issues but also some other problems such as delays, increased cost and slow pace are the results of poor interaction and mismanaged relationship with major stakeholders (Bal et al. 2013; Aje 2012; Olander and Landin 2005a). As has been stated by many authors (Wateridge 1998; Achterkamp and Vos 2008; Boddy 2002; Cleland 1995; Joaquin,Hernandez and Aspinwall 2008), successful completion of projects relies largely on meeting the differing needs and expectations of participants who have a major effect on the project. Other researchers (Arditi and Gunaydin 1998; Yung and Yip 2010; Gransberg and Molenaar 2004) affirm the apparent role of project participants in determining the levels of quality in construction building projects and verify that achieving the preferred quality level, demand key stakeholders' effective involvement from the beginning through to latter project phases.

On the other hand, the significance of the project initial and planning phases has been advocated by scholars (Zwikael 2009; Cleland and Ireland 2006). Many of the most important decisions such as establishing the project requirement for quality, identifying project needs and objectives, agreement on project financing, schedule and organisation and setting up strategic directions are completed at these phases. Therefore any improvement plan should be designed and established in the project shaping stages (Joaquin,Hernandez and Aspinwall 2008; Kolltveit and Grønhaug 2004).

Although a range of quality practices are undertaken within the industry, the lack of effective management and involvement of stakeholder has led to the delivery of many poor quality construction projects. Walker (2000, p.21) states that "there is a gap in environmental quality management systems in ensuring that the contribution of stakeholder to project value in considered, evaluated and incorporated into the management process". This lack of integration also leads to dissatisfaction by the final consumers and other participants engaged throughout the project lifecycle.

Finally, while significant study into the introduction and development of quality practices and stakeholder management in the construction industry has been undertaken separately (Tang et al. 2009b; McIntyre and Kirschenman 2000; Arditi and Gunaydin 1997; Elghamrawy and Shibayama 2008; Yang 2010; Brian and

Martin 2008; Olander and Landin 2005a), no major studies have been undertaken to date to particularly determine how more effective stakeholder involvement can be facilitated to contribute to the ultimate quality of construction building projects .

This research therefore seeks to examine the following questions:

1. What is the current level of stakeholder involvement in the planning process of construction projects?
2. To what extent can effective stakeholder involvement improve construction project quality issues?
3. How can stakeholder involvement be strengthened and improved to assist construction companies achieve higher project quality outcomes?

1.2 RESEARCH AIM AND OBJECTIVES

The aim of this research is to develop a framework to enhance effective stakeholder involvement during the project lifecycle, by applying better decision-making mechanism in the planning phase. This framework subsequently, aims to contribute to higher quality outcomes of construction building projects.

Based on the research questions, the primary objectives are:

1. To evaluate the extent of current stakeholder involvement in the planning process of construction building projects.
2. To recognize the impacts of effective stakeholder involvement in improving the problems that construction building projects have with quality.
3. To develop a framework to improve effective stakeholder involvement in the project through the enhanced decision making strategies during the planning process in order to achieve better quality outcomes.

1.3 RSEARCH SIGNIFICANCE

This research provides a list of root causes of quality problems that help in developing a better method of introducing quality improvement and delivery concepts into construction building projects. The outcomes of this research are

crucial to gaining a better understanding of how stakeholder management concepts can be more successfully implemented in the construction industry and how it can improve the quality issue root causes. This understanding is based on the framework that integrates and incorporates the views of stakeholders about the practical approaches which can maximise the effectiveness of their involvement which will help to accomplish targeted quality and best practice processes to be applied to construction building projects.

The proposed framework provides project managers and owners with the required information and strategic direction to the more effective involvement in the projects and to achieve their own, and their stakeholders' main targets high quality project outcomes. This framework will significantly enable construction companies deliver better quality project. Through the use of this framework, it is envisaged that after adoption by construction companies, there can be improved outcomes in terms of meeting customer`s needs and requirements.

1.4 THESIS STRUCTURE

This thesis consists of eight chapters; a brief description of the content of each chapter is outlined below.

Chapter1 (Introduction): This thesis begins with an introduction of the background and discussion on the justification for the research along with a statement of aims and objectives. This is then, followed by a brief perspective of the significance and outcomes of the research.

Chapter2&3 (Literature Reviews): Chapter two discusses the available literature extant to the topic areas of this specific study. It provides explanations of quality and quality management, focuses on examining quality in construction projects and presents a comprehensive classification of quality problems and their root causes in the construction industry. This chapter critically discusses previous studies that have already been undertaken in the field quality management and improvement and highlights that, appropriate management of stakeholders and consideration to the important role of key project members in improving project quality issues, is missing from much of the literature. The review on the literature then continues in chapter three which examines the concept of stakeholder

management in the construction industry and evaluates the influences of project participants on the quality of project operations and outcomes. Following on, this chapter clarifies the relationship between stakeholder involvement in different phases of PLC and project quality and highlights the significance of the initial and planning stages as having high influence over the project lifecycle. Finally, the idea of effective stakeholder involvement in the project to assist in improving final quality delivery is proposed.

Chapter4 (Methodology): This chapter starts with the description of the philosophical position of the research. Research methodologies adopted for data collection and the justification for employing those methods are then explicated. In the subsequent section, the process of the research is graphically illustrated. This chapter explains the correlation between the research questions, objectives, data collection methods and data analysis techniques.

Chapter5 (Data Analysis-Part 1): This chapter presents an overview of the survey, designing the questionnaire, pilot study and sampling and lastly the results obtained to answer to the first and second research questions. This chapter examines and evaluate stakeholder's current level of involvement during the project planning process. It also explores the impacts of better stakeholder involvement in improving quality issues and concludes with a summary of findings.

Chapter6 (Data Analysi-Part2): This chapter presents the results obtained to answer to the third research question. In the first section, it gives a brief description about the nature of the selected cases, how they were selected and the number of people who have been interviewed. The second section presents the method of analysis, coding of the collected data and how the analysis process was conducted. This chapter, then, presents the findings from interview analysis in two parts. The first part identifies barriers and problems of stakeholder involvement and, the second part investigates and examines the approaches and elements that will lead to better engagement of different parties. Effective stakeholder involvement framework (ESIF) which is developed from the analysis is presented in this chapter. It also validates the ESIF and presents the final version of the framework.

Chapter7 (Discussion): Based on the analysis adopted in the previous two chapters, chapter 7 discusses the findings and clarifies the relationship between the findings and the research questions. It also discusses the implications of the ESIF and shows how this new framework can help to enhance stakeholder involvement as well as to improve certain quality issues.

Chapter8 (Conclusion): This is the final chapter in this thesis. It outlines a summary of the major findings, discusses the general conclusions of the study, and describes significance of the research and recommendations for future research projects.

Chapter 2: Quality and Quality Management

2.1 INTRODUCTION

This chapter provides an overview of the literature review conducted to inform this research and focuses on the most important concepts of quality and examines the concept of utilising quality management systems for improving construction project quality outcomes. It clarifies the perceptions of quality related to construction projects and examines previous studies on this and related topics. Common problems of poor quality outcomes in construction building projects are identified and the major causes of these quality issues are then examined and collected. This research uses current available classifications of root causes of quality problems found in the extant and current literatures. It attempts to bring together a set of the most notable factors influencing quality by categorizing them under four main headings. Following their classification, this chapter then focuses on investigating the role of key stakeholders in determining quality levels during the planning and other stages of projects. The chapter then highlights the gap of inherent knowledge that exists in previous research studies and confirms the need for the integration of the two concepts of quality management and stakeholder management. It examines the impacts of the power of key project stakeholders to improve the perennial problems of poor quality and disputes that lead to an often-marred image of construction projects. This chapter finally clarifies that although the individual concepts of stakeholder management and involvement have been emphasised by many scholars as an important factor that affects quality, the issue of how the integration of these concepts can lead to greater improvement of quality outcomes, has not to date been fully adopted or addressed in building projects.

2.2 THE CONCEPT OF QUALITY

The concept of "quality" has been around for a long time and continues to be a significant issue for discussion today. During the last two decades quality systems have been receiving increasing attention from researchers and authors (Jafari and

Love 2013; Basu 2013; Coffey 2011; Jha and Iyer 2006; Arditi and Gunaydin 1997; Ortega and Bisgaard 2000) especially with regards to improving quality outcomes, avoiding wastage and cutting quality costs (Basu 2013; Jafari and Love 2013; Marosszeky et al. 2002). According to Chan and Tam (2000) the finished product, in any industry, should meet required standards which satisfy customers and other key stakeholders.

Quality has been variously defined as 'value', 'conformance to specifications' (Gilmore 1974), 'conformance to requirements' (Crosby, 1979), 'loss avoidance' (Ross 1989), and 'meeting and/or exceeding customers' expectations' (Parasuraman et al. 1985). To Deming (1986), the only meaningful definition of quality was "that which the consumer specifies".

Despite of the amount of different definitions that abound, and the relative complexity of finding a universally acceptable definition of quality, there is no doubt that the original requirement of building projects, to promote quality standards from inception through to commissioning, maintenance and eventual disposal of built facilities, has increased to the need for improved quality assurance (QA) within the industry (Pheng and Hwa 1994). Dalela (2001, 58) describes quality assurance as "all those planned and systematic actions necessary to provide adequate confidence that a product or service will satisfy given requirements for quality". Moreover, project quality managers should consider quality control (QC) as an important basic process in shaping and actuating quality systems. Abel and Mangino (2003, 4) state that "QC is a system of routine technical activities, to measure and control the quality of the inventory as it is being developed". QC is designed to: (1) provide consistent and routine checks to ensure data integrity, correctness and completeness, (2) identify and address errors and omissions and (3) document and archive inventory material and record all QC activities. Correct implementing of QA and QC are essential to achieve a high quality project, yet many other factors such as, the capability of management leadership (Joaquin,Hernandez and Aspinwall 2010), the quality of materials and equipment and workforce skills and knowledge are also important in producing good quality (Adenuga 2013).

Juran (1989) developed a significant managerial procedure for top management that include quality planning, quality control and quality improvement. In an

inclusive classification, Hoyle (2009) proposed the integration of three aspects of quality namely; "the product quality", "the business quality" and "the enterprise quality" dimensions. While product quality focuses on the product or services to meet particular customer's needs, the business quality refers to the business serves the demands of stakeholders. However, enterprise quality more comprehensively, meets the needs and expectations of all stakeholders, increases the effectiveness and focus on both internal and external organisations strategies. Accordingly it appears that the most significant practice to improve the quality might be to enhance enterprise quality, which effectively impacts on all quality aspects (Hoyle 2009).

Deming (1986), placed great importance on the responsibility held at management level, for impacting on quality, affirming that management is responsible for 94% of quality problems. Leonard (2008) states the need to focus on structured systematic long-term quality to overcome the short-term trends and the need for an over-zealous inspection process. Correct planning and implementation of established quality system principles facilitates the detection and resolution of potential defects during the manufacturing (i.e. the construction) process and this can significantly decrease the number problems which can be identified by final customers (Forcada et al. 2013).

Because the focus of this research is on investigating the quality improvement factors, it is essential to identify and examine various aspects and specific factors that play an important role in determining the levels of quality in construction projects. Therefore the next section provides an in-depth clarification of quality requirements and issues in relation to these types of projects.

2.2.1 Quality in Construction Projects

The construction sector has, over the last two decades (1990s), been viewed as being resistant to modifying its practices and is therefore benchmarked internationally as being basically uncompetitive when compared to other sectors (Low and Hong 2005; Haupt and Whiteman 2003). In order to alter this image, which clearly is one of the factors that prevents construction companies from expanding and being more competitive in global markets, a more focused approach to quality issues such as appropriate quality planning, control and assurance needs to

be adopted (Farooqui and Ahmed 2009a). These authors (ibid 2009a) also note that 'quality' needs to become the new business philosophy of any organisation. The 2005 version of ISO 9000 (2005) also reinforced this view with the clear identification of the eight quality management principles that are critical for continuous improvement which are:

- Customer focus;
- Leadership;
- Involvement of people;
- Process approach;
- System approach to management;
- Continual improvement;
- Factual approach to decision making; and,
- Mutually beneficial supplier relationships

These principle concepts should be able to help project leadership team to establish and implement their quality management systems (QMSs), in the way that enables their organisations to employ a systematic approach to quality management. Quality and performance enhancement can be very difficult to recognize and measure, without the initiation of efficient QMSs among key participants on construction projects (Love and Li 2000; Tang et al. 2009b). As stated by Hirao (1994, 23), "company-wide quality management has become a major concern for industries and businesses all over the world". However, in the construction industry the understanding of quality issues and application of quality tools among project members has been more complicated due to the reactive nature and complexities of construction projects (Serpell 1999). A number of researchers have provided some explanations for the general level of quality and quality management in construction industry projects (Hiyassat 2000; Duncan et al. 1990; Mohammed and Abdullah 2006). As stated by Duncen (1990), quality in the construction industry is an established approach to improve capability and provide reliable product, projects and services in accordance with a specified level of quality within agreed budget and schedule.

A quality management system (QMS) in the construction industry is different from that in other industries such as manufacturing. This variation according to Rumane (2010) is because a QMS in the construction industry includes not only the quality of projects, but it also encompasses the management approach to meet the purposes provided by clients. In the view of Mohammad and Abdullah (2006, p.1) a quality management system in construction is "the interaction of people, processes and documentation to meet both customers' stated and implied needs". Other authors have explained that quality on a construction project is the degree to which key stakeholder's expectations and satisfaction can be fulfilled (Sanvido et al. 1992; Barrett 2000). Nonetheless, according to Barrett (2000) this can be achieved if construction companies adopt an effective strategy to address those performance criteria that specifically affect key stakeholders with an emphasis on continuous improvement. Hwang and Lim (2013) noted, that in construction projects the importance of quality is perceived to be higher than time and cost . These authors (ibid 2013) also observed that although the importance of cost and time is undeniable and cannot be ignored, quality has to ultimately satisfy the owner's expectations and requirements.

In addition, achieving high quality outputs can ensure better marketability of constructed output in the future, and increase the confidence of clients. Nevertheless, due to the complexity of defining high quality, or what is needed to meet the requirements of quality, the actual level of quality required is sometimes unclear. Even though many of the pioneers of the quality movement, proposed their own definitions of quality, ISO standard (9000:2005), as cited in Quality System Handbook (2009) generally defines quality as "the degree to which a set of inherent characteristics fulfils requirements". This means that in the construction industry, quality appears to be accomplished whenever the needs and requirements of those entities, parties and individuals involved in projects or delivery of services, such as project managers, customers, consultants and other key stakeholders are fulfilled. This is consistent with the inclusive classification of an ASCE (1988) study as cited in (Arditi and Gunaydin 1997), stating that, quality in the construction industry, can be characterized as follows:

- Meeting the requirements of the owner
- Meeting the requirements of the planners and design professionals
- Meeting the requirements of the constructor of a project
- Meeting the requirements of regulatory agencies (government, professional institutes) and others.

This comprehensive report reviews the current understanding of quality in the construction projects and therefore is used to inform this research. It verifies that in order to achieve the preferred quality in the industry, the perspectives of the main project participants should be taken into account. Pheng and Wei (1996, 45) reinforce this view and state "Clearly, the whole construction industry is project-oriented, so improved quality performance must be project-related and include the whole project team". Olander (2005a) highlights that stakeholders can influence the project and project management process, it is therefore imperative to identify and communicate with stakeholders extensively in order to understand and assess their ability to impact on the project and its quality outcomes (Olander 2007; Olian and Rynes 1992). However, it appears that this idea has not been adequately considered in the planning and implementing of quality systems in construction projects and Walker (2000, 21) highlights that "there is a gap in environmental quality management systems in ensuring that the contribution of project participants to project value is considered, evaluated and incorporated into the management process".

Problems of quality in both the civil engineering and construction industries still continue to affect these sectors and their projects (Joaquin,Hernandez and Aspinwall 2008; Leonard 2008; Mohammed and Abdullah 2006; Farooqui and Ahmed 2009a). All of this evidence underpins the need to identify and clarify the root causes of such problems prior to proposing solutions to overcome them. The next section provides an overview of quality problems/defects which are common in construction building projects.

2.2.2 Quality Problems in Building Projects

Establishment of required operational and production standards, and achievement of acceptable levels of quality, in construction building projects has

long been a problem (Leonard 2008; Arditi and Gunaydin 1997; Jha and Iyer 2006). Many studies have been conducted that examine methods for improving quality of infrastructure and commercial projects, yet investigations on improving the quality in the residential sector has to date been limited (Sommerville and McCosh 2006; Egan 2002). However, in recent years, increased focus on the operation of quality management systems and greater calls for improvement of outcomes in the residential sector, as result of a multiplicity of defects, often highlighted in the popular media have received considerable attention (Mills et al. 2009; Forcada et al. 2012). In a recent study (Basu 2013), the low quality level of planning and design, lack of high quality of the project execution process and poor quality of communication among key stakeholders have been identified as factors contributing to major project failures. Other scholars suggest that inadequate risk assessment and quality management are important causes of project failures (Jamieson and Morris 2008; Abdelsalam and Gad 2009). Poor quality performance that results in increased rework and has significant impacts on cost and schedule are amongst the major issues experienced in construction projects (Leonard 2008; Kanji and Wong 1998). Drawings and specifications are not produced at satisfactory levels of quality and do not always clearly state/show the intention of the designer (Pheng and Wee 2001; Pheng and Wei 1996). According to Arditi (1998) these documents (drawings and specifications) are the final result of the design phase that precedes the physical construction of the project, and can have a significant effect on the quality of the final project outcomes.

A number of scholars (Joaquin,Hernandez and Aspinwall 2010; Seaver 2001) have stated that successful companies need to meet their customer expectations through superior implementation of their quality policies. However, despite guidelines such as these being mentioned in the extant literature (Hoyle 2009; Joaquin,Hernandez and Aspinwall 2008), currently many customers are still not satisfied with the final quality of their constructed projects (Leonard 2008).

Serpell (1999) points out that lack of qualified personnel is a major barrier in the compliant implementation of quality systems. For example, the lack of knowledge and skills amongst contractors results in poor design interpretation and cannot provide the end results on construction sites in accordance with the original contract design and specifications (Pheng and Wei 1996).

In addition, in the view of Jha and Lyer (2006) 'quality negligence' produces many negative effects resulting in construction companies not achieving the desired levels of quality. Additionally, low quality process implementation often leads to the ultimate poor quality of projects (Hiyassat 2000). Incomplete and incorrect assessment of stakeholder's requirements, poor sub-contractor and trades licencing arrangements are factors that give rise to major quality problems within the construction industry and related sectors. Although on-site supervision by contractors is critical, especially if the work is sub-contracted (Arditi and Gunaydin 1998), yet some main contractors do not have a well-established supervision and monitoring systems (Adenuga 2013). The objectives of the main contractor and subcontractors are often different. For example, in order to save time and money, the subcontractors sometimes may finish the work as fast as possible, and this will result in them producing a lower quality output (Wong and Fung 1999). On the other hand, the main contractors are responsible for delivering the projects in accordance with the client's requirements and therefore they need to align the objectives of their subcontractors with the needs and expectations of the client. Moreover, lack of attention to a quality-based supportive work environment, wastage of materials, high fragmentation of systems (Bhimaraya 2005) and manpower and duplication of cost, are highlighted as quality problems in construction projects. These unsatisfactory issues continue to seriously affect most sectors of the industry and projects (Arditi and Gunaydin 1997).

Many of these factors covered in the preceding sections of the chapter have resulted in increasing substantially the final cost of residential building projects (Al-Najjar 2008). To compensate for an increased cost of the project and to keep market share and retain customers, some building and development companies may engage the least expensive subcontractors and suppliers or use generally lower quality materials (Pheng and Wei 1996). Since it is the subcontractors who construct the actual project on site, engaging those with inappropriate knowledge and experience has a considerable negative impact on the final quality outcomes (Leonard 2008). Table 2.1 provides an overview of quality problems and shortcomings which are common during construction building projects.

Table 2-1: Quality Problems

Quality Problems/Issues	Authors
Customer dissatisfaction	(Joaquin,Hernandez and Aspinwall 2010; Pheng and Wei 1996; Leonard 2008; Arditi and Gunaydin 1997)
Quality negligence	(Jha and Iyer 2006; Kazaz and Birgonul 2004)
Non clean /safe construction site	(Pheng and Wei 1996; Leonard 2008)
Non clear-precise drawing	(Pheng and Wei 1996; Arditi and Gunaydin 1998)
Lack of meeting standards/codes	(Pheng and Wei 1996; Moody 2005b; Wong and Fung 1999)
Poor application of statistical methods	(Joaquin,Hernandez and Aspinwall 2008; Arditi and Gunaydin 1997)
ISO fault implementation	(Chan and Tam 2000; Pheng and Wee 2001; Marosszeky et al. 2002)
Traditional quality attitude	(Mohammed and Abdullah 2006; Leonard 2008)
Low quality Materials/Equipment	(Pheng and Wei 1996; Hiyassat 2000; Pheng and Wee 2001; Cornick
Lack of qualified personnel	(Serpell 1999; Chan and Tam 2000; Leonard 2008)
Non availability of document	(Jha and Iyer 2006; Pheng and Wee 2001; Serpell 1999)
Poor quality performance	(Chan and Tam 2000; Kanji and Wong 1998; Leonard 2008)
Poor quality inspection	(Leonard 2008)
Lack of measurement and feedback system	(Moody 2005a; Arditi and Gunaydin 1997; Joaquin,Hernandez and Aspinwall 2010)

Table 2.1 illustrates that building projects are still encountering many quality problems. One effective way to eliminate or improve these defects is to identify, examine and improve their major root causes. The next section explains how this research identifies and categorises major root causes and other sources of quality issues

2.3 MAIN CAUSES OF QUALITY DEFECTS

Quality issues on building projects usually result from a number of sources, which can contribute to increasing customer dissatisfaction. However, if construction companies do actually attempt to overcome or improve the perceived major root causes, then a significant improvement in the quality of final constructed projects is expected. Various authors have provided different categorisations of quality problems (Arditi and Gunaydin 1997; Jha and Iyer 2006), but there have been few attempts to collect together and unify the major causes and factors that affect quality

in a comprehensive manner, or specifically focused on residential building projects. According to Chan and Tam (2000), factors that influence project quality can be generally categorised under the headings of project, client, project team leaders, project and project management process, and project environment . They (ibid 2000) noted that quality performance is a function of the activities, and derives from the attributes of the factors corresponding with each of these categories. It has been advocated that client aspects such as; the level of proficiency in terms of ability to make strategic decisions, defining roles and responsibilities and clarity of the mission impact upon the quality of a project (Olander and Landin 2005a; Naoum and Mustapha 1995).

Project specific characteristics such as scope, nature and complexity are regarded by some authors as having a significant influence on quality performance (Walker 1994; Chan and Tam 2000). The project team, in the construction industry, is considered as a group of professionals from different organisations who form together to conduct the necessary planning, design and construction processes to implement a project. However, the performance of the team that largely depends on their skills, expertise, knowledge and working relationships, is a major determinant for project quality (Joaquin,Hernandez and Aspinwall 2008; Basu 2013). It is believed that the project quality is also impacted by procedures adopted during different stages of planning, design and construction.

The unique nature of building industry, the fact that no two projects are exactly similar, placed a great responsibility on the project leaders to establish different processes that will assist their projects to achieve high quality delivery. The project team deals with decision making, setting project objectives and strategic directions, designing the structure and setting up a monitoring process. Inappropriate decisions made or ineffective actions done by the project team can reflect on the whole construction process resulting in cost, time and quality issues (Wang and Huang 2006; Yung and Yip 2010).

This research uses these classifications of quality problems found in the extant and current literature and attempts to bring together a set of the most notable factors influencing quality by categorising them under four main headings showing in the following Figure 2.1.

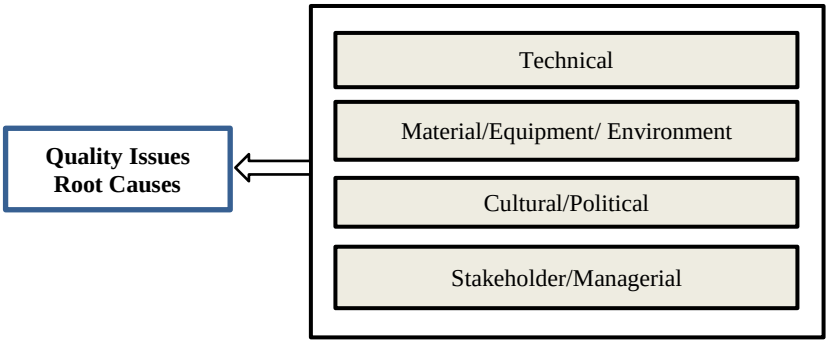


Figure 2-1: Categories of quality issues

This categorised model provides a source for arranging information that will be used as a foundation for developing and evaluating an improved framework proposed for use as a tool for better quality planning and implementation, driven by enhancement and high effectiveness of stakeholder involvement, in construction building projects.

2.3.1 Technical

Many identified quality defects in the later stages of a residential building project are the result of technical defects during and in the front-end of the project lifecycle. According to Sommerville and McCosh (2006) technical defects will occur when the workmanship and design of a building element is impacted upon by inappropriate functionality. As stated by Pheng and Wei (1996) most of the time drawings and specifications do not clearly indicate the intentions of the designers. Because drawings are among the most important documents given to the constructor to illustrate the design concept, size and scope of the work, number and dimension of materials or items, then provision of inadequate information by way of poor drawings and specifications can leads to a lower quality of final constructed project (Arditi and Gunaydin 1997). In certain cases, when the design is complicated, the drawings and details may not be fully understood by the contractors and as a result, the final project will not be consistent with the original intention of the designer (Pheng and Wee 2001). It has been emphasised that the relationship between non clear/precise drawings and poor coordination among project participants has a similar detrimental effect (Pheng and Wei 1996).

In addition, although the establishment of a data collection system can help construction companies to set up information base which can lead to an earlier

recognition of defects (including quality defects), however, creating such a system is difficult and results in recurring defects (Arditi and Gunaydin 1997).

Despite the expressed benefits of their use in many other industries, quality tools and techniques have generally been disregarded by many construction companies. Leonard (2008), in his study of quality implementation factors, indicated that only one out of 22 contractors had used quality tools such as Six Sigma, lean 5S and statistical process control charts. He (ibid 2008) also observed that only a few builders had inspection processes operating in the front-end phases (planning and design) of projects. These limited applications of quality techniques have led to a less comprehensive overall understanding of quality (Abdul-Rahman et al. 1999) and ineffectual problem-solving methods.

Poor construction practices due to the low quality performance of incapable contractors and subcontractors can substantially contribute to quality defects in constructing the project (Assaf et al. 1995). Although functionality of the system is considered to be one of the most important determinants of the quality of final the project, to date it has received a little attention in the upfront planning and design stages (Moody 2005a). In addition, sometimes the design does not correspond with the related codes and standards and this leads to a considerable amount of rework and delay in completion of the project, as well as lowering the expected quality level (Pheng and Wei 1996). While contractor's practices are an important factor affecting the quality, the on-site teams often pay more attention to the completion of the project within the timeframe and available budget, rather than achieving quality; this is in direct conflict with meeting the customer's expectations of quality.

2.3.2 Materials, Equipment and the Environment

The literature suggests that project specific factors can sometimes adversely affect quality and customer satisfaction (Joaquin,Hernandez and Aspinwall 2008; Jha and Iyer 2006; Chan and Tam 2000; Walker 1994; Ortega and Bisgaard 2000). Some of these factors include project nature, uniqueness (Kanji and Wong 1998; Chan and Tam 2000), project size and scope (Jha and Iyer 2006), environment, and complexity of project (Chan and Tam 2000). Project complexity can be measured by factors such as site access and conditions, design coordination and use of innovative technology

(Chan and Tam 2000). Any of these factors, if not appropriately identified and considered, can lead to the poor quality of the final project. For example, if the size of a project is too large, the monitoring and inspection process may be limited and this can adversely affect the quality (Jha and Iyer 2006).

Severe climate conditions raise the workforce fatigue, resulting in ineffective work and poor quality (Jha and Iyer 2006). In addition any lack of attention to appropriate resources such as finance, materials, human and technical resources, are also causes which can result in poor quality projects (Joaquin,Hernandez and Aspinwall 2008; Yung and Yip 2010). Low quality construction materials have been regarded as having a notable impact on projects quality. When a quality defect in a project is related to defective materials, it implies either the material itself, or the suitability of the material was faulty for the conditions in which it was used (Parteous 1992). Adenuga (2013) researching the factors affecting quality, observed that the selection of materials ranked the highest among quality control factors applied in assessing compliance levels to quality assurance standards. According to Pheng and Wei (1996) construction materials which are chosen by contractors do not always meet the standards of building control authorities or of the designer and this has an negative impact on project quality. This suggests that contractors and suppliers should be fully aware of and take into consideration, the standards and requirements, when selecting the materials. If the characteristics of materials are different from each other, possibly they are only suitable for use under different situations (Pheng and Wee 2001). For instance, Forcada et al. (2012) found that most of the floor defects in apartments could be associated with using low quality materials or aesthetic defects such as cracked or stained tiles, or damages due to a lack of protection during the construction process. One approach to reduce these defects, as suggested by Georgiou (1999),is to increase the level of inspection and control during the construction process, although it might raise the construction cost.

Furthermore, the availability of resources is an important issue that needs to be considered during the project initiating stages (Forcada et al. 2012). It is likely that if the required resources to implement the project are unavailable or hard to access, the quality and cost of the project are negatively affected.

2.3.3 Cultural and Political

Although generally cultural and political issues may have directly the lowest impact on project quality, they still need to be taken into account. Organisational culture influences employees' activities and behaviours and therefore requires to be monitored and if necessary changing. While strong and driven people will usually more efficiently participate in the project, lack of motivation and care, regardless of how it is created, are considered as most frequent human traits impacting on quality defects (Porteous 1992; Serpell 1999) and for reducing the work efficiency (Marosszeky et al. 2002). Evidence suggests that it is the responsibility of the management team to encourage employees to be part of the project (Serpell 1999; Marosszeky et al. 2002). Nevertheless, sometimes the culture of project team members is a barrier to enhancing their participation. As stated by Leonard (2008) quality culture is a significant factor in successful implementation of quality and if the performance of employees of a construction project is recognized and valued in an appropriate manner and with the appropriate amount of care, then motivation will become a necessary driver of a strong quality culture (Chung 1999; Pheng and Wee 2001). Decision makers therefore need to set up activities to achieve workers' commitment to any quality improvement systems (Serpell 1999).

In addition, according to Marosszeky (2002) low tendency to engage fully in teamwork among project employees is the consequence of a variety of factors and management teams are responsible for eliminating such a dynamic. Inappropriate tendering procedures also lead to poor quality. For example, aggressive competition during tendering forces participants to bid lower than the feasible construction price for completion of the project and to also to allow companies to make a reasonable level of profit. Such attributes subsequently result in the application of imperfect materials and an inferior technical performance and this can result in lower quality in projects (Chan and Tam 2000; Jha and Iyer 2006).

Political (or statutory regulation) issues can in some cases be the origins of many problems on projects that indirectly impact upon quality. For instance, implementing the project in most cases requires approval from the government authorities that have high influence and can stop or postpone the project progress, or in extreme cases even 'kill' the project (IFC 2007). Any conflict among project

leaders and regulators/statutory bodies can delay the project, impose additional costs and lead to other quality issues (IFC 2007).

2.3.4 Stakeholder/Managerial

According to some authors, stakeholders are often recognised as being responsible for many of the current quality problems/defects that occur in construction building projects. As stated by Jha and Lyer (2006) one of the most important factors which has an indisputable effect on project quality is inefficient communication between parties involved in construction projects. They (ibid 2006) consider "human elements rather than machinery" and good communication among parties as critical factors to achieve good quality. Other authors, such as Arditi and Gunaydin (1998), confirm that high quality projects mainly depend on the relationship among parties involved; however, to date, the idea of a greater and organised communication amongst the key members of a project has not specifically been considered in the construction industry (Mohammed and Abdullah 2006).

To achieve the desired level of project quality, one of the most substantial issues is the efficient implementation of key project management practices (Anderson 1992). Results of a survey that identify problems of implementing ISO standards shows that lack of management commitment is an issue which mostly resulted from lack of awareness of the benefits of implementing a quality system (Hiyassat 2000; Chew and Chai 1996). Other authors found that poor understanding of the standards and low level of knowledge about the documentation process, constituted barriers to correctly implementing a quality management system. It is highlighted that there is poor clarification of project quality dimensions and its implementation by the main project stakeholders (Abdelsalam and Gad 2009; Jamieson and Morris 2008; Zou et al. 2007).

Moreover, lower than expected quality outcomes in many cases are the result of inappropriate management functions. According to Yung and Yip (2010), management roles and issues have a significant impact on project success. Amongst the other factors that may result in quality problems is the apparent lack of incorporation and emphasis of the views of owners, that prevents these important stakeholders from properly articulating their needs and objectives (Gransberg and

Molenaar 2004). According to Pheng and Wei (1996), ignorance of quality issues by contractors is a major factor negatively affecting quality. Contractors poor understanding of the intent of design drawings will often result in ineffective construction and poor on-site productivity in the project (Doloi 2013). It is also argued that due to the lack of knowledge to establish a quality system, contractors sometimes cannot control the work properly (Jha and Iyer 2006; Pheng and Wei 1996). Pheng and Wei (1996) noted that one of the main challenges in better implementation of quality is to interact with of subcontractors in the planning and construction process . Because the subcontractors are directly responsible for the on-site work, their understanding of, incorporation with and internal communication on, quality initiatives is highly significant (Leonard 2008; Wong and Fung 1999; Pheng and Wei 1996). According to Tam (2011) " the multilayer chain subcontracting system which is widely used in the construction industry, encourages improper work practices by subcontractors and involves long chains of command, thereby contributing to poor quality performance, communication, and coordination". From a subcontractor's perspective, whereas the lack of adequate information and overlapping activities may result in some reworks, cost overruns and poor quality performance, efficient coordination by the main contractor can greatly prevent this trouble.

Furthermore, the necessity for supplier involvement in any programme for quality improvement has been pointed out by a number of scholars (Joaquin,Hernandez and Aspinwall 2008, 2010; Saraph et al. 1989). Arditi and Gunaydin (1998) affirm that supplier involvement and integration in the project team can help in decreasing divergence in the construction process.. Jha and Iyer (2006) observed that conflict among project participants affects negatively the quality performance criteria. For example, in an organisation when the people in higher levels pass the responsibility of any faults to the people in lower levels, it is unlikely that preferred quality will easily be achieved.

Besides, the problem of achieving high quality will increases, if developers award the project to the lowest bidder, especially where the tendering exercise is part of a package of multiple projects (Forcada et al. 2012). Unskilled contractors and subcontractors can cause many quality problems during the construction stage of a building project. These problems, to a certain degree, are the results of inappropriate

supervision and monitoring of their work, however this issue can be avoided with appropriate planning by the project management team in relevant stages of the project (Assaf,Al-Hammad and Al-Shihah 1995; Forcada,Macarulla and Love 2013). Clients' lack of engagement in defining and setting quality requirements for projects built by developers, often results in a perception of poor quality when the project is completed (Forcada et al. 2012). Inadequate monitoring and verification processes and improper or missing policies to check that the design and, material and resources will satisfy specific quality requirements can cause costly errors.

Insufficient and unclear definition responsibilities and incorrect or inadequate details of specification in the tender documents can also lead to many quality defects arising during design, construction and operation phases (Hiyassat 2000; Joaquin,Hernandez and Aspinwall 2008). Joaquin (2008) states that quality policy should be part of the strategic planning process aiming to enhance the communication throughout the company and to ensure that important quality objectives are implemented. However it cannot be accomplished unless top management has a customer-oriented attitude and makes a regular communication with other key members in the company (Dale 2003). It was found that poor interaction with designers from the project beginning stages, results in producing drawings and specifications, which do not fully conform to, or are sometimes substantially different from, the objectives of the client.

Finally, the challenges of unreasonable and wrongly focused stakeholder perspectives about the project and its expected outcomes, as a result of poor communication and interaction among key stakeholders, may result in quality problems (Olander 2006; Jha and Iyer 2006).

Figure 2.2 provides a comprehensive framework which groups the main sources of quality issues and their corresponding factors in construction building projects. The aim of such grouping is to facilitate the subsequent investigation as to what extent quality issues can be improved through more effective stakeholder involvement.

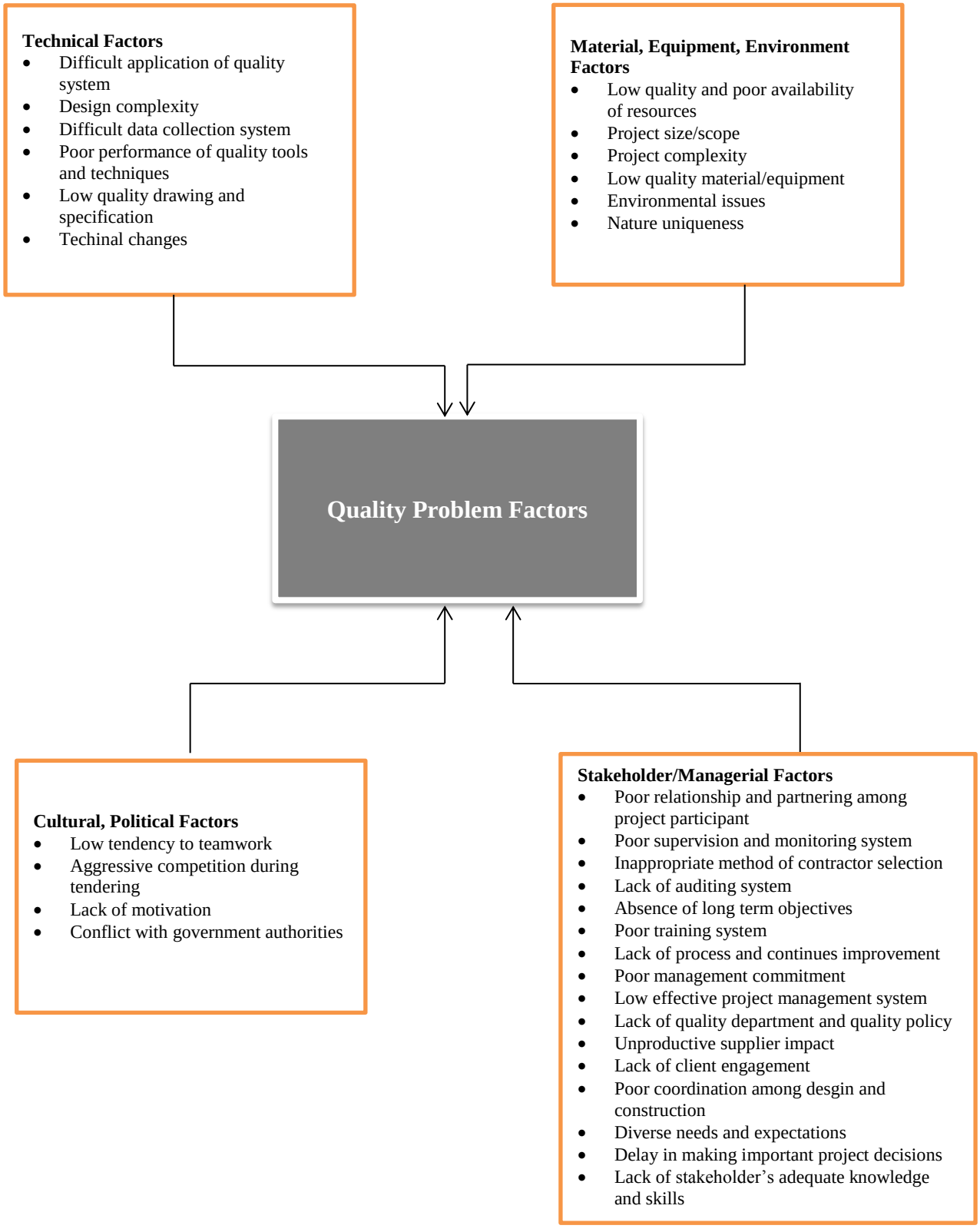


Figure 2-2: Main Causes of quality issues in building projects

These factors, identified and supported by many authors (Wong and Fung 1999; Josephson and Hammarlund 1999; Yung and Yip 2010; Arditi and Gunaydin 1998; Leonard 2008; Jha and Iyer 2006) also demonstrate and highlight that one of the barriers which most often results in successive serious defects in construction building projects is missing. Poor stakeholder management, specifically a lack of project participant engagement in project strategic processes, is not shown in the standard list of factors. Whilst stakeholder involvement has been emphasised as an important factor that affects quality, this issue has not been fully adopted or addressed in building projects generally (Marosszeky et al. 2002; Leonard 2008; Gransberg and Molenaar 2004; Joaquin,Hernandez and Aspinwall 2010; Saraph,Benson and Schroeder 1989; Chan and Tam 2000; Serpell 1999; Yang 2010; Josephson and Hammarlund 1999; Wong and Fung 1999). Walker (2000) highlights this gap in previous research studies and affirms that the implementation of quality efforts is often hindered by a lack of attention to the expectation of the stakeholders' views of quality in the construction industry. This constitutes a major reason why this research undertakes to evaluate and clarify the significance of the roles of stakeholders in, and their impact on, building project quality.

2.4 THE RESEARCH GAP

Quality failures/issues originate from several major root causes. This research, through the content analysis undertaken during the literature review, classified those causes into four main categories namely technical, /material/equipment/environment, cultural/political, and stakeholder/managerial. It emerged from this exercise that during the project life cycle, the majority of typical quality issues and failures originate form one of these sources. So, a thorough examination of the influences of each category on the final project quality is critical. Technical category includes those problems, which are mainly related, to design and technical issues and originates from inappropriate application of tools, techniques and systems. For instance, low quality drawings (Arditi and Gunaydin 1998)and ignorance of the application of quality tools in order to measure and control the quality (Leonard 2008) are among such important issues. Certain failures result from the materials and environmental issues. For example, the unique nature and various complexities of construction projects usually are a big challenge to contractors actually obtaining the desired level of quality (Chan and Tam 2000; Jha and Iyer 2006).

Earlier, low quality of resources such as financial, human and material resources have been identified as factors adversely affecting quality (Yung and Yip 2010). In addition, political and cultural matters, such as inappropriate tendering procedures or low tendency to teamwork, have also been viewed as one of the contributors to poor quality in certain cases (Marosszeky et al. 2002).

However, factors associated with stakeholder/managerial category are considered among the most fundamental and important causes of quality failures in many cases. The critical roles played by owners, management team, designers, contractors, sub-contractors, suppliers and final customers on project quality success has been emphasised by many researchers (Wong and Fung 1999; Leonard 2008; Arditi and Gunaydin 1997; Yung and Yip 2010; Tang et al. 2009a). Nonetheless, not many studies have focused on how effective project parties' integration can potentially impacts upon quality issues.

In spite of the overall understanding of general factors associated with poor quality, construction industry practices still require further research, especially in areas such as improvement in terms of responsibility sharing and deliberations among the key project's stakeholders. Greater involvement in assisting in preparing quality management plans and shaping strategic project directions will not only facilitates construction companies to solve those problems directly related to stakeholders, but is also a great help to overcoming other problems which arise from other sources of defects such as technical and cultural. For instance, in an investigation done by Pheng and Wei (1996), appropriate incorporation between stakeholders in the design and construction phase resulted in higher quality of drawings and specifications. Other researchers recognise that management has a significant responsibility for encouraging employees to work as a team and advocate the significant influences of teamwork on final project quality (Marosszeky et al. 2002; Joaquin,Hernandez and Aspinwall 2008; Jha and Iyer 2006).

Such observations highlight the importance of, and need for, greater stakeholder management and consideration of the potential positive impacts on management of quality. However, the perspective on stakeholder management that identifies and examines how project participants can positively contribute in achieving higher quality delivery in construction building projects is missing from

much of the literature. In order to bridge this gap this research focuses on improving the efficiency of stakeholder management through a more effective stakeholder involvement plan as a major step toward achieving better quality outputs.

2.5 SUMMARY

This chapter presented the current literature on quality issues and quality management with a focus of its definition and application in the construction industry. It explored the extant and current literature on building project quality and presented typical quality issues/defects specifically found in the building sector. These quality problems typically originate from a number of sources. Based on the comprehensive review of the literature this research has identified the sources of quality defects and categorised them under four main headings namely; technical, material/ equipment/Environment, cultural/political and stakeholder/managerial issues. The result of such classification shows that many typical quality problems originate from poor performance and management of key stakeholders.

This chapter finally underlines the gap in previous research and clarifies that although stakeholder management and involvement has been emphasised by many scholars as an important factor that affects quality, this issue has not been fully adopted or addressed in relation to examining building projects. It was found that improvement of factors associated with stakeholder/managerial defects will not only help to overcome those quality issues which directly arise from poor application of stakeholder management process, but also is a great help in improving quality defects and issues which originate from other sources.

It specifically confirms the need for integration of the two currently separated concepts of quality management and stakeholder management and the significance of paying more attention to the impacts of key project stakeholders to improve the perennial problems of poor quality, disputes and the often marred image of construction projects.

Chapter 3: An Approach to Improve Stakeholder Involvement

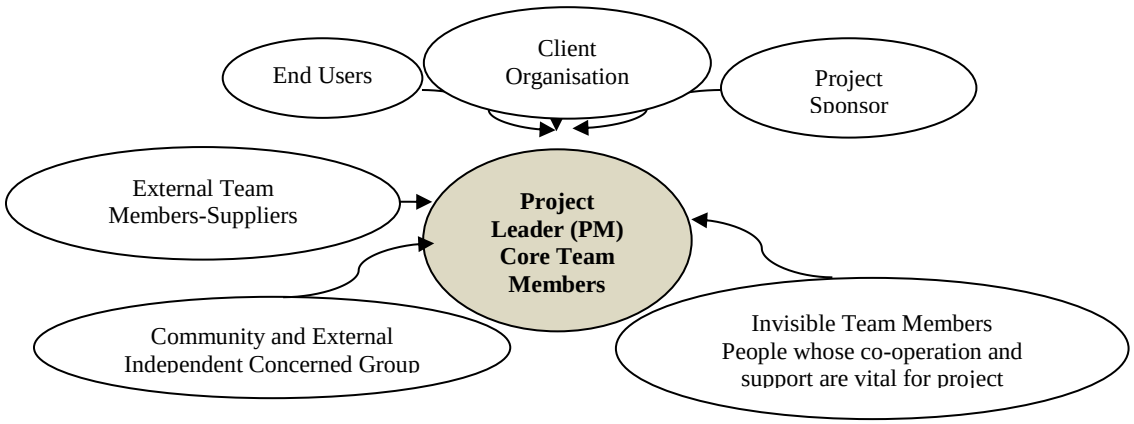
3.1 INTRODUCTION

The previous chapter reviewed the current and extant literature on quality and quality management and highlighted that improving the effectiveness of stakeholder management is a significant step to achieving better quality outcomes. This proposition reveals the need for establishing a complete understanding of the stakeholder concept and for examining the ways that stakeholder identification, management and engagement can be facilitated properly and efficiently to assist in the ultimate goal of achieving better quality project outcomes during the execution phase. Section 3.2 provides an overview of the current literature on the issue of stakeholder management in the construction industry and discusses the influences of stakeholder involvement on project outcomes generally and project quality specifically. Focusing these topics of interest more, section 3.4 focuses on the impacts stakeholder involvement in the early strategic planning and decision making phases and the high impact these have on the entire subsequent project lifecycle. This includes a review of the relative importance of the planning phase and the major components of this stage of a project. Because the final aim of this research is to improve project quality, the section focuses on the quality planning process as constituting a major driver of subsequent project quality during the this early project phase. This process is specifically designed to ensure that the outcomes delivered in execution meet the ultimate project quality requirements of the client/customer. Following this, section 3.5 proposes a framework to improve stakeholder involvement in the project and lastly, the highlights of this chapter are summarised in section 3.6.

3.2 STAKEHOLDERS IN THE CONSTRUCTION INDUSTRY

The concept of stakeholder theory was initially developed from an academic research stream being undertaken in the US in the 1960s that defined stakeholders as those groups with high enough impacts in an organisation that would cause that

organisation to stop to exist without their (the stakeholders) support (Li et al. 2013; Stoney and Winstanley 2001). Later, Freeman (1984, 52) extended this definition and described "a stakeholder in an organisation" as "any group or individual who can affect or is affected by the achievement of the organisation's objectives". The project management institute (PMI) adopted this definition and stated " A stakeholder is an individual, group, or organization who may affect, be affected by, or perceive itself to be affected by a decision, activity, or outcome of a project" (PMI 2013, p.394). The Project Management Body of Knowledge (PMBOK) notes that a project has many stakeholders whose interests may be related, or in conflict (PMI 2013). A helpful illustration by Briner (1997, 83) shown in Figure 3.1, provides a widely accepted mapping of a project's main stakeholders:



Source: (Briner, 1997)

Figure 3-1: Stakeholder Mapping

As shown in Figure 3.1, often several participants are involved in a project and a clear identification and analysis of their potential impacts on, and interest in, the project should be an essential part of a stakeholder management plan. Amongst the most important aspects of the above 'mapping' are the significance of community and external independent concerned groups, and an identification of invisible team members. It is advocated that project success can be critically affected by the activities of these two recognized groups (Briner,Hastings and Geddes 1997). The importance of stakeholders can also be determined by examining the needs of a business and the degree to which an organisation is in need of a particular stakeholder (Olander 2007; Leung et al. 2013). In certain instances, some

stakeholders can be more important than others and the project leader should carefully analyse their requirements and attributes at different times during the project life cycle. Phillip (2003) stated that stakeholder theory should focus on the groups who can input into decision making process as well as who are affected by the outputs of such decisions.

Often providing the needed resources and having the ability to control the interaction and resource flows in the network, stakeholders ultimately have strong impact on an organisation's survival. The identification and management of such stakeholders therefore becomes an essential function for any organisation in crisis. It is also argued that an organisation's advantages are basically dependant on its capability to adequately manage stakeholders (Verbeke and Tung 2013). Depending on the association between the stakeholders and the organisation, they can usually be divided in two main categories, '*internal'* and '*external'* (Olander 2006, 2007; Aaltonen and Kujala 2010) . Internal stakeholders are those actively engaged and formally connected to the project such as owners, project managers, employees. This group in many cases are directly involved in the project and have a regular and contractual collaboration with the company (Atkin and Skitmore 2008). They are sometimes referred to as primary stakeholders.

External stakeholders, on the other hand may not get directly involved in the project decision making process, but can still affect, or might be affected, by the project (Aaltonen and Kujala 2010). The term secondary stakeholder is often used as a descriptor for groups not directly connected with the company and that may not directly get involved in any financial decision making. Secondary stakeholders, however, may still have an important effect on project outcomes; hence their interests and expectations should be considered in an appropriate manner. Figure 3.2 adapted from Cleland (1999) demonstrates a schematic picture of potential internal and external stakeholders.

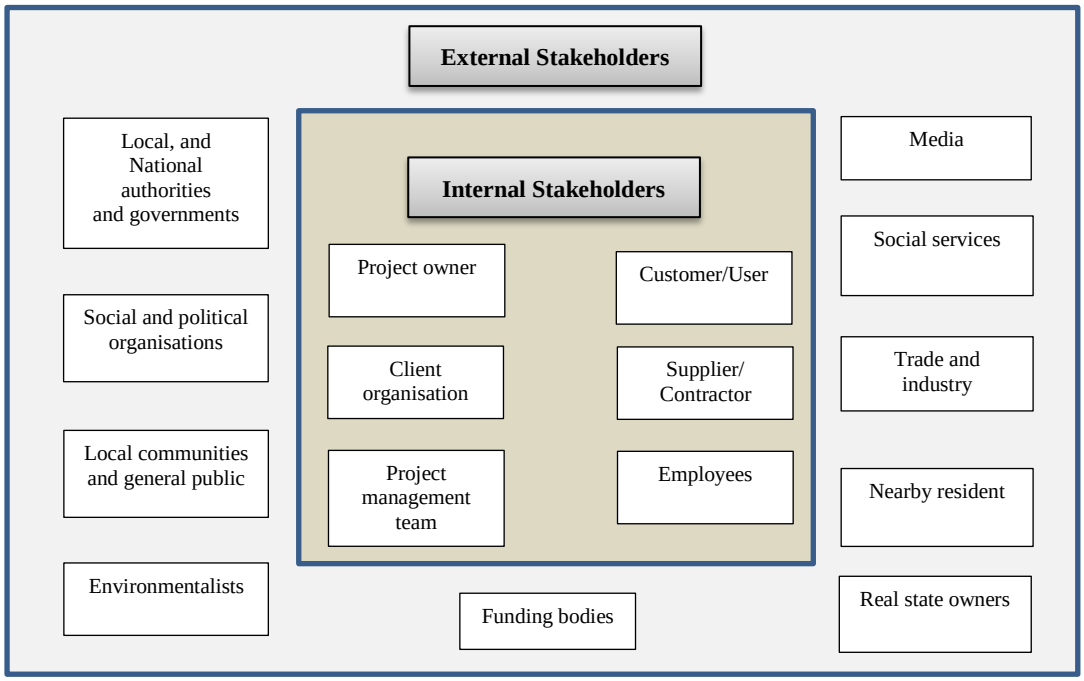


Figure 3-2: Potential stakeholders for projects(Adapted from Cleland 1999)

Stakeholder management as a task is specific to context and therefore any strategies and methods applied should reflect this context (Jones and Wicks 1999; Bourne and Walker 2005). In the construction industry, during the different stages of a project from planning through to the operation and maintenance, specific stakeholders get involved whose expectations can affect the outcomes of, or may be affected by, both negatively and positively the implementation of the project (Olander 2007). They include:

- Client
- Project Management team
- Consultant and designing team
- Contractor
- Subcontractor
- Supplier
- Employees
- Local communities
- Funding Bodies
- Government authorities

These groups as stated by many scholars (Olander and Landin 2005a; Newcombe 2003; Atkin and Skitmore 2008; Yang 2010) are the major stakeholders of construction building projects. Aktin and Skitmore (2008) signified that successful implementation and completion of the project largely relies on addressing needs and expectations of those who are involved and failure to correctly address their requirements can result in many project issues (Bourne and Walker 2005). This idea is reinforced by Johnson and Scholes (1999a) who state that it is not adequate to simply identify stakeholders, managers and owners need to evaluate each stakeholder's interest in order to articulate their expectations on project decisions. Olander (2007) advocated that it is the key responsibility of project leaders to respond to the requirements and needs raised by their stakeholders and to be able to carry out, control and manage the project decision making process. Inappropriate management and supervision of stakeholder can cause problems in the technical and management mechanism of a project. In addition, Bourne and Walker (2005) highlighted that conflicting and unseen stakeholder agendas, if not well managed, can lead to many project failures.

These issues highlight the need for having a systematic approach to identifying key project participants, examining and evaluating their needs and assessing the impact and probable risks that they can impose on the project. The next section reviews the potential impacts of different stakeholder groups on projects and on project quality.

3.3 INFLUENCES OF STAKEHOLDERS ON PROJECT

The significance of strong stakeholder management has been investigated and discussed in a number of fields including recently, construction project management, although the theoretical underpinnings of this direction of study originated from within the strategic management field (Brian and Martin 2008). According to Cleland (1995), successful implementation and completion of such projects is dependent on meeting the expectations of different groups of stakeholders including clients, project managers, designers, subcontractors, suppliers, funding bodies, users, owners, employees and local communities (Newcombe 2003). Brian and Martin (2008) and other scholars studying construction sector stakeholder issues (Bosher et al. 2007; Cole 2005; El-Gohary et al. 2006; Olander and Landin 2005b) have realized

that the activities and practices undertaken by major stakeholders have undeniable impacts on project outcomes, and identification of the important role of key members on projects has therefore developed more in recent years.

As stated by PMI (2008a) in order to obtain project success, a project manager needs to facilitate the contribution of stakeholders in various project phases. However, in the view of Joaquin et.al (2008) using the effective interaction mechanism with stakeholders to improve project outcomes and achieve success is not particularly evident in construction industry practices. Different stakeholders can be a part of a large project's executive team and depending on how they get involved and what their roles are, they might have different interests in, impacts on and ambitions for a project (Kolltveit and Grønhaug 2004). Therefore a significant part of the project management process should be to precisely evaluate the importance and influence levels of these groups and their potential orientation towards the project (Olander 2007; Winch and Bonke 2002). According to some authors (Johnson and Scholes 1999b) stakeholder analysis can be categorised into four steps of: (1) Identifying key stakeholders (2) Assessing stakeholder interest and the potential impacts of the project on these interest (3) Assessing stakeholder influence and importance and (4) Outlining a participation strategy.

Bal (2013) advocated that stakeholder analysis is a significant practice to identify and evaluate the capability and salience of key participants. A complete analysis will help to bring the most capable and salient people into the strategic and decision making process (Nguyen et al. 2009). According to Bal (2013, p.701) "those with high salience will have interest and authority to deliver sustainability related performance and might have an interest in and knowledge of different sustainability related issues and solutions as well. Those with a high salience but a negative attitude may need to be brought on board in some way through actions that lead to a change in attitude from negative to positive". A useful tool, called Power/Interest (sometimes Influence/Importance) matrix can be used to facilitate the analysis process where key questions to be answered and the results mapped are as follows (Olander 2006):

- How interested is each stakeholder group in impressing its expectations on project decisions?
- Do they mean to do so? Do they have the power to do so?

Such a matrix assists in categorising project participants based on their influence/power and their interest levels towards the project (Olander and Landin 2005a; Newcombe 2003). Figure 3.3 shows a stakeholder power/interest matrix developed by Johnson and Scholes (1999b).

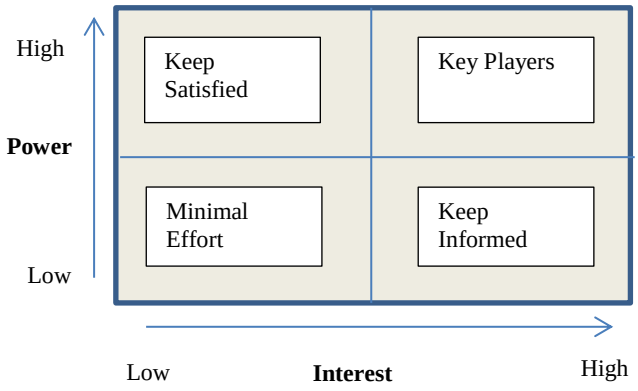


Figure 3-3: Power/Interest Matrix

It is suggested that stakeholders with high influence and high importance such as project manager and owners should be closely involved in the entire project lifecycle to increase their supports to the project (Post et al. 2002). However, when in certain situations, their involvement cannot be facilitated; it can result in serious problems such as inaccurate planning and resourcing, time and cost overruns, quality issues, confusing objectives and other similar problems (Mohammed and Abdullah 2006; Doloi 2013). Some stakeholders might have a high impact on, but low interest in, the project such as government authorities and suppliers. Although this group are maybe not the main target stakeholders of the project, yet project teams need to keep them informed and consider their views on the project in order to avoid barriers during the project planning and execution. The third group with low impacts and high interest require special consideration to make sure their needs and expectations are reasonably fulfilled. Finally the last group of stakeholders with a low level of both influence and importance are unlikely to get fully on board in the project and beyond general information sharing, require no serious involvement strategy. By mapping and grouping stakeholders on the power/interest matrix, project decision makers can create a better picture of how stakeholder's relationship impacts/has

impacted the project and its implementation process(Olander and Landin 2005a). Accurate stakeholder analysis will also help to provide project management groups with enough necessary information and strategic direction to produce a complete and effective stakeholder involvement and management plan (Elias 2012).

The influence of stakeholders is not only limited to the quality outcomes of a project. Attributes such as improper site management and monitoring (Pheng and Wee 2001), lack of on-time decision making and client-initiated variations, have reportedly been some of the most important causes of cost over runs in construction projects (Trost and Oberlender 2003). According to Frimpong (2003) these factors largely relate to the project manager, assuming that project management (PM) involves managing resources such as employees, equipment, budget, materials and methods during the planning and execution phases of the project. However, an accurate understanding of these factors and protocols of responsibility sharing for operational management among the key stakeholders is not widespread (Doloi 2013). The tools and techniques utilised to control these elements are perceived to play an important role in effective project management; Nevertheless, understanding the main causes of these elements and the potential impacts of managing (or not managing) them from the viewpoints of clients, contractors and other major parties is the key to achieving success in project performance (Doloi 2013).

It is noted that, stakeholders and projects have a bilateral impact function that means while stakeholders can influence projects; a construction project can sometimes affect stakeholders. For example, providing a higher quality of life by increasing the quality of facilities of the final project are the advantages of implementing a project. On the other hand, destruction of the environment is an example of the negative impacts of a project on some stakeholders (Olander and Landin 2005a; Olander 2002).

Different stakeholders have various demands and while a project can affect one stakeholder group negatively, it can be of positive or even critical use to another. According to Watson (2002) if major stakeholders understand each other's point of view, it can help to build and improve relationships, hence minimising the establishment of immovable and rigid ideas and assumptions and this in turn will help to facilitate better communication amongst them.

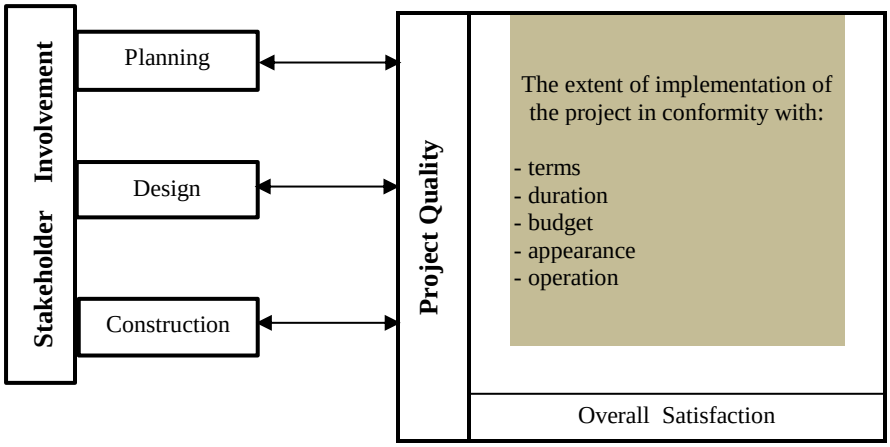
3.4 RELATIONSHIP BETWEEN STAKEHOLDER INVOLVEMENT IN PLC AND PROJECT QUALITY

Many factors can influence the quality of a project. Nevertheless, the apparent role of key stakeholders as an important factor in determining quality levels hadn't not been widely examined (Pheng and Wei 1996; Soetanto et al. 2001; Olander 2006; Wang and Huang 2006; Joaquin,Hernandez and Aspinwall 2010). According to Pheng and Wei (1996), quality of a construction project is largely dependent on the attitudes of different stakeholders including contractors and consultants. Hence, if major parties of the contract are not committed to properly carrying out their responsibilities, this would adversely affect the final project quality level. Deming (1986) declares that the customer's (stakeholder's) perspective of quality levels is critically important and therefore inclusion of main stakeholders should be a key feature of any framework aiming to improve the quality (Joaquin,Hernandez and Aspinwall 2010). While ineffective communication between different parties has been a concern for project leaders (Basu 2013), well-organized relationships are helpful in improving construction projects in terms of optimisation of the most important factors contributing to project success such as time, cost and quality (Wang and Huang 2006) .

A project management group can improve its effectiveness and the efficiency of its control and management processes and as a result, improve project quality. This requires that they possess important information about the project and be capable enough to accurately analyse that information and outline relevant project strategies. Contractors, sub-contractors and suppliers are those who might not get engaged in very early stages of projects, however, since they provide materials, equipment and on-site labour, they can still greatly impact on the final asset quality. Pheng and Wei (1996) stated that one essential step in establishing a total quality culture is to develop a construction team of main contractors and subcontractors who commit to the quality process and create a productive quality attitude. Contractors in the competitive market with a reputation for producing constructed output of poor quality will not generally ultimately be awarded many projects. Such contractors should therefore be encouraged to improve the quality of their work in order to increase their chance of winning tenders (Arditi and Gunaydin 1997).

On the other hand, contractors with a good quality reputation are expected to deliver the project within the specified time and budget and to the desired level of quality (Aje 2012). Although the main contractor is responsible for the quality of job, subcontractors perform the greater portion of the actual on-site work. It is therefore important that client and main contractor select subcontractors who have relevant experience, a satisfactory work performance record in previous projects and a proven quality attitude that aligns their objectives with the objectives of the client (Pheng and Wei 1996; Aje 2012). Nevertheless, sometimes the subcontractors' and suppliers' objectives differ from those of the main contractor. For example, in order to save time, they may want to finish their work as fast as possible thus sacrificing the quality level (Wong and Fung 1999). Subcontractors and suppliers who want to have continual business from the general contractor should attempt to perform strictly conforming to the contractor's stated requirements.

In addition, owners (clients) and developers play an important role in the accomplishment of the desired project outcome quality levels. These groups are not only accountable for preparing clear and complete specifications, but they should also monitor and control the actual on-site work of both contractors and subcontractors (Jha and Iyer 2006). In a recent investigation on the role of quality using the perspective of the 'iron triangle of cost, time and quality' Basu (2013) highlighted that there is a strong correlation between organisational quality and criteria such as stakeholder management, project leadership and top management support. However according to Walker(2000) there is a gap in previous studies and he affirms that the implementation of quality efforts is often hindered by a lack of attention to the expectations and views of the stakeholders regarding exactly what quality means in the construction industry. Yang (2010) emphasised that there are several stakeholders whose expectations and influences must be included in the project management process. More importantly, it has been underlined that if a project's stakeholders are not satisfied with the quality of the ongoing project management, or project outcomes, the project team will as a result be required to adjust scope, time and cost in order to meet the stakeholders' requirements and expectations on quality issues. Bubshait (1994) provides a clear interaction between project quality and stakeholder involvement shown in Figure 3.4.



Source: (Adapted from Bubshait 1994)

Figure 3-4: The interaction between project quality and stakeholder involvement

This figure shows that project quality can be measured by determining the degree to which the implementation of the project is in conformity with terms (i.e., specifications), duration, budgets, aesthetics, operation, and the stakeholders' overall satisfaction with project quality. It affirms that stakeholder integration in different phases of a project lifecycle is in direct and mutual relationship with the project quality. However, the current research mainly concentrates on the planning phase of projects as the majority of the vital decisions are completed during this stage and the ultimate success of the design, construction and post construction phases highly depends on the appropriate decisions that are made during this earlier planning phase (Abdul-Kadir and Price 1995; Toakley and Marosszeky 2003). For this reason the next section overview of different phases of PLC and explores the significance of the planning phase.

3.4.1 The Significance of the Early Phases of PLC

The project lifecycle (PLC) is defined as the number of phases that provide an important structure for an appropriate project management process (ASCE 2000). According to PMI (2013) all projects consist of the four following phases:

I. Conception and Initiation
II. Definition and Planning
III. Launch and Execution
IV. Performance and Control

Wubbenhorst (1986) lists five phases, initiation, planning, realisation, operation and disposal/salvage, whereas Kartam (1997) classifies four PLC phases of concept, design, construction and operation.. Robinson (2005) has also categorised the PLC phases into five groups of planning, design, construction, operation and recycling/disposal. Despite thee slightly different classifications of PLC, all of them are similar in having a classification that includes the planning phase.

The importance of conceptualisation and planning are relatively prominent compared to other phases in the project lifecycle and they both have remarkable influence on project success (Meyer and Utterback 1995; Zwikael 2009; Globerson and Zwikael 2002). Project planning according to Meredith and Mantel (2012, p.212) is defined as the "establishment of a set of directions in sufficient detail to tell the project team exactly what must be done, when it must be done and what resources to use in order to produce the deliverables of the project successfully". In the view of Cleland (2006, p.265) project planning is " an important part of the deciding aspect of the project team's job to think about the project's future in relationship to its present in such a way that organizational resources can be allocated in a manner which best suits the project's purposes". According to Laufer and Tucker (1987) planning for corporate management can be defined as a 'predict and prepare' function that consists of estimating the company's future environment, outlining opportunities and threats, defining goals in line with the environment, and determining the best method(s) to achieve these goals. Zwikael (2009) has stated that it is the project manager who must ensure that the project is directed and performed appropriately and conforms to the satisfaction of relevant stakeholder and is also responsible for all project planning.

Nevertheless, many others believe that the planning phase is a stage where different stakeholders with diverse opinions and objectives have the highest possibility to influence the project and therefore preparation of the planning documents must be carried out in collaboration with those key project members (Aaltonen and Kujala 2010; Kolltveit and Grønhaug 2004; Zwikael 2009). A complete and accurate plan will make the monitoring, evaluating and controlling process easier, as when the plans are incomplete or unclear, and then the review of the project lifecycle tasks is significantly weakened. Dvir (2003) highlighted the fact that although planning does not necessarily result in project success, lack of planning

will almost always lead to failure. The main advantages of proper planning, according to Kerzner (2013) are:

- To eliminate or reduce uncertainty;
- To improve efficiency of the operation;
- To obtain a better understanding of project objectives; and
- To provide a basis for monitoring and controlling work

The primary outcome of the planning process is the project plan, which contains the following main elements, project overview, objectives, general approach, contractual features, schedules resources plan, team identification, quality management plan, risk analysis and evaluation methods (Meredith and Mantel 2012). The project plan should conform to the strategic objectives of the enterprise, and where suitable, with the objectives and plans of key stakeholders (Cleland and Ireland 2006). Appropriate planning requires excellent managerial and communication skills (Zwikael 2009).

Different scholars have suggested different planning process methodologies. For instance, Russell and Taylor (2003) outlined the following seven steps of planning, setting project objectives, outlining activities, establishing precedence relationships, developing a time plan, determining project completion time, comparing project schedule objectives and determining the required resources to fulfil project objectives. Kerzner (2013) states there are nine major steps of the planning phase, including, objectives, time and budget, forecast, organisation, standard, procedure and policy. In the view of Cleland (2006), operational and strategic thinking are the requirements of the project planning process, whilst innovation, creativity and the aptitude to think "prospectively", are the basics needed to shape a project plan. Comparing these to other resources, Cleland (2006)outlined the major elements of the project planning process in a more comprehensive manner shown in Table 3.1:

Table 3-1: Project Planning Elements

Project Planning Elements	***Definition***
Project mission/purpose	The central reason for the project, such as creating a product, service, or organizational process change.
Project objectives	The desired future position of the project in terms of cost, schedule, and technical performance.
Project goals	Milestones leading to the completion of the project's "work packages."
Project strategy	A plan of action with accompanying policies providing general direction on how resources will be used to accomplish project goals and objectives.
Organizational structure	The project-driven, matrix organizational structure, functions, and processes.
Project team roles	Identification, negotiation, and resolution of individual and collective authority, responsibility, and accountability.
Style	Project manager and project team member manner, knowledge, skills, and attitudes.
Systems	Combination of management and organizational functions forming an integrated entity to support project activities.
Project resources	Quality and quantity of human and nonhuman resources to support the project.

It has been demonstrated that strategic vision, mission, objectives and goals for the organisation will drive project planning in most industries (Aaltonen and Kujala 2010; Kolltveit and Grønhaug 2004). Like many other types of project, construction building projects require a thinking process and need to have distinctive strategic and tactical plans to drive successful output delivery. The conceptual and planning phases of construction projects include many activities such as planning for time, cost , quality and scope, identification and collection of stakeholder's needs and determining strategic objectives for project that will affect subsequent stages of implementation and operation (Joaquin,Hernandez and Aspinwall 2008).

In spite of the need for a specific identified planning process and the relevant corresponding elements to be in place, these is no general consensus on which of these are more important and critical (Zwikael 2009). On the other hand, project leaders and planners are often under severe time pressures and therefore are many times unable to carry out all the planning processes, thus as a result, they often select to conduct only those important parts of the planning process that can fulfil their enterprise and project objectives. Considering these statements, and because the final aim of this research is improve the delivery quality of construction projects, it mainly focuses on the topic of critical quality planning being part of the planning process

which most focuses on achieving the outcomes that can meet project and stakeholder's quality requirements.

3.4.2 Quality Planning Process

The initiation and planning phase of a project includes important activities and processes (Anderson 2009). While the final aim of a company is to improve the success of a project, each process during the planning phase, follows particular objectives. For example, although appropriate cost planning will help to achieve success in the project(Yu et al. 2006; Belout and Gauvreau 2004), it is particularly necessary to ensure that a realistic cost limit determined by factors such as availability of money and market demand is established. According to PMI (2013, p.64), "A cost estimate is needed for a contingency plan involves integration of the planning process." Similarly, quality planning is necessary to ensure that the quality objectives that meet the requirements of key stakeholders are achieved. According to Applebaum (2004) quality management and improvement should start from the beginning of the planning phase, not when the customer receives the project. One advantage of planning and beginning quality improvement practices in upfront phases of any project is that higher quality 'planned-in' early in the project front-end development work will ensure fewer issues and defects are created in the later stages of the process, hence resulting in better quality delivery (Leszaka et al. 2002).

Many organisations currently concentrate their efforts on quality improvement programmes (Senaratne and Jayarathna 2012), nonetheless, the literature shows that these programmes are not generating the expected quality improvements (Lam 1997). This is possibly due to a key reason stated by Juran (1999), that is the absence of an effective quality planning process before implementing quality practices. Hence, time and again the extant and current literature are telling us that quality planning is the most important phase in a business quality management process and thus requires more investigation and consideration (Senaratne and Jayarathna 2012). Quality planning is a disciplined process designed to make sure that the structured set of quality assurance and control activities is complete. These activities will ensure that an organisation can implement a high quality project on time and to the satisfaction of customers and stakeholder's needs and specifications (Juran and Godfery 1999).

Many scholars have developed planning methodologies (Rakich 2000; Lam 1997), but this current research study for the following reasons, focuses on the *quality planning process model* originally introduced by Juran (1999) and supplemented and amended by PMI (2013).

- It is a generic model and hence can be used for the planning of construction building projects
- It focuses on project planning;
- It is widely used for different industries including the construction sector and has been found to be reliable

According to PMI (2013), the quality planning process should be performed in parallel with the other planning processes. Juran (1999) classified quality planning and its associated methods as being something which would help organisations to bridge large 'quality gaps' and improve instances of consistent failure to develop projects or products that delighted customers. Juran and De Feo (2010) adapted the classification presented by Parasuraman (1985) and categorised quality gaps into five main clusters shown in Figure 3.5.

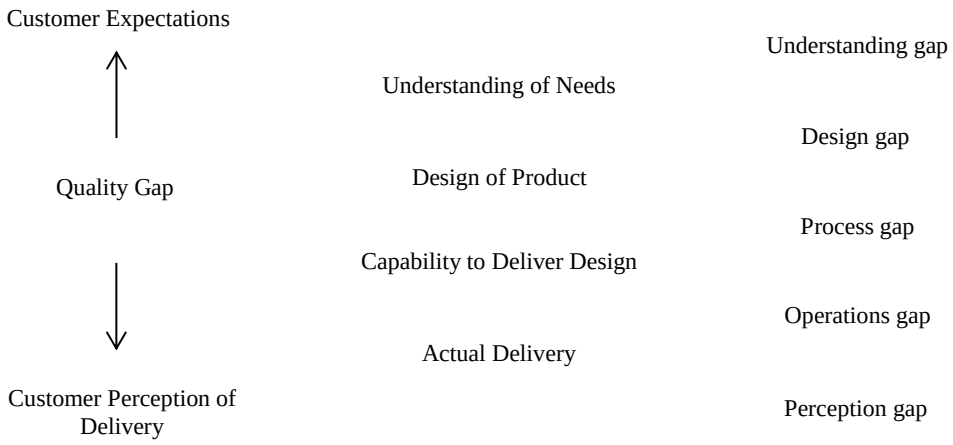


Figure 3-5: The quality gap and its constituent gap

The first cluster is the "understanding gaps", which is related to a lack of understanding and in fully examining customer's needs and demands. The final "perception gap" results similarly from a failure to identify and understand customers' needs and expectations. Sometimes even though customers and stakeholders are identified and there is an adequate level of knowledge about their needs and requirements, many organisations fail to design a project or products that

are entirely consistent with that information. This is called the "design gap" the second component. The third component of quality gaps is called "process gap". Lack of process capability to produce and deliver a project, or product, which conforms to design specifications, is one of the most persistent problems in increasing the total quality gap. In addition, the means, by which the whole process is operated, monitored and controlled, in certain cases, may create additional failures in the delivery of the final project or services and this is called "operations gap". Quality planning is the process (including using the various tools and techniques) to minimise each of these component gaps and therefore ensure that final quality gap is at minimum level. Juran's (1999) grouping of quality planning which is used in this research has been applied to a number of fields of study including the construction sector. He grouped the main steps of quality planning into six clusters that are illustrated below in Figure3.6.

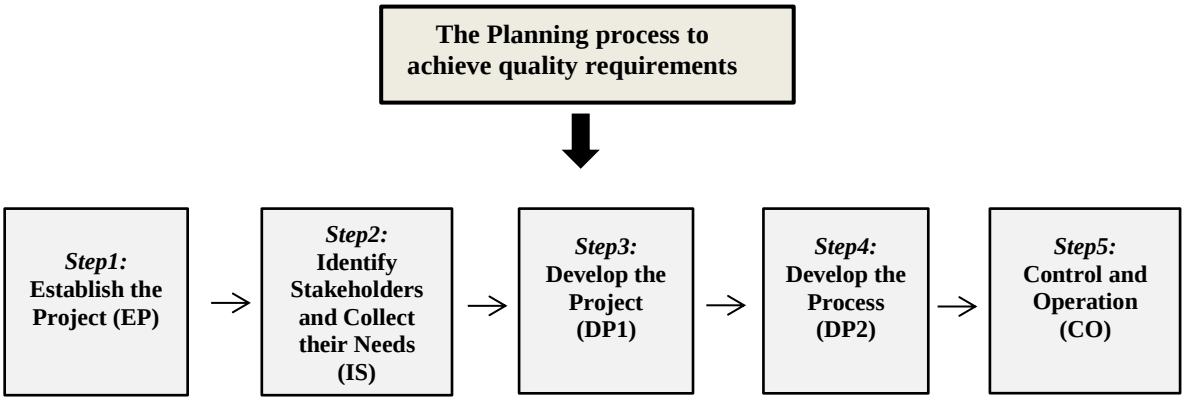


Figure 3-6: The planning process phases to achieve quality requirements

In the quality planning process, the purpose of the first step (EP) is to provide clear goals and correct directions of the project. Some of the major tasks of this step include: identify the projects to fulfil the organisation's strategy, clarify the mission of each project, allocate project team members and prepare a complete project plan. The next step (IS) provides a systematic identification and complete understanding of all project stakeholders and their needs, expectations and requirements. By identifying customers and explicitly assessing their expectations, the understating and perception gaps can be avoided.

The specific project/product, quality planning tools, techniques and technology for the industry are required to be applied to produce an effective design, conforming

fully to stakeholders needs. Identifying and implementing the activities that result in delivering the final project that conforms to such requirements and without deficiencies are main purposes of step 3 (DP1) (Juran and Godfery 1999). Step 4 (DP4) ensures that the whole process and its elements are made capable enough to deliver the project as it was planned and designed. It also monitors that the process is consistent with project strategic objectives. Lastly, the operation gap can be closed by developing and efficiently transferring the plans over to the operational forces.

As stated by PMI (2008b) one of the important outputs of quality planning process is the quality management plan, which defines how the project management team should implement the performing company's quality policy. It is a useful tool to document the information required to successfully manage project quality from the early stages to the delivery phases. PMI (2013) also stresses that a key consideration to be borne in mind is that project planning and quality planning should not be treated as separate processes since they include many similar activities that interact with each other as well as with other processes of the planning phase.

3.5 EFFECTIVE STAKEHOLDER INVOLVEMENT: *IMPROVEMENT IDEA*

Many people and groups are involved in the provision and delivery of construction projects and each has their own role, requirements and objectives. To meet the differing demands of different stakeholder groups, and in order to increase the effectiveness and efficiency of the decisions that are made during the construction project lifecycle, project managers have to develop a stakeholder involvement plan (Saghatforoush et al. 2010). Project researches in the construction sector (Bosher et al. 2007; Bal et al. 2013; Olander and Landin 2005a) highlight that stakeholder involvement is important to project outcomes (Yang 2010). An organised stakeholder involvement plan helps project stakeholder to efficiently collaborate with each other to decrease negative environmental impacts and increase the economic sustainability and quality of the project. Bal (2013) advocated that project can achieve a long term success, if it brings into consideration the expectations and requirements of the stakeholders and endeavours to fulfil their needs.

Post (2002) clarifies that the power of stakeholders emanates from their capability to change or limit organisational resources, as well as their ability to control or intensify social and political forces. For instance, project managers are generally regarded as having a critical role in managing the project and therefore they should exhibit high quality managerial attributes (Hwang and Lim 2013). Stakeholders are involved in delivering different levels of impact and may have very different interests, which may result in conflict among them (Leung,Yu and Liang 2013). To manage this conflict the project management team needs to take into account all stakeholder needs and their relative impacts on the project decision making process (Moura and Teixeura 2010). Total stakeholder involvement along with other factors such as leadership, measurement and improvement, teamwork and process approach are considered as the key factors that influence the successful implementation of total quality management systems. (Tang et al. 2009b). Achterkamp and Vos (2008) reported that the main purpose of involving stakeholder conception in the industry is to give meaning to a project's success. Nevertheless, in the view of the project management team, limiting the involvement of some stakeholder groups, particularly opposing parties, will speed up completion of the project go-decision (Aaltonen and Kujala 2010).

Stakeholders of construction projects are numerous and different and this introduces a level of complexity to the concept of stakeholder involvement within the industry (Bal et al. 2013). However, depending on the type of the project and its specific requirements, only certain groups may actually get involved in the process. According to Walker (2000), in order to successfully involve these groups in the project and to ensure that sensible perspectives of quality are obtained from major stakeholders. It is also necessary to analyse their characteristics and classify them based on their power and interest levels (Aaltonen and Kujala 2010). The fundamental logic here is that by involving different parties, that have dissimilar preferences and objectives, in the project planning process, conflicts to plans and other threats to action in the implementation and operations phase are minimized.

Furthermore, ability to impact the final project characteristics is at the highest level at the beginning of the project and it reduces as the project progresses. The significance of active stakeholder management efforts in the early phases of the project has been recognised and emphasised (Kolltveit and Grønhaug 2004). It is

widely advocated in the project management and infrastructure project literature (IFC 2007) that the project preparation and planning phase is the stage where different stakeholders with different demands and objectives have the highest possibility to affect project and its outcomes (Kolltveit and Grønhaug 2004; Miller and Lessard 2001). According to Griffith and Sidwell (1997) the planning phase, among various phases of construction project lifecycle, has the highest ability to influence the total project cost. In addition, major decisions related to a project are made during the planning and design phases and taking into account stakeholder's claims and requirements would be very difficult once theses phases are complete (Miller and Olleros 2001). Moreover, the construction and operation stages signify the final steps of construction and procurement process; however they are the outputs of previous stages of conceptual, planning and design (Toakley and Marosszeky 2003).

Arditi and Gunaydin (1997) substantiate that generating the project requirements for quality begins at project planning. According to Leszaka (2002) attaining of a higher quality in the early stages of a project results in fewer being found and needing to be repaired in the later parts of the process. As stated by Kolltveit (2004) the potential impacts of key stakeholders, especially external stakeholders, is maximum in the initial and planning phases, i.e., before the final detailed agenda in developed and whilst the cost of change is still at a minimum level. This signifies that the opening stages of a project are the most appropriate time for innovative activities and planning for project implementation to enhance project value. Figure 3.7 demonstrates the impacts of these variables based on the project time.

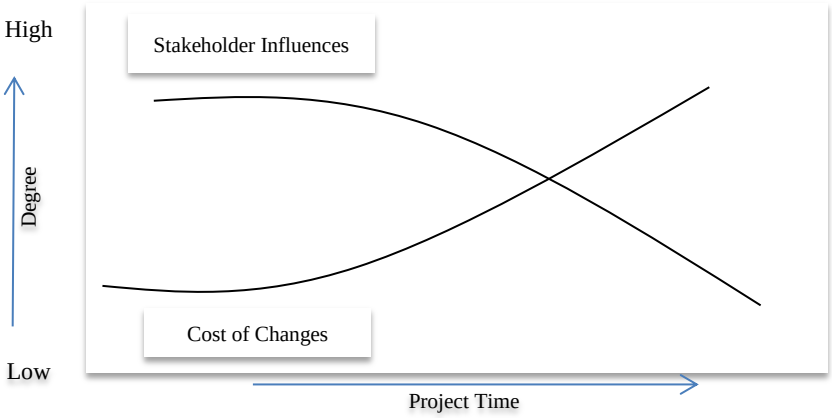


Figure 3-7: Trend of stakeholder impact and cost of change over time

Stakeholders are responsible for the majority of project quality issues. Poor coordination and communication among key project groups, lack of knowledge and skills, low effectiveness of project management systems, lack of a strong quality culture and delays in making project decisions, are all examples of quality problems and result from ineffective management and involvement of stakeholders (Jha and Iyer 2006; Yang 2010). For these reasons, organisations need to adopt a stakeholder involvement plan in order to provide an opportunity to establish alignment between structures and processes to support the organisation's vision and mission. Effective and efficient involvement of project participants will better assist in improving the total quality of a constructed project and will significantly leads to greater project value (Kolltveit and Grønhaug 2004).

However, despite the fact that there has been wide discussion in the literature regarding the significance of early phases and how important decisions made by key parties in this phase may dramatically influence project (Kolltveit and Grønhaug 2004; Zwikael 2009; Dvir,Raz and Shenhar 2003), no major studies have focused on improving the involvement of stakeholders in the project through a more effective decision-making process in the strategic stage of project planning, with the aim of improving construction quality delivery.

This research gap was a major trigger in identifying this research and highlighted the need to develop a more comprehensive framework for effective stakeholder involvement in construction projects. Correct implementation of this framework will undoubtedly help to improve the handling and management of many longstanding and current quality issues found in residential building projects.

3.6 SUMMARY

Good quality management and full stakeholder involvement are clearly regarded by many authors and researchers as two major success factors in construction projects. The first chapter of the two-chapter literature review stated the gap in the field of quality management and proposed a need for greater management of project participants during the PLC. It highlighted that many quality issues are the result of inappropriate performance and management of project stakeholders.

This second chapter of the literature review opened with the identification of stakeholders in the construction industry's projects and examined their influences on project and project quality. Findings from this section affirmed that stakeholders have an undeniable impact on quality outcomes and their effective involvement in the PLC can assist in improving the majority of quality issues. The planning and decision making phases of PLC were identified as being relatively important compared to other phases and were found to have a remarkable influence on project success. Stakeholder influence is at the highest level, and the cost of change at the lowest, level, in the beginning stages of a project. Investigation of these issues provides the foundation for the main aims of this research, to investigate how to improve effective stakeholder involvement by making the best decisions in the project planning phases and examine how such involvement can improve the final project quality. Developing a framework will fulfil the major objective of the research.

Chapter 4: Research Design Methodology

4.1 INTRODUCTION

It is undeniable from reviewing the extant and current literature that the concepts of quality management and stakeholder management are critical within construction projects. Although efforts have been made to enhance both over the years, the construction industry is still suffering from low levels of quality, miscommunication and disputes in the building project sector. One of the main reasons for these deficits is, as highlighted in the previous chapters, the lack of effective involvement of project participants in the project due to the application of incomplete, or inappropriate, decision-making strategies. It has also been revealed that a better contribution of stakeholders is beneficial in solving many of the main quality defects in the building sector. However, no major studies to date have considered this issue comprehensively.

This section of the report explains the design and the methods applied in this research for discovering how best to involve stakeholders in projects to improve quality project outcomes. The research problem and questions are reiterated in section 4.3 to support the explanation of the methodology. The research methods applied are fully described in section 4.4. Section 4.5 provides an overall framework for the end deliverable of the study namely the Effective Stakeholder Involvement (ESI) framework. Data analysis techniques that comprise a choice of qualitative and quantitative enquiry approaches are outlined in section 4.6 followed by a clarification of verification and validation techniques in section 4.7. Section 4.8 summaries this chapter.

4.2 THE RESEARCH PARADIGM

Before attempting to undertake any research, it is necessary to review the different philosophical approaches. Understanding and selecting the appropriate approach can significantly help to choose accurate strategies and methodologies (Saunders et al. 2009). According to Sarandakos (1998a) the philosophical framework is the driving power behind achieving the aims of a research project.

Such a framework assists in developing the research plan using matched techniques and methods, as well as setting the overall perception of social and reality relations in the research. It is therefore necessary to consider certain assumptions about the preparation of a research approach, before choosing a specific method. Hirshheim (1989) labelled these assumptions as forming a 'paradigm'.

The three paradigms of "positivism", "interpretive", and "critical" can be applied depending on the objectives of each research study (Sarantakos 1998a; Neuman 2006). The "positivist paradigm" assumes that the existence reality is driven by natural laws and that the social world is independent of humans, is objective and rests on order. In the view of positivists, human beings are individuals directed by laws. Too (2009, P.89) explains that in this approach " science is based on adherence to strict rules and procedures. Science is deductive and based on universal laws that explain concrete social event and relationships". So the positivist approach sees research as being logical in nature with questions (expressed as hypotheses) requiring empirical testing. On the other hand, the "interpretivist paradigm" assumes that reality is in the minds of humans, and is undertaken through examining the common relationships and interpretations. So in this approach people are the centre of any reality (Too 2009). Interpretive researchers attempt to investigate the meanings and implications of their interpretations by examining and involving people's ideas. This paradigm assumes that science requires a comparative approach and discusses that the fundamentals to explain social science are made applicable through understanding people, their approaches and their perspectives. Finally, the "critical paradigm" accepts that any reality is created by people, particularly, those who have the power to convince others to perceive things the way they want them to. In this view, although people can potentially generate and adjust things, yet they are actually limited by other elements and especially by those more influential individuals in their society. In summary then, this latter paradigm focuses on eliminating incorrect ideas about the group of people (or the systems), who (that) have more power than others and control human beings in different societies.

This research aims to expand the involvement of stakeholders in order to improve the quality of final project. Firstly, it aims to confirm that the many of quality issues are the result of poor management and performance of participants and secondly it explores the best possible practices during the planning process in order

to identify those factors that will promote and support better engagement of key stakeholders during the Project Life Cycle (PLC). Both positivist and interpretivist approaches were adopted in this research based on two underlying logics; the first part of this research focuses on the collection and analysis of the data in form of numbers. A positivist approach was used in this part since the data collected are quantitative and objective. In the second (that is the major) part of the data collection, several interviews were conducted in order to obtain insights and explanations of the capabilities needed for organisations to manage stakeholder involvement. This portion of the research aims to examine how the targeted research population make sense of their own reality and this is the focal point of an interpretive paradigm, so therefore it follows that a more interpretivist paradigm was applied in the second stage of the data analysis.

4.3 A REVIEW OF THE RESEARCH QUESTIONS

As discussed in previous sections of this thesis, despite the fact that the building construction sector has implemented some well-recognized quality management practices, it is still encountering a large number of quality problems and as a result, relatively low quality of final project outcomes.

There are a significant number of studies into the introduction and development of quality practices and stakeholder management in the construction industry (Arditi and Gunaydin 1997; Elghamrawy and Shibayama 2008; Yang 2010; Brian and Martin 2008; Olander and Landin 2005a). However, no major research studies have yet been conducted on how stakeholders' perspectives on quality can be better used to contribute to quality management plans and practices to ensure the ultimate improvement of the quality of project outcomes (Walker 2000). Therefore, in order to successfully involve stakeholders in the project and particularly in the planning process and to achieve higher quality outcomes in construction building projects, a number of questions need to be answered. These questions include:

I. What is the current level of stakeholder involvement in the planning process of construction projects?

II. To what extent stakeholder involvement can improve construction project quality issues?

III. How can stakeholder involvement be strengthened and structured to assist construction companies in achieving higher project quality outcomes?

4.4 SELECTION OF THE RESEARCH METHODOLOGY

The careful selection of appropriate methods and strategies are important parts of any research (Naoum 2007). According to Abowitz and Toole (2010) it is critical to realise the most appropriate research methodology to develop an effective data collection process specifically in the construction industry. In addition, the objectives of the research can be achieved by using the most suitable methods and the selection of the methodology employed is dependent on the nature, features and context of the research (Jaapar et al. 2009). The methods employed in conducting this research were selected to support each of the research questions.

This research adopted a mix-methods approach since according to some authors, collecting data from different sources with multiple of techniques provides consistency and can potentially lessen probable bias that is related to some data collection strategies (Sekaran and Bougie 2009). Compared with applying a single method approach, there is an added-value to the results when a mixed method approach in adopted. The combined techniques can also potentially escalate the validity of results and generate knowledge through the study of alternative designs (Hurmerinta-Peltomaki and Nummela 2006). Two methodologies and methods were used to collect all the required data, a survey by means of questionnaire and case studies by means of interviews. The process of operationalizing each method and the analysis techniques subsequently applied are fully explained at the beginning of each of the results chapters (chapter 5, section5.2, and chapter 6, sections 6.2 and 6.3).

According to Yin (2009a), three factors need to be considered when selecting a research method:

- The type of research question being asked;
- The control a researcher has over actual behavioural events; and
- The degree of focus on contemporary as opposed to historical events.

The first and second research questions are ‘what’ type of questions that measure the prevalence of people’s attitudes. As stated by Yin (2009a), these type of questions have an exploratory purpose and require the use of a method such as a

survey, and so this method was used in this study to answer these questions. The third question is a 'how' type of question. This type of question has a descriptive purpose and can be responded to by the use of a case study approach, because the questions being posed deal with operational links that need to be traced over time, rather than mere frequencies or incidences of beliefs.

Table 4.1 presents an integrated view of the chosen methods and relates them to each of the research questions and objectives; the details of each method are explained in the following subsections.

Table 4-1: Selection of Research Methods

Research Questions	***Research objectives***	***Selected Methods***	***Data Collection***
What is the current level of stakeholder involvement in the planning processes of construction projects?	To evaluate the extent of current stakeholder involvement in the planning process of construction building projects.	*Survey*	*Questionnaire*
To what extent can effective stakeholder involvement improve construction project quality issues?	To recognize the impact of effective stakeholder involvement in improving the problems that construction building projects have with quality.	*Survey*	*Questionnaire*
How can stakeholder involvement be strengthened and improved to assist construction companies achieve higher project quality outcomes?	To develop a framework to improve effective stakeholder involvement in the project by the enhanced decision making strategies during planning process in order to achieve better quality outcomes	*Case Study*	*Interviews*

Prior to describe each method, it is necessary to provide the rationale for the selection of the methods (Evan 1995). For this reason, the following sections (4.4.1 &4.4.2) provide explanations and justifications for the proposed methods and techniques for data collection.

4.4.1 The Rationale for Using a Survey

Survey is considered as one of the most significant research methods in many different enquiry fields (Kalantari et al. 2011) including construction and project management (Masrom 2012; Willar 2012). A survey is a system for collecting

suitable information from a group of people to illustrate, compare or evaluate their knowledge, attitudes, and behaviour (Fink 2008).

Two main characteristics describe the purposes of a survey. Firstly, surveys aim to produce some descriptions about the distribution of phenomena in a population (Pinsonneault and Kraemer 1993; Ling et al. 2008). Therefore, a survey analysis may be concerned with comparing the relationship between variables, or with demonstrating the finding, descriptively (Zikmund et al. 2000). Secondly, surveys are used to collect information from research population through structured questions. As stated by Pinsonneault & Kraemer (1993, 80), "the purpose of survey research in description is to find out what situations, events, attitudes, or opinions are occurring in a population". A survey provides a means for collection of a large amount of data from a substantial population in a highly economical way and it also operates on a foundation of statistical sampling to protect a particular representative dataset (Fellows and Liu 2008).

This research has used a survey and questionnaire in the first round of data collection. The next section clarifies the use of the questionnaire.

Questionnaire

As stated by Fellows and Liu (2008), the main objective of a survey is to achieve statistical validity. Most often, it is proposed that the survey be conducted by means of a questionnaire with the aim of collecting valid, consistent, impartial and discriminatory data from a representative sample of respondents. Questionnaire surveys are regarded as the most appropriate method for accessing a large heterogeneous number of respondents at a reasonably low cost. According to Wood (1999), increasing the number of issues used in a questionnaire survey can help in presenting a better sample basis. According to Fellows and Liu (2008) other advantages to be derived from the use of a questionnaire include:

- Generally inexpensive to conduct
- Generally easy to interpret both quantitatively and qualitatively
- Can be distributed broadly
- Can accommodate a huge research population

- Easy for respondents to answer

Survey objectives are varied and closely relate to the objectives of the research (Fink 2010). The purpose of this research is to develop a framework to enhance the effective stakeholder involvement during construction projects, by applying the best decision making strategies in the planning process. It is, therefore, necessary to first determine the current levels of stakeholder involvement in the planning since according to Yin and Heald (1975), it is essential to evaluate an existing provision within the main research area before establishing a framework.

This research, therefore, used a questionnaire-based survey to facilitate the answering of the following research questions:

> ***Q1: What is the current level of stakeholder involvement in the planning process of construction building projects?***
> ***Q2: To what extent can effective stakeholder involvement improve construction project quality issues?***

4.4.2 The Rationale for Using a Case Study

The term "case study" has various implications. It can be applied to illustrate a unit of analysis or to explain the research method (Too 2009). Case studies can be employed for different purposes, for example, building and testing theories and obtaining clarifications (Eisenhardt and Graebner 2007). Case studies involve the examination of a phenomenon in its natural setting and have been considered as the most appropriate method to use when the researcher is endeavouring to identify the relationship that exists between context and the phenomenon of interest (Amoroso et al. 1989). The case study approach typically encompasses a set of methods which constitute a qualitative analysis (Gable 1994). It offers a deep understanding of the identified problem and according to Gable (1994), it provides the opportunity to ask insightful questions and to obtain the broad perceptive of organisational behaviour. However, the eventual results may be specific to the particular organisations under study and possibly cannot be generalised. According to Payne and Judy (2004) the case study approach also offers a number of additional benefits including:

- Researchers can generate theories from practice
- It allows recognition of the nature of problems and the difficulty of the process happening
- It gives a worthwhile insight into new subjects

As identified by Yin (2009a), there are six sources of data collection in case study research including, interviews, documentation, archival records, physical artefacts, direct observation and participant observation. Depending on the specific case criteria, each of these sources has its own advantages. Yin (2009a) declared that the power in case study data collection is the possibility to use various sources of evidence. Based on the above considerations, this research applied the case study method by conducting in-depth interviews as the main source of evidence.

Interview

There are particular reasons to select interviews as part a data collection technique. An interview is an interactional event where questions are a central part of the data (Yin 2009a). Studying quality improvement through the involvement of stakeholders during the project planning phase, acquiring information about the project participant's knowledge, experience and their perspective on the issue, becomes significant to support the answering of the research questions. To obtain such information, an interview seems to be very beneficial since it allows the researcher to interact with the interview population and provides an insight about their behaviour, views, approaches and feelings (Patton 2002a). Yin (2009a) also stresses that interviews are crucial sources of case study information.

Interviews are classified into three main categories, namely, structured, semi-structured and unstructured (Fellows and Liu 2008). The selection of the interview approach for this research is mostly influenced by the nature of research questions and the objectives to be achieved, than solely due to the use of the case study. According to Burns (1997), a semi-structured interview will enhance the relationship between the interviewee and the researcher and let the interviewees freely express their perspectives. It also uses natural language to present to the interviewees rather than forcing them to understand and fit into the concepts of the study. Yin (2009b) has also argued that interviews may be modified towards formal survey research and

he has identified and classified two forms of interview, in-depth and focus. The selection of the interview approach for this research is more influenced by the research questions and objectives set to be achieved than by use of the case study.

In-depth interviews were used in this study to examine the precise role of stakeholders in planning projects as well as proposing approaches for more actual involvement of stakeholders in order to improve quality problems. It will ultimately help to address the third research question:

> ***Q3: How can stakeholder involvement be strengthened and improved to assist construction companies achieve higher project quality outcomes?***

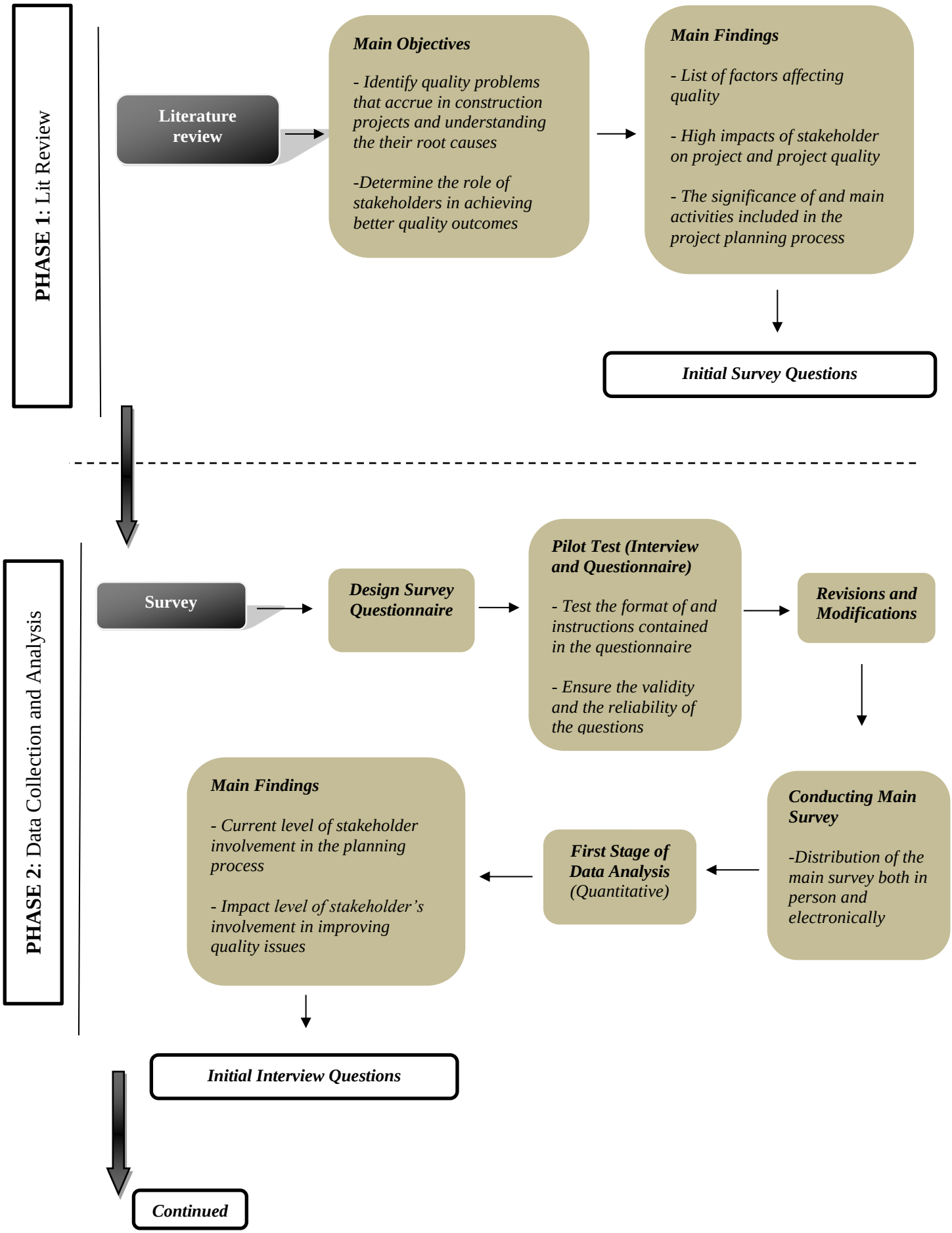
The Use of Multiple Data-Points within the Case Study

According to Bazely (2007) and Eisenhardt (2007) collecting data and formulating theories from multiple sources results in more valid, testable and reliable outcomes. In order to strengthen the research and create theoretical constructs, the use of multiple cases is highly recommended (Eisenhardt 1989). Even though one case can provide a rich explanation of a phenomenon (Sigglekow 2007), involving multiple respondents from different cases provides more powerful basis for the analysis and theory building process (Yin 2003). Collecting data from multiple cases facilitates some comparisons and prevent theories from emerging that might be idiosyncratic to a single case. Since the main purpose of case studies in the present study is to generate theories and not test them, there is no necessity to choose representative for each case (Eisenhardt and Graebner 2007). Therefore, multiple sources were used in this research to collect the required data to develop an effective stakeholder involvement framework. Accordingly, the final framework will thus be inclusive and testable.

4.5 RESEARCH STEPS

The previous section explained and justified the selection of a survey and case studies as the main methods for data collection. This section, aims to elaborate how this research has actually been operationalized using three phases. These phases are (1) literature review, (2) data collection and (3) framework development. The

research process is shown in Figure 4.1. The detailed design process and findings of each phase have been fully explained in the related chapter.


PHASE 1: Lit Review
Literature review
Main Objectives
- Identify quality problems that accrue in construction projects and understanding the their root causes
-Determine the role of stakeholders in achieving better quality outcomes
Main Findings
- List of factors affecting quality
- High impacts of stakeholder on project and project quality
- The significance of and main activities included in the project planning process
Initial Survey Questions
PHASE 2: Data Collection and Analysis
Survey
Design Survey Questionnaire
Pilot Test (Interview and Questionnaire)
- Test the format of and instructions contained in the questionnaire
- Ensure the validity and the reliability of the questions
Revisions and Modifications
Conducting Main Survey
-Distribution of the main survey both in person and electronically
First Stage of Data Analysis (Quantitative)
Main Findings
- Current level of stakeholder involvement in the planning process
- Impact level of stakeholder's involvement in improving quality issues
Initial Interview Questions
Continued

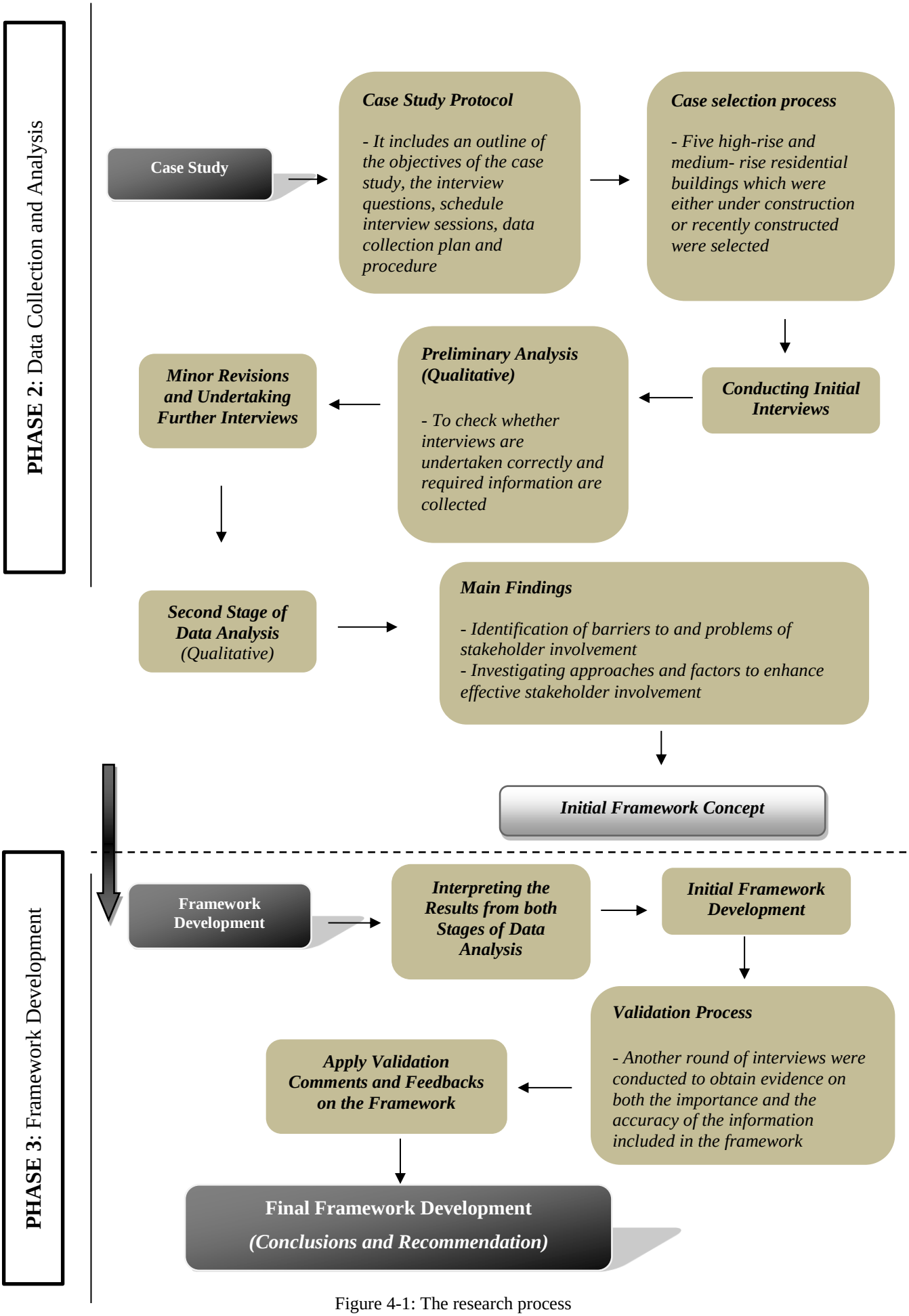


Figure 4-1: The research process

4.6 DATA ANALYSIS APPROACH

Through analysis of collected data is highly important since successful theory building and framework development largely depends on the results of analysis. Yin (2003) explains that data analysis is the process of investigating, grouping, testing and linking different qualitative and/or quantitative information to address research questions. Although statistical analysis methods are relatively well studied, the discussion of the purposes and establishment of conditions relating to, qualitative approaches has not so far been so adequately been developed (Yin 2009a). Nevertheless, for any kind of data, it is important to conduct the analysis by exploring the raw data to search for patterns. According to O'leary (2004), there are a number of steps in the process of data analysis:

- Managing and organising raw data
- Coding and entering data systematically
- Engaging in reflective analysis suitable for the types of collected data
- Appropriate interpretation
- Uncovering and discovering findings
- Structuring a relevant and appropriate conclusion

To address the questions of the present study, both qualitative and quantitative attributes were applied. Using qualitative and quantitative methods together will increase the precision of case selection and consequently contribute both to save resources and to strengthen the validity of results (Adams et al. 2007).

Quantitative Analysis Approach

The data collected from questionnaire were analysed using a popular statistical analysis software, the Statistical Package for Social Science (SPSS) version 19.0 (2010). To ensure the consistency of the quantitative data and to make the interpretation of results more meaningful, several initial processes were undertaken. These processes include categorizing data, editing data, coding data and creating data files. Details of the quantitative statistical analysis are explained in the next chapter, sections 5.4 and 5.5.

The quantitative approach includes both examining the general trends in the data as well as fitting statistical models to the data (Field 2009). Descriptive statistical analysis, particularly the measurement of central tendency (mean, median), and the measurement of variation (standard deviation) was undertaken for the following reasons:

- To profile the respondents in terms of position, work experience and the types of projects in which they were involved
- To depict the current level of stakeholder involvement in different phases of the planning process
- To examine the impact of stakeholder involvement in improving levels of quality issues.

The required results to answer the first and second research questions were achieved through a comprehensive descriptive analysis; however, in order to strengthen the examination a second round of analysis was commenced. In the second category of statistical analysis, a parametric analysis of variance (ANOVA) test was conducted to statistically test whether organisational roles have influence on stakeholder involvement levels. In using parametric tests the three main conditions of data were considered (Bryman and Cramer 2009). These being: (a) scale of measurement is interval (b) data are normally distributed and (c) the assumption of homogeneity of variance is not violated. However, after testing the normality, some parts of data were found to possess a non-normal distribution. For this reason, and to make sure the results are accurate and correct, a non-parametric test (Kruskal-Wallis) was also conducted which gave similar results to the parametric tests.

Qualitative Analysis Approach

Conducting qualitative analysis enhances the value of a research design and provides insight into the meaning of particular fixed responses. Qualitative analysis was employed in this research to analyse data from the case studies. The collected data from interviews were analysed using QSR NVIVO (2010) Version 9 qualitative data analysis software. Established techniques for managing qualitative data include noding, case creating and coding. “The purpose of coding texts is to get access to the main ideas and assess what is going on in the collected data” (Saghatforoush et al.

2013, P 66). Such a process also allows unstructured data to be converted into ideas (Richards and Morse 2007).

The coding process moves in a stepwise style and organizes unsorted data to more advanced categories, themes, and concepts (Hahn 2008). Coding usually uses three or four steps; however the number of steps depends on research objectives, methods and the amount of raw data. Figure 4.2 shows the four common steps of coding.

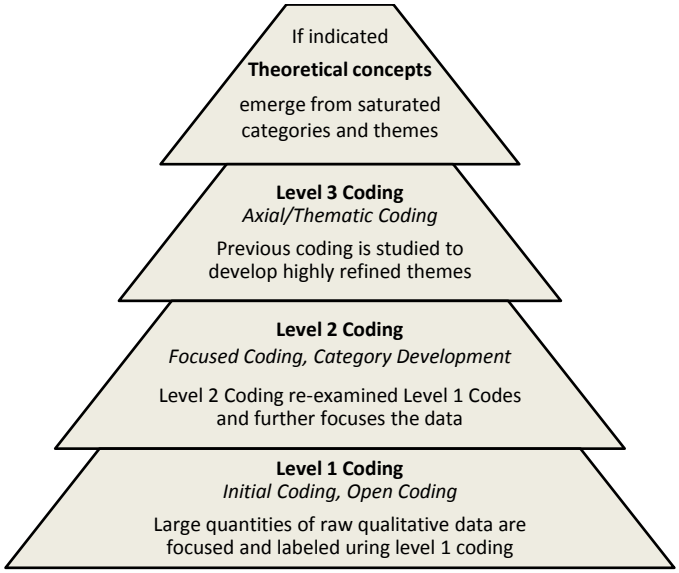


Figure 4-2: Qualitative coding levels (adapted from (Hahn 2008))

For this research, two levels of coding were used. In level one, the descriptive coding method and in level two, the focused coding method was employed to analyse the raw qualitative data. Details of the coding methodology are described in chapter 6, section 6.3. Eisenhardt (2002) explains that a framework development process can be completed through the three stages of, (1) improving the constructs, (2) verification of the relationships between attributes, and (3) Confirming the designed factors with the literature. The research follows this approach to formulate the elements of the ESI framework.

This research compares the different attributes addressing the participants' concerns about residential construction sector projects that helped to formulate the ESI elements designed for improving the quality delivery of such projects. The second stage in the process of framework development was to verify the relationship

between attributes. To achieve this purpose, the approaches and factors suggested by industry practitioners were listed and further interviews were conducted to test the integrity and efficiency of them. This process enhanced the validity and reliability of relationships (Eisenhardt 2002). The final stage if formulating the ESI framework is to compare its elements with supporting literature; therefore, this research discussed and supported the ESI framework elements related back to the earlier review of the literature.

The next section, explains some of applied tests of research quality in terms of its validity, reliability.

4.7 RESEARCH QUALITY

Assessing the quality of the research can be different in the quantitative and qualitative approaches (Sutrisna 2009). Concepts such as validity, reliability and generalizability are often used in quantitative research (Fink 2009; Ahadzie et al. 2008), but, according to Stenbacka (2001) they may not necessarily be applicable for qualitative research. For this reason, many researchers have developed other concepts to assess the quality of their work (Denzin and Lincoln 2000; Golafshani 2003). For instance, Lincoln and Guba (1985) refer to truth, value, applicability and consistency, while Yin (2009a) used the concepts of construct validity, internal and external validity and reliability. As this research uses the mixed methods approach, it looks into the concepts of reliability and validity to determine the research quality.

4.7.1 Validity

To ensure that the research findings are based on critically-based investigations, they require to be validated. Validity and reliability of quantitative data can be ensured by conducting a pilot study. The validity is measured by the level of precision of the information obtained (Fink 2009). To improve the effectiveness of the pilot test, it is suggested that the pilot respondents are selected from the similar group to the sample population of the main survey. For this reason, some of the pilot test survey respondents in this study were drawn from the wider research population that participated in the overall survey and the interviews.

To ensure validity in qualitative research, Yin (2009a) suggested the use of multiple sources (referred to as triangulation) for data collection. To achieve this and to improve the integration, this research approached multiple data points (five residential building projects) to collect the data. Furthermore, in order to advance the internal validity and understand the relationships between events, the type of analytical techniques were carefully considered. To this end, multiple analytical techniques such as descriptive coding, and focused matching were conducted to illustrate how the target elements were formulated.

To reduce the probability of incorrect reporting and increase the validity, it is highly recommended that the report of the final outcomes is reviewed by the case study respondent is (Yin 2009a). Accordingly, a second round of interviews with industry practitioners was conducted to obtain their feedback on the final results. Consideration and reflection of their comments improved the quality of the findings.

4.7.2 Reliability

The reliability of data is related to the data points and identifying the position held by people who participated in the data collection process. For this research, it was critically important that only people, who had the relevant knowledge and information about the case study projects, answered the questions.

To fulfil this aim, in the first stage of data collection (questionnaire), responses were checked to make sure that only the people from the management level were participating in the survey. The first section of the questionnaire (demographic questions) helped to ensure that no samples were identical to each other (Thomson 2011). In addition, data reliability and consistency in the questionnaire was examined though the analysis of Cronbach's alpha (α) (Ahadzie,Proverbs and Olomolaiye 2008). Each element of the questionnaire was found to be reliable since the value of α was equal or greater than 0.7. This also indicates the variables are internally consistent (Bryman and Cramer 2009). Detailed calculation of (α) is explained in next chapter (5), section 5.5.

In the qualitative approach, the term 'reliability' refers to the consistency of the results (Sutrisna 2009). However there is no general consensus about this definition in the literature. For example, in a view of Stenbacka (2001) the application of the

reliability in qualitative research approach might be problematic. She (ibid, 2001, p.552) advocates that " the basic distinction that makes reliability irrelevant is the notion of measurement, which is not relevant in qualitative research" (Stenbacka 2001, 552). Nevertheless, Yin (2009a) and Eisenhardt (1989) believe that enhancing consistency in qualitative analysis is a requirement to accomplish more reliable results. This approach is considered in the present research for improving the reliability of the findings.

Yin (2009a) states that the case study protocol extends and improves the reliability of a research study. This research develops a case study protocol (see Appendix E) that provides a clear direction for the interview process and expands the consistency of the research. In addition, the coding process implemented in this research increases the reliability of the analysis and justifiability of the interpretations (Auerback and Silverstein 2003). Another method of improving rigour and thoroughness is to keep a database for each case study, as suggested by Yin (2009a). For this reason, all the interview transcriptions and documents were stored into a single NVIVO file, thus making them more accessible.

4.8 SUMMARY

The purpose of this chapter was to outline the strategies and methods used for data collection and analysis in this research. This chapter firstly introduced the philosophical perspective of the research and then explained and justified the use of a mixed-methods approach (combination of case study and survey methods) to collect the required data.

A clear description and logical setting down of the various research steps, the activities included in each step and the main objectives of each step were then illustrated. Accordingly, the analytical approaches of the qualitative and quantitative methodologies were explained. This chapter concluded with the clarification of the various tests applied to ensure rigour and the overall research quality and outlined the steps to ensure the validity and reliability of data collection process as well as the findings. The next chapter presents the results of the statistical (survey) analysis.

Chapter 5: Stakeholder Involvement: The Impacts on Quality Issues

5.1 INTRODUCTION

Chapter 3 explained the major methodologies applied to collect data and also introduced the methods used for data analysis. Two rounds of quantitative and qualitative analysis were applied in this research to provide the required information. This chapter demonstrates the results of the quantitative data analysis, which was performed to address the first and second research questions.

There were two fundamental purposes for collecting and analysing the first round of data. The first is to develop an understanding about the current levels of stakeholder involvement in the planning process of construction building project lifecycles. The second is to determine the impacts of greater and more effective stakeholder involvement in eliminating the root causes of many quality issues that typically happen in building projects. The findings offered in this chapter reveal the potential for integrating the theories explored in the literature review and practices advocated based on the data gathered.

5.2 OPERATIONALISATION OF THE SURVEY

5.2.1 Grouping Questions and Survey Distribution

To design and setup the survey questionnaire, enquiry questions were grouped from the general to the more specific. The questionnaire consists of four main sections drawn from the literature review and existing theories.

The first section of the questionnaire was developed to collect information about the characteristics of stakeholders in terms of work experience, roles in their projects and the type of projects they were involved in. Since this research focuses on residential building projects, it was important that the respondents were/are involved in these types of projects. Information about their organisational roles is also important for comparing different levels of stakeholder involvement.

In the second section of the survey, questions were designed to answer the first research question which is;

> *What is the current level of stakeholder involvement in the planning process of construction building projects?*

During the planning phase of the PLC, the process that focuses on setting the quality requirements is called the quality planning process and is divided into five phases. Each phase contains a number of corresponding factors that constitute the objectives of that phase. These factors were derived from the quality planning process proposed by Juran and Godfrey (1999). In order to adapt the process with the project management context, it was then completed with the concepts of planning and quality planning derived from PMBOK (PMI 2008a). The questionnaire was reviewed, revised and validated by adding, removing and changing some items originally presented in the pilot test. As a result 37 questions were presented to evaluate the current level of stakeholder involvement in each phase of the process. A five point Likert scale with a range from 1 representing "Not Involved/Very Low" to 5 "Very High" measured the respondents' perceived levels of involvement in different phases of the planning process.

The third section of the questionnaire outlines the expected levels of improvement to current quality problems that can be achieved, in the view of respondents, through more effective and efficient stakeholder involvement in the project. This section was designed to answer the second research question which is;

> *To what extent can stakeholder involvement improve major root causes of quality issues?*

The contributory factors in terms of the causes of quality defects derived from the literature review were listed and grouped. Similarly as described for the second section, the list was reviewed and revised through the pilot test. Finally 31 items were compiled and the respondents were asked to provide their opinions on the improvement levels of these items.

The final section of the questionnaire is designed to examine the respondents' opinions of the importance of different stakeholders' involvement in the planning process. The purpose of this section was basically to confirm that the research has

addressed the key participants of residential building projects. Again, a five point Likert scale that ranges from 1 representing "Very Low" to 5 "Very High" was employed to measure the importance level stakeholders.

QUT *Key Survey* (2011) was used to design and distribute the questionnaire. Key Survey is an online survey creation tool and based on the following advantages it was used in this research.

- *Simplicity*: It is easy-to-learn and easy-to-use
- *Convenience*: Key survey system represents a convenient and well-organized way to gather responses. It allows the respondents to receive the questionnaire and complete it in their own privacy
- *Fast data collection*: The survey can be distributed easily and it is easy for respondents to answer, so you can expect faster response back and higher response rate
- *Specialised Population*: This online survey system is generally useful in accessing target research population whose email addresses are eagerly available
- *Ease of Follow up*: Target respondents can be easily reminded to answer to the survey through sending follow up emails
- *Applicable Outcomes*: It helps to create/analyse robust & customizable reports
- *High Functionality*: Key Survey works with other programs including Outlook, Excel, SPSS, etc. So it is easy and fast to import the data to any of those software
- *Secure storage*: All respondent data is stored and maintained within a secure network

Key Survey was the main instrument for survey data collection, however, the questionnaire was also sent out through conventional mail to several companies that had provided their addresses or expressed a wish to receive the survey in this manner. This process helped to increase the response rate.

5.2.2 Pilot Study

Questionnaires are typically designed to collect data from certain groups of respondents. The pilot study is necessary to improve the validity and efficiency of the experiment before the actual data collection starts. A pilot study is usually small

compared to the main data collection process. Although implementing a pilot study does not assure success in the main study, it does enhance the probability of success. It is suggested that in construction and project management research, a draft of questionnaire should be tested to ensure that all questions are logical and understandable (Yang and Pheng 2008).

Respondents from both academia and industry were selected to participate in the pilot test. Academic experts from the construction and project management discipline were selected to provide their opinion on the theoretical aspects of the questionnaire. Six people provided useful feedback and their knowledge and experience assisted to improve the shortcomings of the initial survey draft. The industry group were practitioners who were/are involved in the residential sector such as project managers, contractors and designers. Seven respondents were finally participated and made practical and valuable comments that could help to improve the quality of the questionnaire.

As stated by Sarantakos (1998b) three methods can be used to determine the validity of a questionnaire prior to conducting the actual data collection including; interview, telephone interview and self-administered questionnaire. "The face-to-face interview is a common technique used in pilot studies to acquire extensive feedback from the respondent on the whole of the questionnaire" (Masrom 2012, p.79). In this research, a number of semi-structured face-to-face interviews were conducted to identify any mistakes in the questionnaire, the adequacy and appropriateness of questions, the validity of the content and the format and structure of the questionnaire. The second approach used in this study for the pilot survey was to run a self-administrated questionnaire. Masrom (2012) stated that this approach helps to identify whether respondents understand the questions in a consistent way or not. From the 13 people who agreed to participate in the pilot survey, six people preferred a face-to-face interview and seven people chose to provide their feedback and comments by email. The major feedback obtained from the pilot survey is outlined in table 5.1.

Table 5-1: Feedbacks from pilot survey

Draft	Respondents	Method	Comments and Suggestion
First Draft	6 Academics 7 Industry Practitioners	Face to face interview Email	• A few number of factors of the planning process and quality issues were found unreasonable or unnecessary • Some factors should be reworded • Add a few more information about the survey to the cover letter • Include a section that the respondent can add more comments
Second Draft	3 Academics 2 Industry Practitioners	Email	• Rephrase some statements

5.2.3 Sampling

It is often hard economically, and also infeasible and lengthy to collect the data from every member of the population (Levy and Lemeshow 1999), therefore a sample of population has become practical to survey so that generalisation can be contingent from the sample to the entire population (Rea and Parker 2005). It involves the selection of a small number of people and it is important they are adequate representatives of the whole population. Sampling surveys can mainly be categorised into two groups of probability and non-probability samples. According to Levy and Lemeshow (2008, p.18) "In the probability sample every units from the whole population has the known and nonzero possibility to be included in the sample, so unbiased estimates of population parameters that are linear functions of the observations can be constructed from the sample data". On the other hand, non-probability sampling does not have these features and the user has no clear and applicable method to assess the reliability and the validity of the outcomes. As stated by Rea and Parker (2005) in non-probability sampling, the selection procedure is not formal; information about the population is limited and consequently the possibility of choosing any given unit of population cannot be determined. In addition, sample surveys should produce estimates that can be assessed statistically with regard to their likely values and standard errors (Levy and Lemeshow 2008). For the purpose

of this research probability, sampling was used to draw an appropriate number of respondents.

Survey Sampling Techniques

A number of statistical sampling methods are used to draw a sample from the targeted population (Westfall 2008) such as simple random sampling, systematic sampling and stratified random sampling. Of these, one of the most popular methods is simple random sampling. In this method, every member from the population has the equal possibility to be chosen as part of the sample as any other member. This sampling method can be made with or without replacement. When a population member can be selected more than one once, it is called sampling 'with replacement'. Conversely if the population member can be selected only one time, it is called 'without replacement' (Westfall 2008). In the systematic sampling technique, the user divides the entire number of elements/members by the number of elements to be selected (sampling interval = n). The next step is to determine a starting point on the list at random. Then every nth element on the list from this starting point will be selected. Systematic sampling is considered equivalent to random sampling as long as no recurring pattern or particular order exists in the listing.

The next sampling technique is called stratified simple sampling. This method is used when representatives from each subgroup within the population need to be represented in the sample (Fink 2009). The first step in stratified sampling is to divide the population into subgroups (strata) based on mutually exclusive criteria. Random or systematic samples are then taken from each subgroup. Another way to apply this technique is to calculate the size of the whole sample through simple random, or systematic, sampling techniques and then divide it by size of the population, and finally multiply the results to the size of each group (stratum). This research employed this latter technique since it needs to include representatives from each group of stakeholders. Based on the objectives, context and limitations of each study, other sampling techniques such as cluster, haphazard and judgmental sampling can be used.

To facilitate sampling, the list of stakeholders according to their organisational roles was gathered from reliable and valid resources such as Brisbane City Council and Master Builder Associations of Queensland. Around one thousand companies were found that related to the context of this research and these were divided into four main groups.

Random sampling was first used to calculate the required amount of population for the actual data collection stage. Considering the desired confidence level of 95% and the 10% margin of errors, a total number of 87 responses were required for this research. Then, using a stratified random technique, the required number of responses from each group of participants was determined. Table 5.2 shows the final results of sampling.

Table 5-2: Dispersion of respondents/Sampling results

Types of stakeholders	Number	Required number in each group (stratum)
Owner/developer	270	24
Construction and Project Management	290	26
Designer	195	18
Contractor	215	19
Total	**970**	**87**

Response Rate (RR):

In the majority of survey research there is often a certain amount of missing data, uncompleted questions and unusable or invalid responses, however in most cases the percentage is not too much and can be ignored (Baruch 1999). In the present research, relevant RR refers to the valid number of returned questionnaires. To facilitate the number of responses, approximately 200 questionnaires were distributed during the months of April and May 2012 and 85 responses were returned of which 77 were valid for data analysis. This represents a response rate of 31%, which according to Yehuda (1999) is a satisfactory number of responses from an overall population sector. Eight responses were found to be unacceptable because the

respondent's current or previous employment status, based on the criteria of this research, was not suitable or many questions were left unanswered and resulted in some uncompleted sections. Respondents were selected based on the scope and limitation of the research as well as their contact information availability.

5.3 ANALYSIS OF STAKEHOLDER'S PROFILE

This section indicates the profile of the respondents in terms of their position, years of experience, nature of the organisation and the type of projects that they were involved in. Investigating the general profile of the research population is important to be considered prior to analysing and interpreting the findings (Egemen and Mohamed 2006). For the purpose of this research and in order to compare the level of involvement it was necessary to categorise the respondents based on their organisational role. Furthermore, in the next stage of data collection, case study interviews were undertaken focusing on residential building project experienced respondents, so as to achieve a valid and reliable interpretation, respondents were chosen who were currently, or previously had been involved, in the residential sector. Therefore a question was designed to identify the type of projects in which the respondents were involved. Responses indicating no engagement in residential projects were treated as unacceptable.

In addition, since this section of data collection basically focuses on the initial phase of project lifecycle, a yes/no question was included, designed to examine the involvement of respondents in the initial phase of project lifecycle. Clearly responses received from those who were not involved in the approval/planning phase were considered as unacceptable responses and removed from the analysis. Figure 5.1 illustrates survey analysis process.

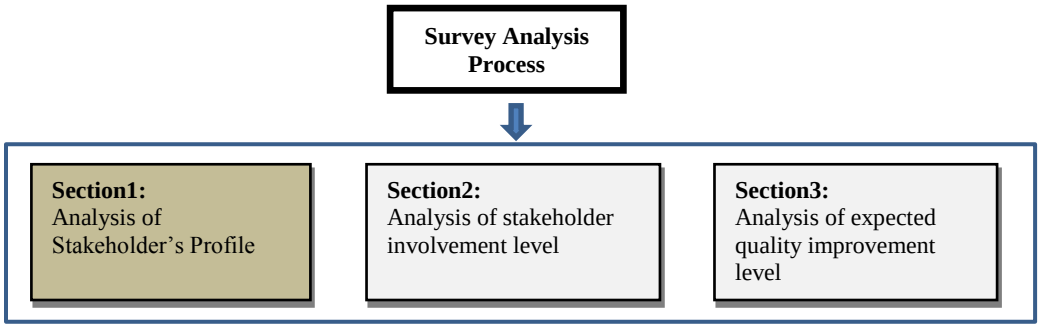


Figure 5-1: Survey analysis process

Position

Through an open-end question format, respondents were able to identify their position on their projects, or within their companies. Table 5.3 indicates that more than 90% of the respondents were from the top and middle management levels. Since this research focuses on the strategic management level, the results of this section confirm that appropriate people were approached. Other positions include respondents either from low level management level, or who are not at the management level.

Table 5-3: Position

Position Indicated	Frequency	Percent	Cumulative Percent
Project Manager	19	24.7	24.7
Job Manager	12	15.6	40.3
Project Coordinator/Director	18	23.4	63.7
Job Manager	9	11.7	75.4
Lead Architect	5	6.5	81.9
Lead Project Planner	7	9	90.9
Other	7	9	99.9
Total	77	100	100

Organisational Role

Figure 5.2 illustrates the distribution of respondents' organisational roles. Four categories are used to identify groups of stakeholders. As shown, the highest return rate was from construction/project management companies with 25 respondents (32.5%), whereas owner/developers have 21 responses (27.3%) and 17 respondents (22.%) are contractors, closely followed by 14 designer respondents, (18.2%). Considering the number of each group in the sampling list, this percentage confirms that appropriate number of responses was received.

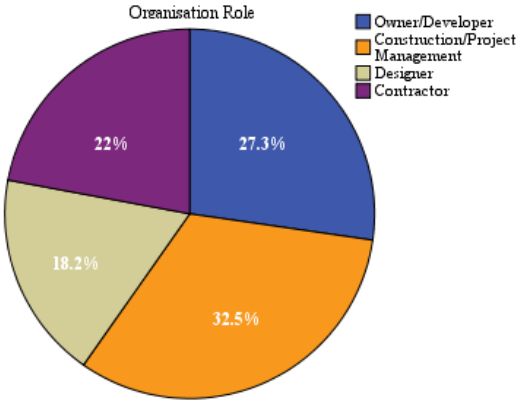


Figure 5-2: Organisation Role

Years of Experience

Related to the years of work experience, Figure 5.3 indicates that nearly 65% of the participants have been working more than 16 years in the construction industry. 29.9% of respondents had 11 to 15 years of work experience in the industry and only 5.2% involved less than 10 years in the industry. This profile signifies the remarkable experiences on which the results to this survey were based.

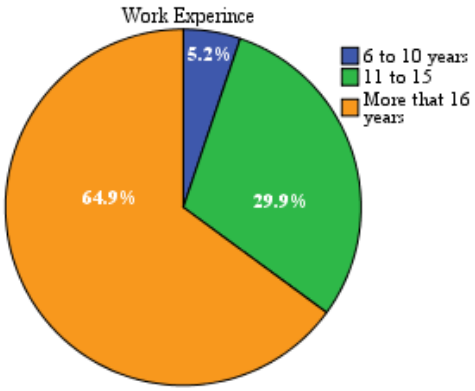


Figure 5-3: Years of experience

5.4 THE ANALYSIS OF STAKEHOLDER INVOLVEMENT LEVEL

The primary aim of the analysis in this section is to determine the current level of stakeholder involvement (SI) during the planning process. As explained in chapter 3, the planning process that aims to achieve quality requirements is categorised into five main phases namely; Establish the project (EP), Identify Stakeholder/Customer

(IS), Develop the project (DP1), Develop the process (DP2) and Control and Operation (CO). Each of them includes items corresponding to the objectives of that phase. This classification was used to facilitate this analysis. Respondents were asked to demonstrate their level of involvement though the following question:

> *Tick the appropriate box that best describes your level of involvement in the following activities of the planning process of the project*

Respondents perceptions were examined using a five point Likert scale as follows: 1=Not involved/Very low, 2= Low, 3=Average, 4=High and 5=Very high.

Descriptive analysis was used in this section to evaluate the weaknesses and strengths based on an examination which measures the mean, median and standard deviation. This form of analysis gives a detailed observation of the involvement level of respondents within each phase of the planning process. To identify unique qualities, the mean and median results of the five main phases were considered in relation to the characteristics of each significant variable. In addition, this section compares the levels of involvement among different stakeholder groups through the use of an inferential statistical procedure. This is shown in Figure 5.4 is the second stage of the survey data analysis process.

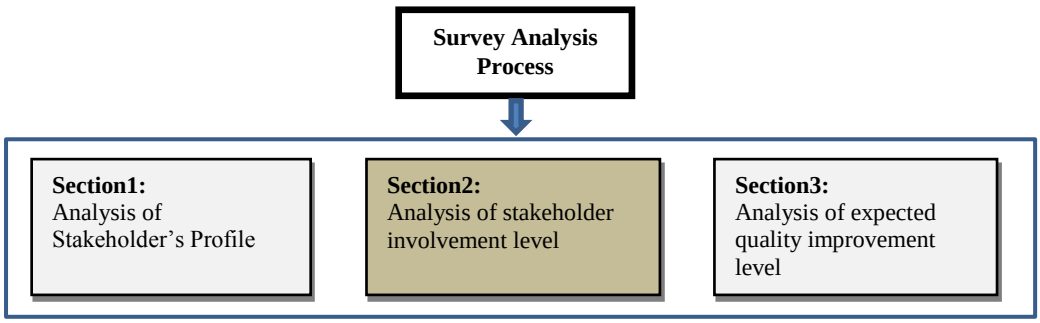


Figure 5-4: Survey analysis process

Box Plot

The box plot provides the useful results regarding samples rang median, normality and skew of distribution. It comprises a box encased by two outer lines known as 'whiskers'. The centre line of the box is the sample median. The box represents the middle 50% of the data responses and the remaining half of the sample

is contained within the area between the box and the whiskers. The upper edge (hinge) of the box indicates the 75th percentile of the data set, and the lower hinge indicates the 25th percentile. The range of the middle two quartiles is known as the inter-quartile range. There might be some observations outside the ends of whiskers called outliers. An outlier is an observation that lies an abnormal distance from other values in a random sample from a population. In the process of data analysis unusual observations (outliers) can be removed from the mass of data and related analysis. However, before considering the possible elimination of these points from the data, one should try to understand why they appeared and whether it is likely similar values will continue to appear.

5.4.1 Evaluation of Survey Constructs

A number of methods are available for determining the consistency (reliability) of multiple item scales. To examine the reliability of data, Cronbach's Alpha was used to consider the internal consistency (Bryman and Hardy 2009). Items with a value equal to or greater than 0.7 were considered reliable. According to Sekaran and Bougie (2009), the value of alpha (α) greater than .80 is considered to be good, between .07 and .08 is acceptable and below .07 is poor. Table 5.4 shows that each of the planning items is reliable as the Alpha coefficients were all greater than 0.77

Table 5-4: Reliability test (Cronbach's Alpha)

Alpha	Phase	Items	N
0.77	Establish the Project	5	77
0.80	Identify Stakeholder/ Customer	4	77
0.90	Develop the Project	15	77
0.86	Develop the Process	8	77
0.85	Control and Operation	5	77

Table 5.5 indicates that all items associated with each phase were significantly positively correlated and all questions were retained, as there would be no improvement by deleting any. For the 'Develop the Project' scale, some items had only very small non-significant correlations, but the Chronbach's alpha was still .90 and it was not improved by deleting any of these items.

Table 5-5: Correlation matrix for the five scales

N = 77	Project Estab.	Id Stakeholder	Project Development	Process Development	Control & Operation
Establish the Project	-	.82**	.77**	.72**	.60**
Identifying Customer/Stakeholder		-	.76**	.79**	.52**
Develop the Project			-	.76**	.67**
Develop the Process				-	.69**
Control & Operation					-

Note: ** $p < .001$

5.4.2 Examination of stakeholder level of involvement in the planning process

As mentioned earlier in this chapter, the planning process, which aims at achieving desired quality objectives, is divided into five phases. This section examines involvement levels of all stakeholders in these five phases. The mean and median of responses have been used to reflect the degree of involvement. Respondents perceptions were examined using a five point Likert scale; 1=Not involved/Very low, 2= Low, 3=Average, 4=High and 5=Very high. Therefore, if the value of mean and median is around 4, it represents generally a high level of involvement, whereas a mean value of around 2 indicates a low involvement level. Clearly if the score of the mean or median is around 3, it shows that the involvement level for that particular stakeholder in a certain phase is only 'average'. The use of box plot and whiskers (as previously discussed) will prevent flattening of the results since it visually illustrates the dispersion of data and provides a better interpretation of the situation.

Table 5.6 indicates overall level of stakeholder involvement in fives phases of the planning process. It demonstrates nearly high level of stakeholder involvement in the EP phase. This can be observed though the mean and median score which is close to 4. The mean score of 3.4 shows that respondent's involvement in the DP2 phase is above average. Results demonstrate equal level of engagement in the IS and DP1 phases where the mean value of 3.2 represents the average level of involvement. Lastly project participants have the lowest level of engagement in the CO phase.

Table 5-6: Overall stakeholder involvement level

Planning Process Phases		Value	Std. Error
Establish the Project (EP)	Mean	3.6	.093
	Median	3.6	
	Variance	.666	
	Std. Deviation	.816	
Identify Stakeholder (IS)	Mean	3.2	.081
	Median	3.25	
	Variance	.513	
	Std. Deviation	.715	
Develop the Project (DP1)	Mean	3.2	.064
	Median	3.25	
	Variance	.319	
	Std. Deviation	.564	
Develop the Process (DP2)	Mean	3.4	.071
	Median	3.5	
	Variance	.388	
	Std. Deviation	.623	
Control and Operation (CO)	Mean	2.9	.085
	Median	2.8	
	Variance	.562	
	Std. Deviation	.749	

To obtain a deeper understanding of how each group of respondents is involved in the planning process, the next section analyses the level of involvement based on organisational role of each stakeholder in the project.

5.4.3 The influence of organisation role on stakeholders level of involvement

This section analyses the level of the four group of project participants' involvement in different phases of the planning process. Descriptive statistics was adopted to determine the measures of central tendency (mean and median) and measures of dispersion (standard deviation and variance).

Phase 1: Establishing the Project Phase (EP)

It was found that owner/developer (O/D) and construction/project management (C/PM) groups were highly involved in the project establishment. This can be

observed from the mean and median scores which are around 4. Designers on the other hand, do not contribute so highly in the activities of this phase and the value of mean is close to 3 representing only an average level of involvement. The lowest involvement is found amongst the contractor group, where the mean score of the responses is around 2.4 representing below average engagement. Such results were expected since the project establishment stage, which includes strategic activities, is only be undertaken by project decision makers such as the client and project management team. However, obtaining information from other key parties such as designers and contractors would be very beneficial in forming a comprehensive project plan.

On the other hand the decision makers can improve the success of the process though establishing a system which can improve the efficiency of the activities which can direct or indirect impact of the performance of project members.

Table 5-7: The level of involvement in the 'Establish the Project' phase

Groups of Stakeholders		Value	Std. Error
Owner/Developer	Mean	3.9	.084
	Median	3.8	
	Variance	.150	
	Std. Deviation	.387	
Construction/Project Management	Mean	3.9	.12
	Median	4.2	
	Variance	.366	
	Std. Deviation	.604	
Designer	Mean	3.2	.206
	Median	3.2	
	Variance	.598	
	Std. Deviation	.773	
Contractor	Mean	2.4	.088
	Median	2.4	
	Variance	.133	
	Std. Deviation	.364	

Figure 5.5 indicates that both O/D and C/PM groups are more involved in EP compared to designers and contractors in this phase. This can be interpreted from the box plots in the figure showing that 75% of responses are above 3.5 and the middle

50% of responses are around the score of 4. Designers, compared to these two groups, are slightly less engaged, but still 75% of responses are above the average. It was determined that all contractors have a below average level of involvement as more than 75% of responses are between 2.2 and 3.

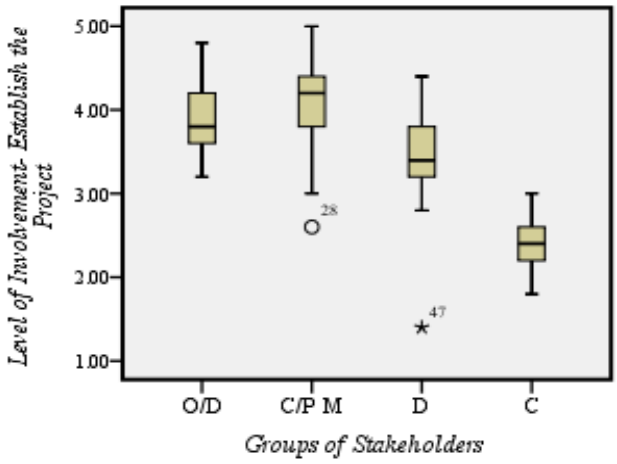


Figure 5-5: Dispersion of data in the 'Establish the Project' phase

Phase2: Identifying the Stakeholder/Customer Phase (IS)

Results indicate that the level of involvement is above average for both O/D and C/PM groups. This can be concluded from the mean score of the responses. This phase of the planning process is very significant since all stakeholders' needs and expectations are collected and analysed. Since the important decisions in relation to collecting, assessing and unifying stakeholder's demands are completed by these two groups, they need to adopt a common approach to improving their levels of involvement and contribution in this phase.

The mean and median scores are close to the value of 3 representing average involvement of designers. Finally the lowest degree of contribution is for contractors with a mean score of 2.2.

Table 5-8: The level of involvement in the 'Identify Customer/Stakeholder 'phase

Groups of Stakeholders		Value	Std. Error
Owner/Developer	Mean	3.5	.093
	Median	3.25	
	Variance	.185	
	Std. Deviation	.43	
Construction/Project Management	Mean	3.5	.124
	Median	3.5	
	Variance	.389	
	Std. Deviation	.623	
Designer	Mean	3.1	.149
	Median	3.25	
	Variance	.315	
	Std. Deviation	.56	
Contractor	Mean	2.2	.109
	Median	2.25	
	Variance	.202	
	Std. Deviation	.45	

Figure 5.6 shows nearly equal dispersion of responses for the O/D and C/PM groups. An equal spread of responses means that each quarter of the whiskers contains almost the same number of responses. The location of the median line related to the first two groups suggests skewness in the distribution as it is noticeably shifted away from the centre. It indicates that involvement level is skewed towards the average score. Above average levels of involvement of O/D and C/PM can be observed from the position of the box, which represents 50% of responses between the score of 3 and 4. Conversely, contractors have a lesser involvement in this phase as 75% of their responses are around 2.

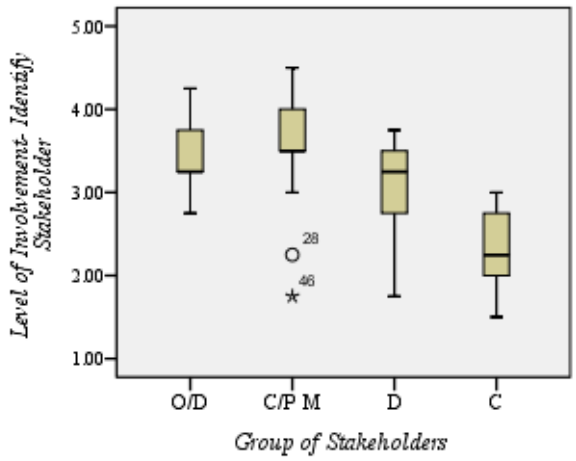


Figure 5-6: Dispersion of data in the 'Identify Customer 'phase

Phase 3: Developing the Project Phase (DP1)

Results demonstrate fairly similar situations for the three groups of O/D, C/PM and Designers. This is perceived from the mean score representing an above average (but still less than high) degree of involvement in this phase of the planning process. Because many important activities such as grouping stakeholder's needs, developing the project schedule, develop project goals and features, and identifying acceptance criteria for project deliverables are implemented in this phase, a higher level of contribution of key project members is generally expected. As shown in Table 5.9, the contractor contribution to this phase, similar to other phases, is at a low level.

Groups of Stakeholders		Value	Std. Error
Owner/Developer	Mean	3.4	.051
	Median	3.4	
	Variance	.056	
	Std. Deviation	.234	
Construction/Project Management	Mean	3.5	.114
	Median	3.5	
	Variance	.326	
	Std. Deviation	.571	
Designer	Mean	3.3	.146
	Median	3.2	
	Variance	.302	
	Std. Deviation	.549	
Contractor	Mean	2.4	.045
	Median	2.4	
	Variance	.035	
	Std. Deviation	.187	

Table 5-9: The level of involvement in the ‘Develop the Project ‘phase

Although the median score of the O/D and CPM groups is equal, the dispersion of responses is not exactly the same. Figure 5.7 illustrates that a very high number of responses in the O/D group are contained within a very small segment of the sample. On the other hand the larger box of the C/PM group signifies the wider dispersion of data. Designers exhibit a similar distribution to the C/PM group as the middle box of 50% of data is above 3. An outlier is presented in this group, specifying an extreme value that deviates significantly from the rest of the sample. However, since there is only one outlier in this category it can be eliminated.

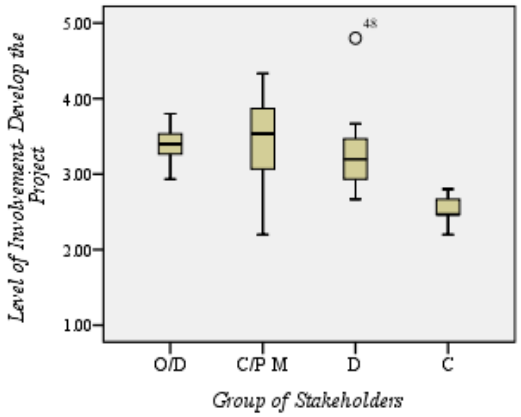


Figure 5-7: Dispersion of data in the 'Develop the Project' phase

Phase 4: Developing the Process Phase (DP2)

The mean and median score shown in Table 5.10 demonstrates that C/PM and O/D group levels of involvement are close to high. In contrast, the contractor's level of involvement in this phase is below average. Compared to the contractors, designers are more involved as their mean score is above the average.

Table 5-10: The level of involvement in the 'Develop the Process' phase

Groups of Stakeholders		Value	Std. Error
Owner/Developer	Mean	3.6	.091
	Median	3.75	
	Variance	.177	
	Std. Deviation	.420	
Construction/Project Management	Mean	3.7	.126
	Median	3.75	
	Variance	.402	
	Std. Deviation	.634	
Designer	Mean	3.4	.191
	Median	3.6	
	Variance	.514	
	Std. Deviation	.716	
Contractor	Mean	2.5	.090
	Median	2.5	
	Variance	.139	
	Std. Deviation	.372	

Even though the median score of the O/D and CPM groups is equal, the distribution of data is not exactly the same. Figure 5.8 illustrates that, the same as the previous phase (DP1), a very high number of responses in the O/D group are contained within a very small part of sample. However a few numbers of outliers indicate that a number of respondents in this group were considerably less involved in this phase. The wider box of the C/PM group signifies a greater spread of data. Compared to these two groups, designers are slightly less involved since 25% of responses are between the value of 1.8 and 3 and the median score is 3.6. Similar to the other phases, contractors have the least engagement level in this phase.

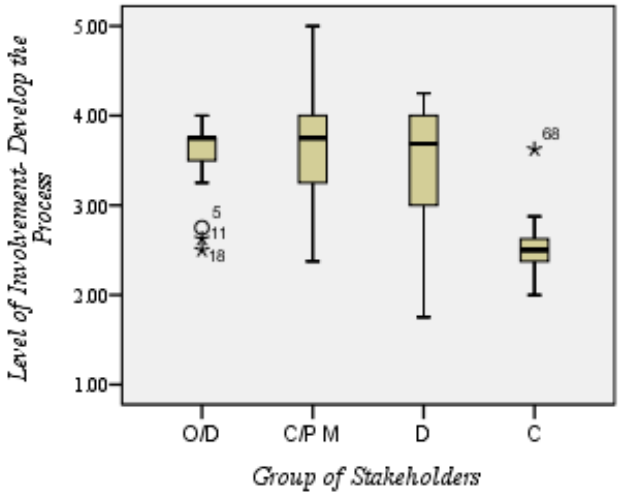


Figure 5-8: Dispersion of data in the 'Develop the Process 'phase

Phase 5: Control and Operation Phase

It was found that the O/D and C/PM groups, compared to the other phases, are slightly less involved in the control and operation phase. This can be observed from the mean and median scores, which are around 3, indicating an average involvement level. Even though contractors are less involved than other groups, the median score of 2.6 shows their higher engagement in this phase compared to other phases of the planning process.

Results from Table 5.11 show that key project stakeholders do not highly contribute to planning and implementing the activities associated with this phase. Since this phase include significant activities such as designing a feedback process and determining criteria for effective control, decision-makers need to adopt practical and positive approaches to improve the involvement of key project participants.

Table 5-11: The level of involvement in the ‘Control and Operation ‘phase

Groups of Stakeholders		Value	Std. Error
Owner/Developer	Mean	2.9	.083
	Median	3	
	Variance	.146	
	Std. Deviation	.381	
Construction/Project Management	Mean	3	.187
	Median	2.8	
	Variance	.878	
	Std. Deviation	.936	
Designer	Mean	3	.261
	Median	2.6	
	Variance	.956	
	Std. Deviation	.978	
Contractor	Mean	2.5	.090
	Median	2.6	
	Variance	.14	
	Std. Deviation	.373	

Figure 5.9 indicates that the distribution of data relating to the O/D, designer and contractor groups is skewed. The wider box shows that the middle 50% of designer’s responses are distributed between the value of 2.4 and 4, while the middle box representing data of the O/D group is distributed in a smaller range. The box relating to C/PM group also represents the normal distribution of data.

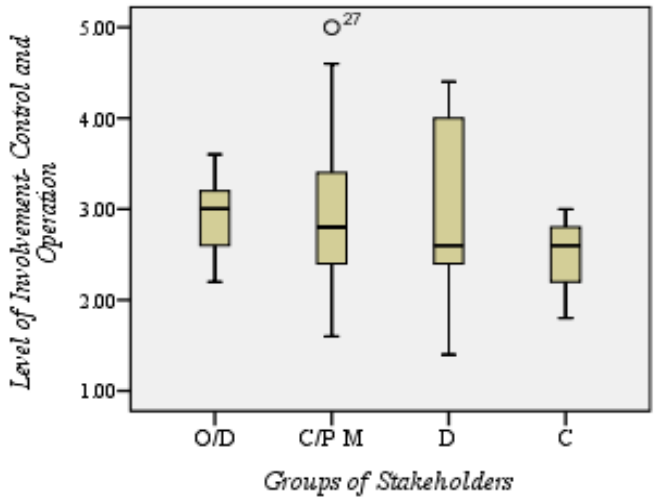


Figure 5-9: Dispersion of data in the ‘Control and Operation ‘phase

5.4.4 Comparing Levels of Stakeholder Involvement

This section compares the levels of stakeholder involvement in different phases of the planning process based on their organisational roles in the project. The parametric one-way analysis of variance (ANOVA) was used to perform this comparison.

An ANOVA determines that there is a significant difference somewhere between the means, however, it does not actually show where that difference is. Once a significant result is found, there are various post hoc tests that can be employed in order to find where the means are significantly different. The categorical variable of stakeholder type was used as a factor to compare the mean differences between each stakeholder. While there was a violation of the homogeneity of variances assumption for two of the four significant one-way ANOVA tests, the patterns of variance were the same for all five ANOVAs. Furthermore, when the Kruskal-Wallis non-parametric omnibus tests were checked, they gave the same four significant outcomes and one non-significant outcome. The purpose of applying the parametric and non-parametric procedures was to confirm that both of these analyses produce the same results. If the Kruskal-Wallis tests had given different results than that might have been a reason to question the use of parametric ANOVA, however this did not occur.

In addition, the variance inequalities are understandable when standard deviations are compared across the four groups for each of the five ANOVAs as in all cases, the stakeholder group with the smallest standard deviation is the contractor group, and in all except one of the analyses, the contractor group was significantly lower in their mean involvement than the other three stakeholder groups. In the ANOVA where the contractor group was not significantly lower, there was a trend to the same pattern of mean differences as for the other four ANOVAs. Moreover, not only did two of the significant ANOVAs not have violations of homogeneity, but also the other two significant ANOVAs had the same pattern of results. It was determined that not only is the contractor group uniform in its lower average stakeholder involvement, but it also has a smaller standard deviation in all comparisons.

In order to be certain of avoidance of a type I error (finding significance where there is none), a stricter critical alpha of $p < .01$ (rather than $p < .05$) still gave a significant outcome for the four dependent variables of EP ($F(3, 73) = 34.81$, $p < .01$), IC ($F(3, 73) = 22.21$, $p < .01$), DP1 ($F(3, 73) = 19.49$, $p < .01$), and DP2 ($F(3, 73) = 9.80$, $p < .01$). The one-way ANOVA for the dependent variable control and operation was not significant ($F(3, 73) = 2.34$, $p = .081$). Table 5.12 illustrates the overall result of the ANOVA test.

Table 5-12: The results of the ANOVA test

ANOVA						
Planning Phases		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Establishing the Project (EP)	Between Groups	29.789	3	9.93	34.81	.00
	Within Groups	20.820	73	.28		
	Total	50.609	76			
Identifying Stakeholder/Customer (IS)	Between Groups	18.589	3	6.19	22.21	.00
	Within Groups	20.362	73	.27		
	Total	38.951	76			
Developing the Project (DP)	Between Groups	10.771	3	3.59	19.49	.00
	Within Groups	13.443	73	.18		
	Total	24.214	76			
Developing the Process (DP1)	Between Groups	8.474	3	2.82	9.80	.00
	Within Groups	21.037	73	.28		
	Total	29.511	76			
Control & Operation (CO)	Between Groups	4.029	3	1.343	2.34	**.081**
	Within Groups	38.650	73	.529		
	Total	42.679	76			

Figure 5.10 compares the involvement levels of stakeholders in five phases of the planning process. It indicates that the C/PM group, compared to others, has the most efficient levels of incorporation, especially in the EP phase where the median score is above 4. Although involvement levels of the O/D and C/PM groups are nearly the same, the boxes show a wider dispersion of data among the C/PM group, especially in the DP1 and DP2 phases. Compared to the O/D and C/PM groups, designers are generally less involved. However, this discrepancy is very low in the DP2 and CO phases.

While the figure illustrates that there is no significant difference among the first three groups of respondents, contractors are demonstrating a considerably lower level of involvement in all phases of the planning process.

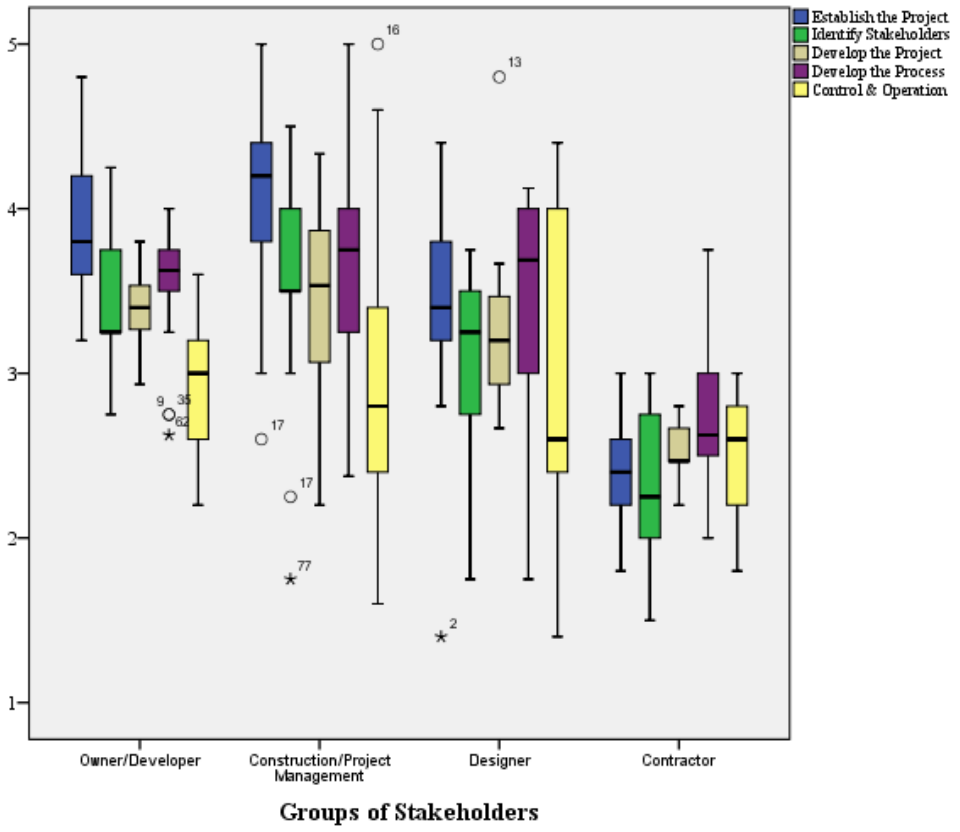


Figure 5-10: Compare stakeholder involvements in planning phases

This section of the analysis examined the current level of stakeholder involvement in the planning process. The next section identifies the results of the second part of the survey. It investigates the extent to which quality issues can be improved though more effective involvement of key stakeholders in the project, due to them applying better decision-making strategies in the early project phases.

5.5 THE ANALYSIS OF IMPROVEMENT IN QUALITY ISSUES

The existing level of project participant's involvement in the planning process of project has been investigated in the previous section and the weaknesses and strengths identified. This section examines the relationship between more effective stakeholder involvement and the level of improvement in quality issues. The grouping of main causes of quality problems as explained in chapter 2, section 2.3

was used to facilitate this analysis. Respondents were asked to demonstrate to what extent more effective and efficient involvement in the project by applying better decision-making mechanisms in the planning stage can improve quality issues/problems.

> *To what extent more effective and enhanced involvement in the project can improve the following quality issue?*

Respondents perceptions were examined using a five point lLikert scale as follows, 1=Not involved/Very low, 2= Low, 3=Average, 4=High and 5=Very high.

Descriptive analysis was also used in this section to evaluate the weaknesses and strengths. It provides a detailed picture with regard to the improvement level in each category of problems. To identify unique qualities, the mean score of the four main categories was considered in relation to the characteristics of each significant variable.

Reliability of Data

Similar to the previous section, to examine the reliability of data, Cronbach's Alpha was used considering the internal consistency (Bryman and Hardy 2009). Table 5.13 shows that quality problems items are reliable as the Alpha coefficients were greater than 0.7. It is also important to consider that reliability level used for the analysis in this research is within acceptable range of construction management studies, which in many cases considers the value of 0.7 and greater, acceptable. (Pinto et al. 2009; Tabish and Jha 2011; Masrom 2012; Willar 2012).

Table 5-13: Reliability test

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.817	.812	31

Table 5.14 demonstrates respondent's opinions about the expected improvement levels of different quality issues. As shown, many of the managerial issues such as poor management commitment, poor relationship and partnering, poor supervision and monitoring system, uncoordinated needs and expectations and lack of process improvement can be significantly improved. This can be seen from the

mean score of the responses which has the value of 4 and above. Stakeholders believed that some technical problems such as design complexity and difficult data collection systems can also be highly improved, if they enhance their engagement in the project. However, they (stakeholders) do not expect elimination or high improvement in problems such as nature of uniqueness and climatic conditions.

Table 5-14: Expected Level Improvement in Quality Issues

Item Statistics			
	Mean	Std. Deviation	N
Stakeholder Managerial			
Poor Management commitment	**4.00**	.778	77
Low effective project management system	3.68	1.032	77
Poor relationship and partnering among project participants	**4.45**	.660	77
Poor supervision and monitoring system	**4.01**	.734	77
Lack of measurement and feedback system	3.66	.576	77
Supplier impact	3.71	.723	77
Lack of quality department and quality policy	3.31	.862	77
Lack of auditing system	3.05	.930	77
Absence of long term objectives	3.69	.831	77
Poor training system	3.19	.708	77
Uncoordinated needs and expectations	**4.22**	.681	77
Lack of process and continues improvement	**3.96**	.658	77
Delay in making important project decisions	3.77	.759	77
Inappropriate method of contractor selecting	3.70	.779	77
Lack of adequate knowledge, skills and information	3.65	.870	77
Technical			
Difficult application of quality systems	3.66	.681	77
Design complexity	**3.90**	.736	77
Difficult data collection system	**3.99**	.786	77
Poor performance of quality tools and techniques	3.57	.818	77
Low quality drawing and specification	3.58	.732	77
Technical Changes	2.88	.811	77
Material/Equipment/Environment			
Low quality and poor availability of resources	**4.00**	.761	77
Project size/scope	3.65	.739	77
Project complexity	**4.01**	.618	77
Low quality and Inadequate amount of material/equipment	3.69	.693	77
Nature uniqueness	1.91	.710	77
Climate and environmental issues	1.60	.693	77
Cultural/Political			

Low tendency to teamwork	3.64	.742	77
Aggressive competition during tendering	3.43	.834	77
Lack of motivation	3.65	1.073	77
Conflict with government authorities	3.52	1.059	77

5.5.1 Comparison of the Role of Stakeholders in Improving Quality Issues

The previous section confirmed that many of the quality issues can potentially be improved through the enhancement of effective involvement of stakeholders. Detailed analysis was carried out in this section to explore the impacts of each group of stakeholders on improving quality defects.

The information provided in Figures 5.11 to 5.14 determines the difference in the respondent groups' perceptions on the variables. It was found that the O/D group believes that their effective engagement can have the highest impact on C/P and S/M issues. This can be observed from the mean scores of the responses. Although contractors assume that improvement in S/M issues is not highly expected, they still believe that their efforts can considerably influence resolution of technical problems. Results demonstrate that the lowest level of improvement in issues related to material, equipment and environment. However, this is primarily due to the effect of other inevitable problems such as climate issues and nature uniqueness. The C/PM group considers that they can greatly improve major quality issues causes, particularly in the S/M, C/P and technical categories. This can be observed from the dispersion of their responses as 75% of the data is around 4.

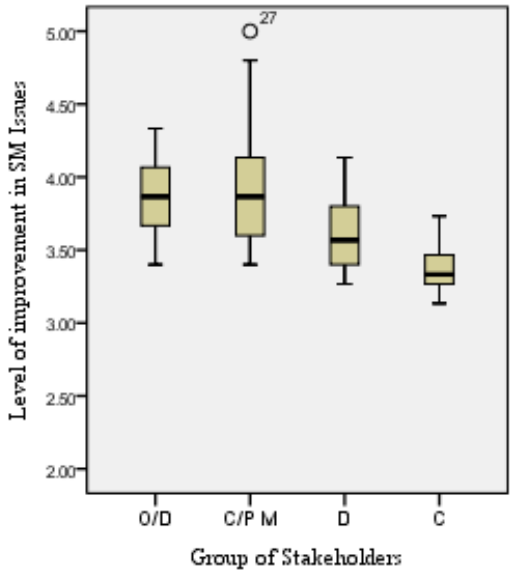


Figure 5-11: Improvement level in S/M issues

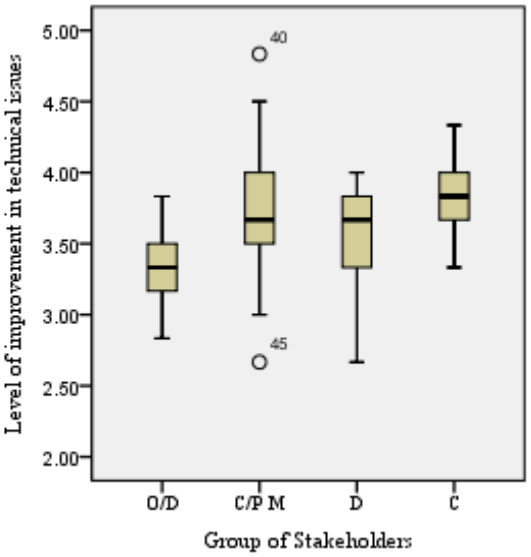


Figure 5-12 : Improvement level in technical issues

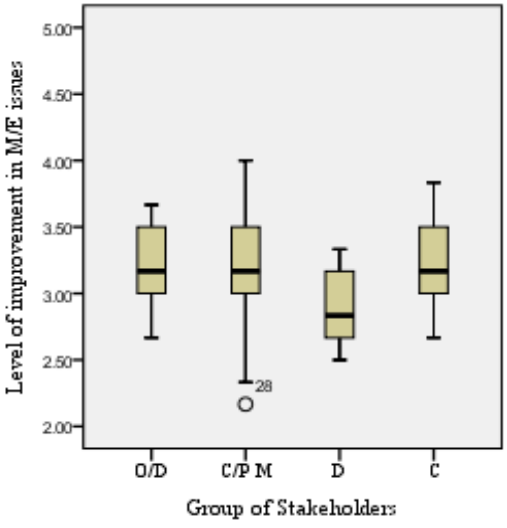


Figure 5-13: Improvement level in M/E issues

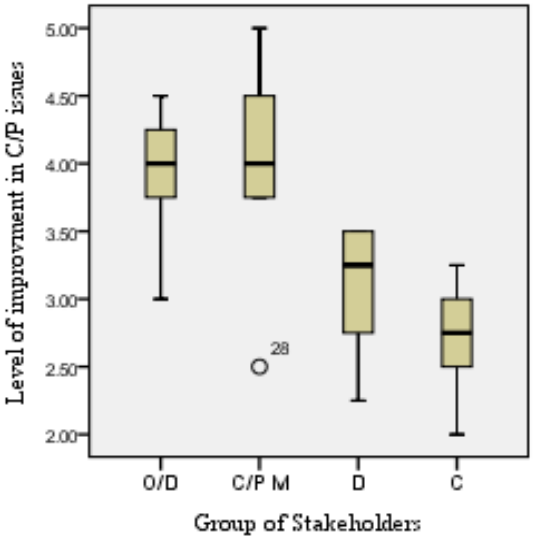


Figure 5-14: Improvement level in C/P issues

5.6 SUMMARY

This chapter examined the current levels of stakeholder involvement in the planning process. It highlighted the weaknesses and strengths of the four stakeholder groups in different phases of the process. It was found that the O/D group and C/PM group were more involved than the designer group. Results revealed that contractors have the lowest level of contribution within early project stages. This chapter also investigated the extent to which quality issues can be improved through more effective and efficient stakeholder involvement. It was determined that key project

participants play a significant role in improving and even eliminating the root causes of quality issues. Enhancing and extending the involvement of major parties in the project by applying the best decision-making strategies in the planning phase can ameliorate the high number of quality issues that typically occur in building projects. This will eventually help to achieve better quality outcomes in the final constructed project. Table 5.15 summarises the finding in this chapter.

Table 5-15: Summary of survey analysis results

Key Stakeholder Groups / Planning process	Owner/ Developer	Construction/ Project management	Designer	Contactor
LEVEL OF INVOLVEMENT IN PLANNING PROCESS				
Establish the Project	***High***	***High***	***Above average***	***Below Average***
Identify Customer	***Above Average***	***Above average***	***Average***	***low***
Develop the Project	***Above average***	***Above average***	***Average***	***Below Average***
Develop the Process	***Above average***	***High***	***Above Average***	***Below Average***
Control and Operation	***Average***	***Average***	***Average***	***Below Average***
Key stakeholder Groups / Quality Issues Categories	**Owner/ Developer**	**Construction/ Project management**	**Designer**	**Contactor**
EXPECTED LEVEL OF IMPROVEMENT IN QUALITY ISSUES/DEFECTS				
Stakeholder Managerial	***High***	***High***	***High***	***Above average***
Technical	***Above average***	***High***	***High***	***High***
Material/Equipment	***Above average***	***Above average***	***Average***	***Average***
Cultural/Political	***High***	***Very high***	***Above average***	***Average***

Chapter 6: A Framework for Effective Stakeholder Involvement

6.1 INTRODUCTION

Survey results representing the current level of stakeholder involvement during the important opening phases of the project lifecycle (PLC) were explained in the previous chapter. This chapter (6) reports the findings from the second (major) stage of data collection, which identifies problems/barriers affecting the engagement of stakeholders and, more importantly, how they can effectively and efficiently collaborate with each other and the project team from the beginning to the end of the PLC. It then establishes the principles and elements that enhance and extend the involvement of key project members. The chapter contains three main sections. The first section gives a brief description about the nature of the selected cases, how they were selected and the number of people who have been interviewed. The second section presents the method of analysis, coding of the collected data and how the analysis process was conducted. The third section then explains and examines the interview findings and ends with a summary of the major results contained within the chapter.

6.2 THE CASES STUDIED IN THE RESEARCH

High and medium rise buildings (because of their importance and diverse number of stakeholders) are the focus for this research. Five projects which were either under construction or recently constructed in the Brisbane area were selected. The next step was to determine the main stakeholder groups of owners/developers, construction/project management, designers and contractors for each project. Twelve organisations that were heavily involved in the projects agreed to be interviewed and collectively these companies encompassed most of the main stakeholders.

Appointments were made to conduct a series of semi-structured face-to-face interviews over a period of 4 months from Sep to Dec 2012. Interviewees were selected from the top/middle levels of management in each organisation. Data

collection terminated after fifteen interviews when no new information was being disclosed and this means 'saturation' was achieved. In qualitative research, the amount of required data is not fully specified in advance and therefore data should be gathered until 'empirical saturation' is achieved; however this is not always practical (Baker and Edwards 2013). Eisenhardt (1989) suggests that the interviews should be continued until the 'theoretical saturation' is reached, that means no new observation of phenomena is added. Table 6.1 profiles the five projects and the interviewees.

Table 6-1: Case profiles

Project	Status of Project	Features	Type of Organisation	Type of Respondents Interviewed
P1	Recently Completed	8 storey residential	Developer & Project management Designer Contractor	Construction Manager Lead Architect Contract Manager
P2	Under Construction	5 Storey residential	Developer& Contractor Designer	Project manager Development Manager
P3	Under Construction	22 Storey residential	Developer & Project management & Designer Contractor	Project Manager Job Manager Construction Manager
P4	Recently Constructed	16 Storey residential	Developer & Designer Contractor	Project Manager Lead Planner Job Manager
P5	Under Construction	18 Storey residential	Developer & Project Management Contractor Designer	Project Manager(2) Development Manager Lead Architect

The interviews were structured to draw information on the following topics:

- Barriers and problems of stakeholder involvement within the planning process and design phases of residential building projects
- Approaches and factors which can lead to more effective stakeholder involvement in the project through the best decision making in the initial and planning process

6.3 METHODS OF ANALYSIS

Interview data was analysed in two steps; the initial analysis was conducted after five interviews to recognize whether the data collection was effective and conformed to the case study objectives. It also served to identify any probable missing required data in the subsequent interviews. Theoretical saturation was reached in 15 interviews as in the last three interviews many very similar responses were obtained to those in the previous 12 interviews. The qualitative analysis software 'QSR international's NVIVO 9' (2010) was used to analyse the collected data and the coding details are explained in the next section.

Coding of Collected Data

"A code in qualitative analysis is most often a word or short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language-based or visual data" (Saldana 2009, p3). Coding is a method of analysis that allows the researcher to sort out and group similar coded data into groups and categories which share similar features. The purpose of coding is to obtain, from unstructured data, a clear understanding of what the data is about (Morse and Richards 2002). Coding has also been defined as " a process that permits data to be segregated, grouped, regrouped and re-linked in order to consolidate meaning and explanation" (Grbich 2007, P21).

Some categories/sections may include groups of coded data that requires additional allocation into subcategories/subsections. Main categories are evaluated together and some are combined in different ways and then concepts and theories can be developed out of the classified data. The following diagram illustrates a basic process of how initial coding lead to concepts and theories

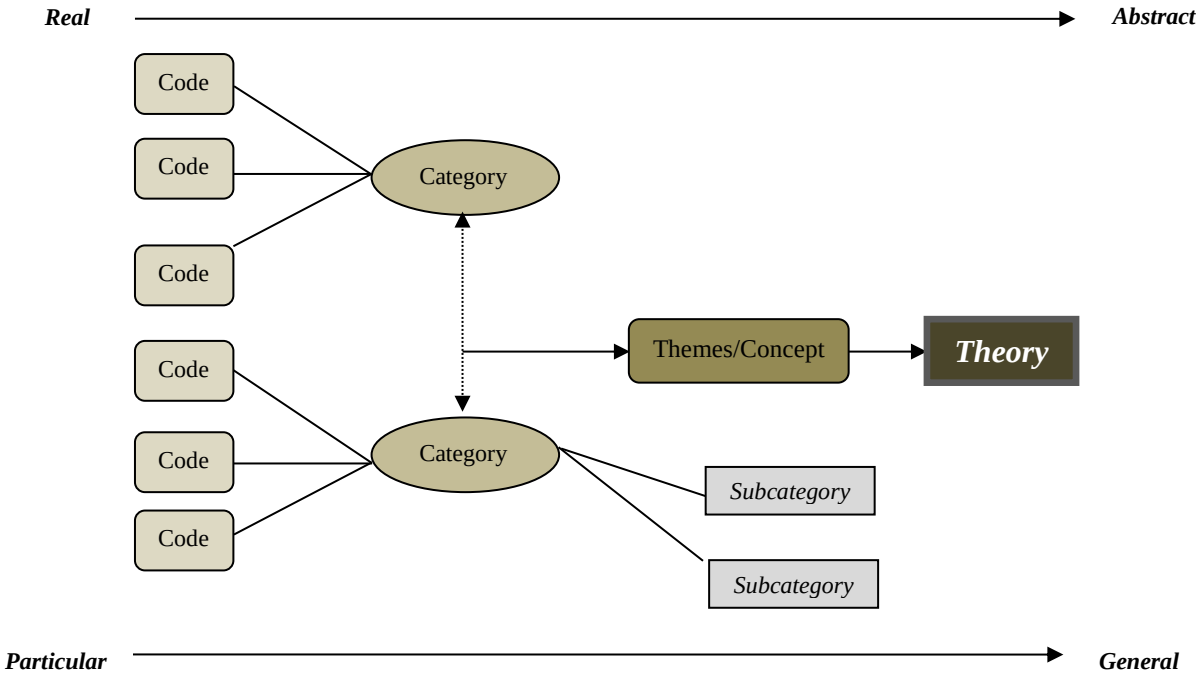


Figure 6-1: A Streamlined codes-to-theory model for qualitative inquiry (Saldana 2009)

According to Saldana (2009) coding is divided into two main parts, which are called first cycle & second cycle coding rounds. The first cycle involves those procedures that were completed in the initial round of data coding and are classified into seven main categories namely: grammatical, elemental, affective, literary and language, exploratory, procedural methods and the final profile named theming the data. Each of these categories contains subcategories of coding. The second cycle of methods includes; pattern, focused, axial, theoretical, elaborative and longitudinal coding methods. The following section explains and justifies coding methods used to for qualitative data analysis in this research.

Applied Coding Methods

According to Michael Quinn Patton (2002b, P433) "because each qualitative study is unique, the analytical approach used will be unique". Depending on the goals of each study, one coding method might be adequate to cover the essential outcomes, but two or more are required to cover the necessary processes in data analysis. At this stage of this study, the researcher needs to examine, categorise and combine evidence to provide the basis for the initial framework. For the purposes of this research, the "elemental" and "focused" coding methods were applied in the first and second rounds of analyses respectively.

The elemental coding method has been considered as one of the most important approaches to qualitative data analysis (Saldana 2009) and include further subcategories as:

- Structural coding
- Descriptive coding
- In Vivo coding
- Process coding
- Evaluation coding

The descriptive coding approach within the "elemental" category was chosen to firstly articulate the text into a broad topic area and then to generally categorise the collected data in accordance with the determined objectives of the analysis.

Descriptive Coding

Descriptive coding is appropriate for nearly all qualitative methods. This technique is suitable to be applied in studies that conduct data forms such as interviews and document reviews (Saldana 2009; Miles and Huberman 1994). This method is basically used to collect the list of topics of major categories or themes (Saldana 2009). Then the collected data needs to be generally categorised to provide the foundation to identify themes, concepts and theories. Data categorising is helpful to understand and allows researchers to come to terms with the complexity of data (Morse and Richards 2002). It uses descriptive coding as a practical approach due to the fact that "it categorises data at the basic level to provide the researcher an organisational grasp of the study" (Saldana 2009, p73). As stated by Wolcott (1994, p.55) this method "leads primarily to a categorised inventory, tabular account summary, or index of the data's contents. It is essential groundwork for second cycle coding and further analysis and interpretation" which is relevant to the purpose of analysis of this study at this point.

Initially, the sources of coding (transcribed interviews) were entered into the NVivo software and the coding process commenced. The NVivo coding process is based on storing the interview transcription text in nodes and tree nodes which allocates the text into different files for each topic (Bazeley 2007). Typically, coding

process in qualitative analysis begins with open coding that include analysing the data to explore a set of groups or categories (Fernandez 2004). However, this research specified general nodes around the framework elements; as a result some parent nodes and some child nodes were created representing the main elements of the ESI framework. Additional nodes were added when new perceptions raised form the data. Those parent nodes were created in accordance with the main objectives of the case study and to generate a structured framework around subsequent child codes. Such framing helps to gather data related to each objective in a separate node folder that enables the narrowing down of textual passages related to each specific subject. Figure 6.2 gives an example of the parent nodes.

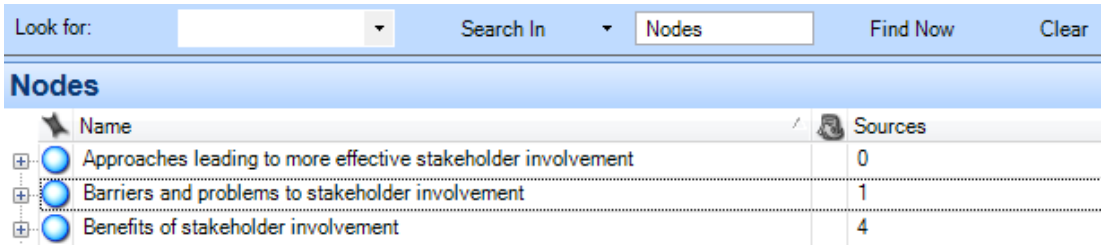


Figure 6-2: Parent nodes

The second phase of using NVivo involves precisely reading through each of the passages separately, finding relevant ideas between parent nodes and passages in order to generate more detailed subcategories. This leads to a comprehensive node structure with both parent and child nodes.

Descriptive coding is appropriate here as it helps the researcher to extract basic concepts and themes by coding qualitative data passages and provide an organised and categorised data for further analysis. The following figure shows how smaller sub- categorisations are extracted from the passages and sit under the relevant parent nodes.

Figure 6-3: Details of noding

As shown in Figure 6.3 above, parent nodes are supported by a number of child nodes and this, results in a better understanding of the phenomena of interest to the research. However, another round of coding is still required to group the similar or the same child nodes and form the final category under each parent nodes. So, focused coding was chosen to finalise the coding process.

Focused Coding

According to Saldana (2009) focused coding is particularly appropriate for a study which aims to develop major categories, concepts and themes. The goal of this type of coding is to generate categories based on properties and scope. This phase of the analysis focused on reviewing and revising nodes, their content and their chosen names. This meant that some similar nodes were merged together (because the content explained the same or a similar idea) or alternatively they need to be deleted or relocated under a different category. This process helped to create a more structured tree node which was as a result easier to analyse. The analysis process can begin after all nodes are reviewed and revised.

Interview results analysis is divided in two main sections. The first section largely focuses on the barriers impacting on, and problems of, stakeholder

involvement in the project and particularly during the initial planning process. Although this section is not specifically related to the major objective of the case study, it is included in the analysis as it provides a better understanding of the implications of the final established framework and also creates a logical relationship between the research results. This section is then followed by a comprehensive analysis of the findings related to the investigation of the approaches and elements that contribute to more effective stakeholder involvement during the initial planning and design phases of a project that result in improved stakeholder involvement throughout the subsequent project phases.

6.4 BARRIERS AND PROBLEMS OF STAKEHOLDER INVOLVEMENT

The first portion of the interview data is analysed in this section. Stakeholder involvement (SI) in residential building projects is often constrained by certain factors that may differ based on the context and circumstances of the project. Respondents were asked to provide their opinions on the problems, barriers and constraints both before, and during, their involvement with the project. The investigation starts with the analysis of those problems and barriers that hinder stakeholder's incorporation during the project process especially in those stages of project management during which quality planning and decision-making occur. Firstly, descriptive coding is applied to examine all of the important issues that stakeholders were facing before and during their involvement with the project. In the next step, focused coding is used to cluster similar issues and form more structured categories of data. In this step those issues indicating similar ideas were merged, or some irrelevant issues were omitted from nodes. Accordingly, another round of analysis was then applied to create the final 10 groups of main issues. These 10 categories indicate the major problems and barriers that obstruct the efficient involvement of key stakeholders in the planning phase of residential building projects.

Poor Commitment

Lack of stakeholder commitment has always been a major problem apparent on many construction projects. Notably, the low level of management commitment is a major concern to many parties because it is the managers who plan the main

directions for organisations, and therefore have high influence on the decision-making and other processes. Although the advantages of stakeholder commitment have been advocated by scholars (Yu et al. 2006; Jha and Iyer 2007) yet this issue continues to be a problem affecting effective SI. Responses from construction industry practitioners identified the two key following problems, which reinforce this perception:

I. Uncertainty in getting key stakeholders committed

II. Commitment/agreement deficiency for intellectual property inputs

Firstly, although key stakeholder's commitment can be highly beneficial in helping to decrease conflict, confusion and incompetency, it is difficult to ensure that all stakeholders are entirely committed to the project. This issue was confirmed by a project manager from one of the respondent contractor companies:

> *"Although getting key stakeholders commitment very early would be a positive step to improve the overall quality, it is still difficult to assure their commitment."* [P4]

Across all cases it was apparent that a lack of client commitment to the entire project process was a major obstacle in obtaining other stakeholder's contribution. One project manager raised the issue that a lack of contractual agreement being a major concern for those stakeholders who are asked to release their intellectual property (IP), especially during the early project stages. In other words some stakeholders are not keen to release their information unless they are assured they will get paid for their intellectual input throughout clearly identified stages of a project. Below are some remarks from some of the interview respondents confirming this view:

> *"The conundrum we've got with everyone being on board to start with is sometimes we're asked to get involved in jobs but there's no contractual commitment. Now we're not going to give our time and resources to something we know we're not going to get paid for".* [P1]

> *"What they (contractors& designers) don't want to do, is they don't want to give away their building smarts, their building intelligence or intellectual*

property until they have some sort of commitment from us (Client-Developer) that we want to proceed with them". [P3]

"Contractors are reluctant to give away all their intellectual property if it's for free." [P5]

These two elements indicate that poor commitment from parties with the greatest influence over projects, particularly from the client/developers, is a major hindrance to the actual involvement of other key project members and therefore these issues need to be considered and observed in management programmes and relevant commitment in decision-making should be forthcoming.

Time Constraints

Time constraints have always been a problem to the satisfactory achievement of targeted outcomes of most projects (Al-Najjar 2008). Evidence from the case study interviews indicates that many stakeholders from different disciplines suffer from time constraint pressures and issues throughout the project life cycle. However, in this research the three key time constraints were identified as:

I. Lengthy processes (especially in decision-making) due to having too much discussion and too many opinions being heard upfront in projects

II. Urgency of project implementation requirements

III. Lengthy administration approvals

Firstly, stakeholders who had agreed to get engaged in the planning process sometimes had diverse and dissimilar opinions with regard to various issues pertinent to the projects. The presence of too many differing opinions during front-end planning of projects may result in an unnecessarily lengthy decision-making process and in certain situations that project leaders create when involving several people in the initial approval and planning stages. It was reported:

"Having too many opinions up-front can actually prolong the decision making process. I suppose if you have too many people involved up front, not only is take a long time to have them sitting around the table, they're also not actually achieving much." [P4]

In addition, urgent project implementation or acceleration hinders the participation of all of the main project members in the relevant processes. For example if a project needs to be implemented urgently, there is no time for comprehensive preparation, or a wider-ranging decision-making process and for that reason SI in the early process becomes inapplicable. A project manager who has been involved in many residential project states that:

> *"Sometimes the project may just be a snap decision that needs to be done urgently and therefore there really isn't any stakeholder involvement issue in concept phase, or planning phase, or the design phase. It might just be that the works are so straight forward that there is standard design for that sort of thing and we just go straight to procurement and roll out the construction."* [P3]

Furthermore, obtaining administration approval is most often an exceedingly prolonged process. The lag in keeping to an established timeframe in obtaining approvals from the government leads to certain problems in receiving timely stakeholder inputs and information. As mentioned by a one Development Manager from a large integrated development company:

> *"I think one of the main problems with the process is probably the lag in timeframe to get the approvals as it takes quite a long time to go through state government. So it can be quite significant."* [P2]

These three elements confirm that timing problems in many cases form a large obstacle to correct and effective integration of stakeholders.

Cost Limitations

Costs are typically a decisive factor to clients in most construction project (Sunil M. Dissanayaka 1999). Kaming (1997) noted that cost issues are a major problem on high-rise construction projects. Anticipating an adequate budget and having a clear financial analysis of costs at the beginning of a project are difficult issues in most cases since certain activities that cannot be identified in the early phases of a project will ultimately impose additional costs to the project in later stages. Because of this, involving stakeholders may on certain occasions be problematic as it will have a tendency to increase the total project cost. This section

identifies the three main cost issues which hinder the people's involvement in residential building projects. They include:

I. The perceived increase to the risks of investing in particular projects

II. Unclear final profit margins

Firstly, involvement of stakeholders in many cases can become a time and cost consuming process and this might make it into a matter of conflict for clients since the more time spent in the project initial phases the more eventual project cost is imposed on them. This issue can increase the investment risks and also reduces the final achieved profit margin. Because of these, project leaders and owners are less interested to involve other stakeholders during the approval, planning and quality planning stages. According to one lead planner:

> *"The client is paying all these people to do things and until something actually gets built and he can sell the things, or settle on the apartments, he doesn't get any money for this so he's going out on a limb. So he (client) wants to spend as little as possible early in the process and obviously by the end he's spent an amount and so he wants to get the maximum bang for his buck at the beginning and engaging a whole lot of people is probably is going to cost him more money that he (client) might not be very keen on."* [P4]

Additionally, evidence supports that most clients and developers want to pay the smallest amount of money early in the project as they still have not reached to the project sale point and their initial anticipated profit is still unclear. One of them declared:

> *"In the residential space mostly, a developer would have their equity, their own money and not the bank. The bank's money hasn't come into play yet. So, they will want to have as few people involved in that process as possible."* [P1]

A lead planner from a large integrated development company pointed out that clients are unwilling to pay so much money early in the project, because they want to capitalize on the final benefit. He states:

"The issue then is that the client has a reluctance to pay for intellectual property information coming from contractors because they're trying to maximise their profits." [P4]

Overall, the data provided evidence, which suggested that serious efforts need to be applied towards improving cost limitations which is a major barriers to efficient stakeholder incorporation and to contribute to more effective early participation of key project members.

Lack of knowledge/Information/Identification

Knowledge is noted as one of the most significant resources contributing towards effective managerial decision-making and extending the competitive advantage of organizations implementing construction projects (Carrillo 2004; Nonoka and Takeuchi 1995). However, poor knowledge and information transfer is still a major problem and this is a critical barrier to the correct assessment of stakeholder's proficiencies, resulting in many other failures in projects where this is an issue.

This issue of lack of awareness, and of knowledge, can be classified into two main categories. First, there is the project leader's poor knowledge and information about key stakeholders (including individual owners and clients) and secondly, the low level of key project stakeholder's (including clients/owners) knowledge about various aspects of the project and its partners. Such knowledge issues still exist in the industry (Olander 2006) making it very hard for the project manager and project leaders to properly analyse their own, and other stakeholders' impact on the project. The importance of the client/owner as a major stakeholder has been considered by many scholars (Newcombe 2003; Olander 2007) and while a low level of client knowledge and information can negatively impact the project and its stakeholders, improving their knowledge will contribute positively to the entire project process. The current research combines these two issues and identifies the three factors which signify the main problems and barriers within the knowledge/awareness category:

I. Poor identification of key stakeholders including clients and final customers

II. Lack of knowledge about stakeholder groups and their expertise

III. Insignificant knowledge about the project and client unfamiliarity with project requirements

Evidence highlights that if an organisation has not accurately identified key stakeholders, it is then very difficult to subsequently involve them into the project management process and consequently the project team cannot respond to their needs and expectations correctly. Depending on the size of the project it can be worthwhile to identify and involve individual owners, or final consumers, who are going to take advantage of the handed-over project, and collect their expectations during the early decision-making process. However, in many cases this issue is not considered by project authorities at the appropriate time thus resulting in certain problems in terms of meeting the customer needs and expectations. As noted by a manager:

> *"It is hard thing to design something for an owner that you don't know and you have had no experience with. Renters have some characteristics that you can accommodate but individual owner is a different scenario, it is unfortunate that you can't get them in the process because you have not identified them."* [P2]

The second issue is around the problems associated with low level of information about the groups of stakeholders working in the market. For example, if project leadership team does not acquire adequate and correct information and knowledge about key stakeholders groups and their expertise, it is then difficult to identify, involve and collaborate with those who have experience relevant to their project specific requirements. Such an oversight will lead to the inability to involve main stakeholders at the most appropriate stages of the project. A project manager reinforced this issue and commented:

> *"Sometimes project owners and clients don't look at the market place to find out who is doing what. As long as they don't know who are good in the market, they can't neither identify them nor work with them."* [P5]

Moreover, insignificant knowledge about the project and its objectives is for the most part an obstruction to SI. It also produces certain problems even after stakeholders are involved. The following statement from one project manager highlights this:

> *"Unfortunately a lot of people who do the investing or who are the clients especially in our area (residential building), have very little knowledge of what they're doing."* [P3]

The similar issue indicated by a manager confirmed that a significant problem arises when clients are not exactly aware of what they want and since there are many key stakeholders engaged by the client, it results in difficulties in efficient cooperation of stakeholders within the project. He noted:

> *"Some clients may have a very strong view about what they want their product to be, but some others don't exactly and this is when the problems come out."* [P1]

Besides, the research data confirms that many clients are suffering from unawareness and unfamiliarity about different project aspects, and so this issue continues to be a problem in the residential building sector. From the perspective of an experienced construction manager, lack of client awareness negatively affects the project. He commented that:

> *"Absolutely where the project falls down is where you've got an owner, who doesn't understand the industry and they think, as you would on paper you shouldn't need to employ a project manager because the architect and engineer should do everything right but you know as we know that doesn't happen."* [P3]

Hence, if clients are not fully aware of different aspects of their projects in terms of characteristics, objectives, required budget and tasks to achieve high margins of profit, it surely leads to a certainty that problems will arise. Some clients, because of their poor knowledge and unfamiliarity with project implementation process, cannot contribute positively. They sometimes are reluctant to involve the essential groups of stakeholders because of their own unawareness of project requirements and the stakeholder's actual specialities and expertise. Such ineffective treatment can pose different types of risks and disadvantages such as misunderstanding the process and unproductive relationships (IFC 2007). A construction manager shared his view on this and noted:

> *"Absolutely where the project falls down is where you've got an owner, who doesn't understand the industry and they think, as you would on paper you shouldn't need to employ a project manager because the architect and engineer should do everything right but you know as we know that doesn't happen."* [P3]

All of these factors above confirm that a shortage of information and knowledge about different groups of internal and external stakeholders will clearly lead to inadequately identifying them, and for that reason, poor incorporation with them will certainly results throughout the project. For a client/owner, it is not just possible for them to know everything about the project, but they need to at least have enough knowledge regarding the most significant project issues (such as the importance of effective SI), which will have a major impact on the subsequent project outcomes. So there is an imperative responsibility for other professions involved in the projects to fill in those knowledge gaps.

Confusion

Across all of the case study interviews the issue of confusion was investigated as it seemed to be a general problem that occurred as a result of attempting to integrate too many participants upfront in the project. Some of these problems occur after stakeholders are involved, while others occur as barriers against greater stakeholder engagement. The analysis identified the two main issues as:

I. Changing the strategic project direction and creating confusion
II. Competition amongst the main stakeholders' objectives

There are situations on projects according to interviewees where despite the efforts to demonstrate the benefits of stakeholder integration, diverse expectation and various interpretations of project aims creates a controversial situation which results in some level of confusion of what really client wants to attain. The following statement by a project manager shows this concern:

> *"Having too many opinions up front can actually confuse what the client is trying to achieve."* [P1]

Moreover, engaging many opinions in the early phases may mislead the project direction. It is recognised that different stakeholders can have different approaches and various objectives and that can change the initial project path. A development manager discusses that there might be a change to the original project direction, so the client might get confused about the main project objectives. She commented:

> *"If you have too many people involved up front, you might not actually achieve much, or anything, given that group may say no, steer the client in a different direction."* [P2]

Competition amongst the main objectives relates to stakeholders from different disciplines following various objectives in order to secure their requirements, goals and finally the desired benefits. So, very early interaction with them sometimes leads to a rather contentious competitive environment that needs to be carefully managed. Competitive objectives may persuade proponents to adopt quick and unreasonable approaches. A knowledgeable manager explains this issue:

> *"I think it is difficult, because the more people you have, often they are competing objectives, so obviously that is something that needs to be managed."* [P4]

In summary, the two identified problems in this category clearly show that involving many people early in the project will result in releasing of diverse opinions upfront and this needs to be very well organised, otherwise the resultant confusion or altered strategic direction of projects can negatively influence achievement of key project goals.

Losing Competitiveness

Engaging main stakeholders so that valid competitive business environment is protected is key at the initial stages of projects (IFC 2007). However, this process requires very careful management since involvement of many stakeholders can sometimes lead to certain problems in terms of losing competiveness. From the interview analysis the two major issues were identified as:

I. Decreasing competitiveness edge

II. Increasing the risk of non- truthful bidding

The key tactic at the initial phase of a project is to involve potential stakeholders whilst maintaining the competitive business interests. Nonetheless, interacting with key project members and particularly contractors in the very initial stages might result in losing the competitiveness during the tendering process since it can create a misconception among them that they have already been pre-selected as those who will be finally undertaking the construction phase. The following statement shared by a manager highlighted this concern.

> *"If you start bringing builders in early you lose your competitive edge. So the problem is if you start negotiating the project straight after you've got a DA it's good on one hand but then you stuck with the builder."* [P5]

In addition, including designers and builders, in the very early stages of a project and especially selecting them (without any competitive tendering process) to undertake the project up to the final design and implementation phases makes it very hard to measure and determine whether the most reasonable price has been obtained, or not . In such cases, project leaders have to limit this loss of competitiveness by allowing the opportunity for other stakeholders to offer their services and fees and this will dramatically decrease the risk of non-competitive and inaccurate tendering. However on the negative side, adoption of such a method may encourage selected stakeholders to adopt cheap and unreasonable approach to keep the tender as low as possible. The following quote from a contract manager highlights this issue:

> *"The issue that comes up in that type of scenario is that the client usually would like to get, would like to have some certainty that he's got a competitive contract or he's going to get a competitive price for the construction of his project. So if he puts a builder on very early in the planning phase how does he measure that the contractor that he's putting on is going to give him a competitive price."* [P1]

The two issues point up that involving main stakeholders and particularly contractors, in the initial stages of the project is not a simple issue and needs serious upfront considerations as it might result in unwanted cost issues or affect profitability down the track.

Lack of Experienced, Skilled and Right People

Getting the right (and knowledgeable) people involved at the right stage in a project has always been challenging and often becomes a major barrier to the successful implementation of the project (Olander 2007). The "right people" here refers to the people with sufficient knowledge, skills and capabilities. Dainty (2004) reveals a number of factors , that have resulted in skill shortages in the past few years in the construction industry. They include deprived representation of industry, the opening of novel technologies which have formed the new skills required, high growth in self-employment and the use of "labour-only sub-contractors", which remarkably have reduced the commitment and consideration in training within the industry (Harvey 2001). In line with these views, interview analysis identified that two major problems resulting in an ineffective SI were:

I. Lack of skilled, qualified and experienced people

II. Assigning people to an irrelevant (incorrect to skill) position

Firstly, in most cases, regardless of the position or the role of internal or external stakeholders, it was found that involving people with the no or limited skills and competency would not be operative. This problem was articulated in the interview with one project manager who insisted that the right people are an important factor towards a satisfactory project progress and highlighted that many subsequent problems happen due to the lack of a fully qualified project team. He added:

> *"Poor availability of the experienced human resource makes many problems for all parts of the project."* [P3]

Across all cases the importance of the role of project members was indicated and it was noted that poor consideration resulting in engaging non-skilled practitioners will impede the whole project delivery process. Even if a good project management system exists, without having qualified and expert people, the project is unlikely to achieve the ultimate satisfactory and expected outcomes. When asked to enumerate the barriers and problems of stakeholder involvement two respondents stated:

"You can have top project management systems in the world, but if you don't have the best, most knowledgeable and most professional people in the world they're never going to work for you." [P3]

"No more so than getting the right people in the team." [P5]

Moreover, not assigning people to the right position and at the relevant stages in the project can becomes a problematic issue. For instance, even if the personnel have enough knowledge and experience in the field but they are engaged in the wrong position that is not appropriate to them, their productivity and efficiency would be dramatically decreased. Such issues were considered by a project coordinator to be one of the main obstacles to people involvement and he noted:

"The biggest barriers I find in our industry or the biggest barriers in any process are getting the right people involved in the right position." [P5]

All of the above evidence supports the finding that involving the right people, and team-members is very critical in the residential building sector and poor selection is identified as a major barrier/problem impacting on positive SI.

Project Complexity/Innovation

The construction industry, during the past recent years, has faced remarkable technological growth in many areas of operation, including buildings; this has resulted in a growth of more complex and multifaceted projects. Against this, improvement in knowledge, skills and tools to adapt to the situation using new innovations and technologies have emerged at a much slower pace and these development growth levels have created various issues and barriers to efficient stakeholder involvement with many projects. This research has identified the following two major issues:

I. Lack of adequate intellectual property for complex projects
II. Greater complexity in design

Different projects have different levels of complexity. This issue becomes more apparent in large projects as they have higher degrees of complexity in terms of more environmental and sustainability demands, more construction and safety

regulations and new construction techniques. In addition, if a project has high level of complexity and needs greater innovation, there is less opportunity to find and involve stakeholders who have the relevant experience and intellectual property. A lead architect explained the issue as:

> *"Certainly if a job has a level of complexity or innovation, for example logistically difficult for some reason, then it is difficult to find the company who might have that intellectual property."* [P1]

Moreover, design complexity is another problem which decreases the level of interaction of stakeholders with contractors, and to some extent clients. Complexity in the design and drawing will require builders possessing advanced levels of interpretation and implementation skills, and finding such contractors who can provide the right kind of possible solutions is often time consuming and difficult. This opinion was supported by another respondent:

> *"There is no point in designing a beautiful building you'll win a lot of awards for but it will never be built, because it is not easy to find a builder who can guarantee to implement what is exactly on the drawings."* [P2]

Complexity in design not only hinders effective involvement, but it also increases the price of the final constructed project and as many clients have a limited budget geared to existing normal building costs, any increase in the price to meet greater complexity demands will lead to other execution and commissioning problems. Therefore, project managers and owners need to generate approaches and make decisions to negate the barriers to greater SI resulting from project complexity.

Cultural, Legal and Political Constraints

Among those major overriding and consequential problems which need to be considered at the beginning stages of project, cultural and political issues are often high on the priority list. Such issues can directly or indirectly impact the project and its stakeholders. The culture of "people involvement" in decision making is at a minimum level in some areas (Hughes 1998). In some cases SI is assumed as a risk to the project and the project leadership group try to avoid it. Political constraints are often also a matter of conflict that will involve certain stakeholder groups especially

at the strategic levels. As identified in this research, cultural and political problems are mainly the results of two following key factors:

I. Lack of the 'right' culture

II. Difficulties with political uncertainty

Cultural issues basically are those related to the human nature of individuals in organisations (or in this case project teams) and in some cases are a confronting issue and a real barrier towards people's full-bodies interaction and engagement with the project. There may be a low tendency to collaboration due to the traditional attitudes prevalent amongst players; sometimes this disconnects the parent company of the project from the other key stakeholder groups. A project manager elaborated on this as follows:

> *"I've got to say most of the barriers of involvement are either they're either people driven, not the right people, not the right culture."* [P3]

Furthermore, political constraints normally are sometimes associated with major external organisations that might have an immense impact over the project, such as government regulators, local communities, etc. A project coordinator when asked to explain the major barriers to stakeholder engagement stated:

> *"I'll start higher at a macro level it's political. We're always challenging the planning barrier or the planning scheme. So we're always challenging for innovative building solutions so by doing that there's a political risk which we need to overcome."* [P5]

But despite this, many companies still give less consideration to the needs and requirements of regulatory organisations than they should and just try to make sure that their strategy to involve stakeholders at least meets their essential obligations.

> *"Not being updated about the recent rules and regulations might create some other problems in terms of incorporating with the stakeholders later in the project."* [P1]

In some cases the important strategic decisions are often settled by the government authorities during the strategic planning stages, prior to the engagement

of any representatives from the private sector. In this case, interacting with stakeholders from different disciplines and taking advantage of their inputs would assist government planners to provide a more comprehensive project plan, which would include a variety of useful inputs. Learning to communicate with government organisations can be a valuable opportunity for project leaders to collaborate in the high level decision making process. However, in certain circumstances legal and political matters limit engagement of other key stakeholders in the strategic planning phases of the project and this requires special consideration and action by the project management/leader group to resolve such issues.

Summary of the first round of analysis findings

This section has reported the findings from Stage 1 of the interview analysis. The findings from this analysis are a continuation of, and addition to, the first section of the survey analysis, which from the examination of the survey results, revealed that problems/barriers exist that hinder stakeholder involvement during different stages of the project and particularly in the initial planning phases of most projects. The next step (this current section of the interview section of the analysis) is necessary to investigate, identify and more deeply understand those problems and barriers before proposing solutions to improve effective SI. Therefore, the major problem categories, barriers and constraints against SI have been identified and classified into 9 main groups. The following table provides an overview of such categorisation.

Table 6-2: Summary of SI problems/barriers

Name	Category of problems/barriers	Problem Statement
Category1	**Poor Commitment**	Poor commitment particularly from the client/developers side who possess major influence on the project, is a hinder to the effective involvement of other key project members and therefore these issues needs to be considered and observed in the management program.
Category2	**Time Constraints**	Time constraints in many cases are big obstacles affecting correct and effective integrating of stakeholders and this requires a genuine consideration by the project leaders to improve those barriers and provide the situation for better involvement.
Category3	**Cost Limitation**	Serious efforts need to be taken to improve cost limitations which are major barriers to efficient stakeholder engagement.
Category4	**Lack of knowledge/information/identification**	Lack of information and knowledge about different groups of internal and external stakeholders will clearly leads to inadequately identify them and for that reason poor interaction with them throughout the project. For a client/owner, it is not just possible for them to know everything about the project, but they needs to have enough knowledge regarding the significant project components (such as the importance of effective stakeholder involvement) which have major impact on the outcomes.
Category5	**Confusion**	The two identified problems in this category shows that involving many people early in the project can result in releasing of diverse opinions upfront and this needs to be very well organised, otherwise can negatively influence on key project goals.
Category6	**Losing Competitiveness**	It is not that simple to involve main stakeholders and specifically contractors to the initial stages of the project because if the competitiveness issues and this limitation can results in certain troubles
Category7	**Lack of Experienced, Skilled and Right People**	Lack of 'right' and 'knowledgeable' individuals and stakeholder groups is identified as a major barrier/problem affecting project member's participation. It is therefore suggested that leaders should put serious attention to achieve improvement in these problems.

Category8	**Complexity/Innovation**	Project complexity issues not only hinder effective stakeholder involvement, they also increase the price of the final constructed project. As many clients have the limited amount budget, any variation on the original estimated price will lead to new problems.
Category9	**Cultural, Legal and Political Constraints**	In certain circumstances legal and political matters limit engagement of other key stakeholders in the strategic planning phases of the project and this requires essential consideration by project management/leader group to resolve such issue.

6.5 ELEMENTS FOR EFFECTIVE STAKEHOLDER INVOLVEMENT

The previous section identified the problems with, and constraints against, the involvement of different stakeholder groups during the initial stages of project lifecycle (PLC). The major stakeholders that this study focuses on are owner/developer, project/construction management, designers and contractors companies. In the previous section (6.4), problems are classified into nine major categories in a bottom-up approach. Subsequently the related problems were grouped and aggregated to the next level. Once a given group of problems/barriers has been combined to an upper level, the subset components are analysed to ensure that all of the important controversies have been included.

Following on from the results of the previous section, this section (6.5) attempts to bring together significant evidence and the approaches suggested by the interview population (high level practitioners), to improve the engagement and involvement of a project's main stakeholder groups. The logical relationship between the suggested approaches and the expected improvement levels in both stakeholder involvement and resolution of quality issues/problems will be fully argued in the discussion chapter (chapter 7).

A wide range of elements has been proposed to improve stakeholder involvement (SI). This part of the analysis collects and examines those factors and then group similar data to form a larger category of nearly identical, and related perspectives. These categories will then be analysed in more detail and compared and examined along with the results from the previous survey analysis. The Effective Stakeholder Involvement (ESI) framework of eight categorical and corresponding

elements will be presented. The use of this framework will lead project managers/leaders/teams towards a more effective approach to stakeholder involvement on projects and should result in a high level of improvement of identification and resolution of quality issues and problems.

6.5.1 Basis of Involvement

The ESI framework consists of two main parts, namely the '*basis of involvement'*, and the '*mechanism of involvement'*. The first part (basis of involvement) comprises the three main categories and their corresponding elements and these require to be fulfilled successfully by project leadership and management team before the second part (mechanism of involvement) can effectively be executed. The first part is more strategic as it provides the fundamental management elements to set up the successful implementation of the second part, hence a capable management system is required to significantly plan and implement this part and its corresponding elements. The second part of the framework consists of five main categories and associated elements that mainly focus on the mechanism of involvement and this part proposes practical approaches, which can maximise the effectiveness of the stakeholder involvement process. Although the first part of the framework produces a basis for the implementation of the next part, if the elements associated with the second part are not fully understood, designed and executed, accomplishment of the final framework objective (which is to improve SI) would become very difficult. Figure 6.4 illustrates the conceptual design of the ESI framework and the following sections provide a detailed explanation of the model.

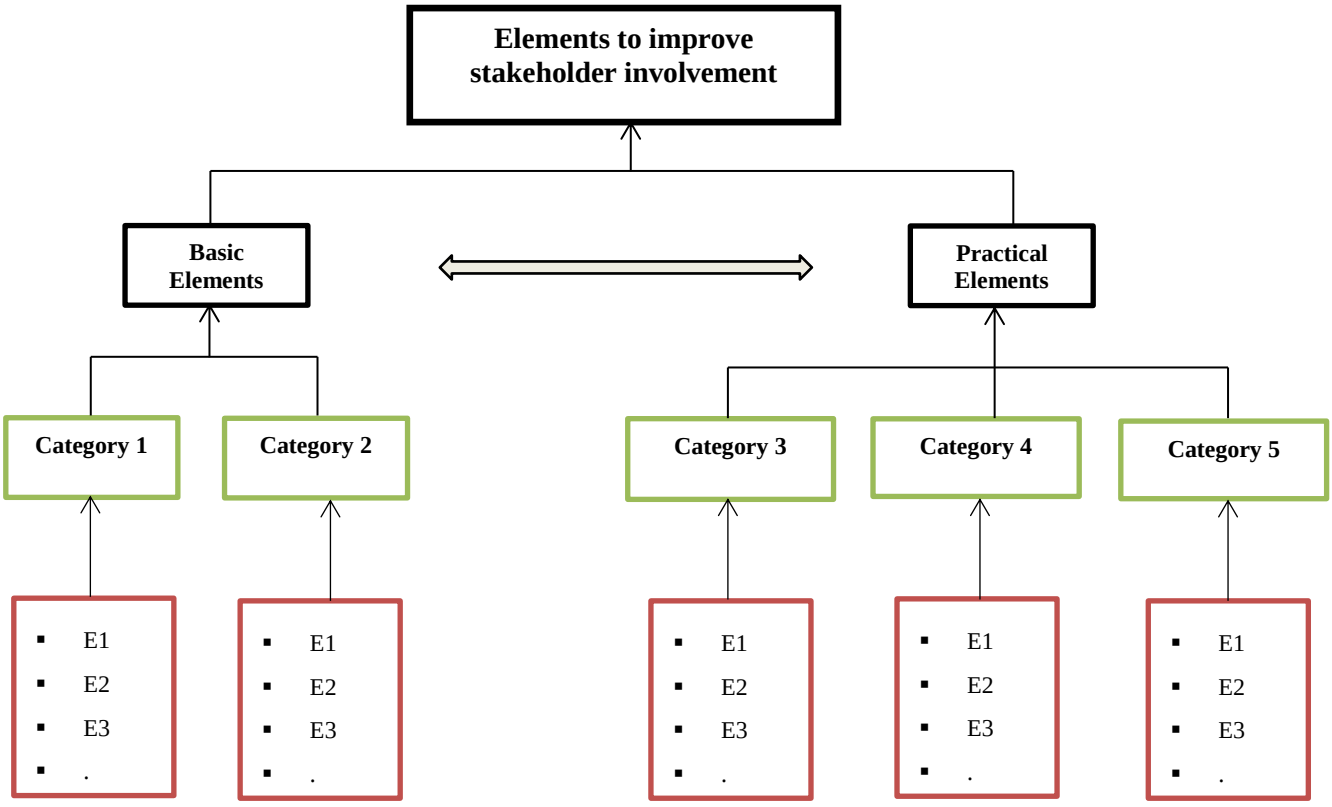


Figure 6-4: Conceptual design of ESIF

Category 1: Identification

Stakeholders in the construction industry include a wide range of entities and their inclusion and involvement either directly or indirectly can provide support or resistance to accomplishing project objectives (Walker 2000, 20). Adequate and accurate identification of relevant project members is a priority in the early planning process. Although the term 'stakeholder' has been generally defined by many scholars, when faced with the practical situation of how to define the relevant stakeholders for a particular project, these definitions are not very useful (Sharp et al. 1999). Responses from construction industry practitioners have been collated into the following five key factors, which signify the initial steps to enhancing stakeholder involvement:

1. Understand the market needs and based on that decide and choose project (BE1)

2. Identify all relevant stakeholders including individual clients and collect their needs (BE2)
3. Identify project objectives, needs and requirements and clarify them to key stakeholders (BE3)
4. Recognize gaps and constraints against stakeholder involvement (BE4)

Firstly, the project leaders and decision makers need to conduct a comprehensive investigation to fully understand present market demands and requirements, and then based on that they can decide on, and select, the project type and features. Meeting market demands allows them to develop projects according to the customer needs and this enables them to sell their properties in a shorter time and achieve their benefits faster. Additionally, the process of stakeholder identification becomes easier once the targeted projects are known, as this provides a clear view of which groups of stakeholders should get involved in the selected type of project. Below are some remarks from the interviewees:

> *"We (developer) should look at what the market dictates and what the market wants. So we need to have the people to do the research on the market."* [P5]

> *"So we (project management group) need to have good marketing people that know and can give us a good guidance on what project we are selling, what features are required in the project."* [P1]

The next element (BE2) indicates that as an initial step relevant stakeholders should be systematically identified prior to their involvement. Different stakeholders can have different impacts on project outcomes and the responsibility of the project leadership team is to clearly identify and focus on those with the greatest influence on the project. One of the project managers explained:

> *"You should know your contractors, your suppliers, consultants etc. You've got to correctly identify people who will interact with the project as early as possible."* [P2]

Incomplete identification of stakeholders in the commencing project stages will have a high probably to result in certain problems in the later phases. Since each

project is "unique" (PMI 2008b; Olander 2006) and "temporary" (PMI 2008b), it contains particular circumstances and therefore requires specific stakeholders. This highlights the need that key members of each project should be fully recognised and their requirements should be comprehensively considered and collected as early as possible. One job manager confirmed:

> *"Stakeholder mapping as early as possible in the project will assisst the organisation to assess their potential influences on the project as well as fill in probable gaps in the future."* [P2]

In fact the power of stakeholders is to control the project as they have the necessary resources and required information (Pajunen 2006):

> *"stakeholders having the needed resources and able to control the interaction and resource flows in the network most likely have a strong influence on an organization's survival. The identification of such stakeholders thus becomes an essential function for an organization in crisis"(Pajunen 2006, p.3)*

Following on from the identification of the potential stakeholder groups, project leaders and managers should identify, classify and document a clear set of strategic project objectives, needs and requirements. Such documentation should be clarified to final key stakeholders once they are approved to be involved in the project. Two project managers believed that:

> *"You need to have a framework, like a system that you can assess the requirements of a project from beginning to the end and I think there is a need in having relevant stakeholders up early to understand what the parameters are around, what you're doing and setting an agenda that moves the whole thing forward so that key decisions by those stakeholders are made early so that everybody is on a common path moving forward to an outcome."* [P4]

> *"You (owner and project management team) need to very well define project needs, requirements, objectives, resources, risks, etc. So with that as I said you need someone or a group who can look at a project and analyse the*

information that's on different project phases and everything else that goes with it."[P5]

The next element (BE4) facilitating the involvement of selected participants is to identify the available gaps in the project stakeholders' engagement and provide an appropriate methodology to 'fill' such gaps (such as differing motivations and rationales for participations). This step is critical because even if those stakeholders have been correctly identified, there will be less chance of improving stakeholder involvement unless the decision makers are completely familiar with any involvement gaps (deficits). This idea is supported by one manager who observes:

"The project management group and any group in charge to plan for the project, should clearly identify stakeholders and recognise the available gaps to their engagement, before taking further actions."[P1]

These four elements (BE1- BE4) all indicate that a clear understanding of the market demand and accordingly select the type of project, identifying all potential stakeholders and clarify available obstacles and barriers to their involvement are the key approaches that can significantly contribute to the enhancement of effective stakeholder involvement into the initial quality planning stages of PLC. Figure 6.5 presents these four major elements that constitute principle identification.

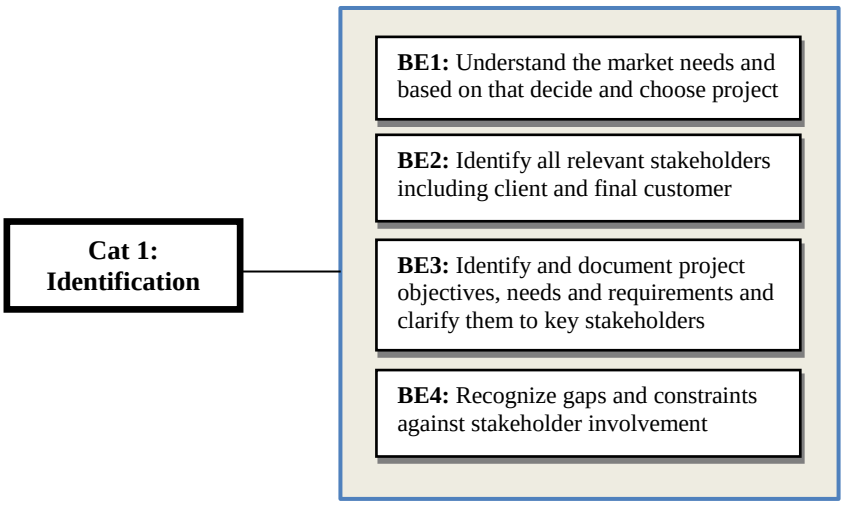


Figure 6-5: Elements contributing to 'Identification'

Category 2: Information

In the construction industry, obtaining accurate, precise and adequate knowledge and information about a project, including all of its diverse traits, the different project partners, peoples' capabilities, rules and regulations, etc., is a challenging process (Yang 2010). The subsequent step after identifying the important project elements is to obtain accurate, correct and timely information required to successfully plan and design for SI. The process of obtaining information and knowledge can be classified into two categories. First, is the project leader's knowledge about key internal and external stakeholders (including company's internal key members) and their proficiencies, skills and experiences and second is the level of key project stakeholders' (including clients/owners) knowledge about the important project objectives, needs and issues. The data gathered from respondents, emphasises that obtaining correct and complete information in the initial planning processes will result in more accurate decision making and finally will contribute to more effective involvement of the project's major stakeholders. The two main elements involved in the second step to improving stakeholder involvement were identified as:

1. Obtain correct and complete information and knowledge about internal and external stakeholders capabilities and skills (BE5)
2. Key stakeholders including clients should attain enough and correct information about project and its partners, objectives and issues and expected profit (BE6)

The first element (BE5) in this category indicates that collecting a complete set of information and obtaining knowledge about key project stakeholders will enable project leaders to make appropriate and realistic decisions. Such information should accurately illustrate the level of skills, experiences and capabilities of targeted stakeholders and that can be achieved by means of conducting an inclusive market analysis. Furthermore, internal project team members such as the heads of divisions, people who work at the management level and others active in the project implementation process are important people who can positively contribute to the project. Therefore, organisations should develop a broad understanding about those

internal project members as an important part of information on the entire project team. The following views from two project managers evidence this:

> *"One of the first things to improve people engagement is about getting to know all the people in the team, getting to know their knowledge, personality, etc. I guess that in a way is when you really maximise having a good framework, a good system, a good process but then not just relying on the process alone. Relying on the management, the skill of the people managing to identify what are people's traits?"* [P2]

> *"So you need to understand who your partners are but also your consultants, builders and designers. It's very important to understand who they are, what projects they've worked on, what skills they have, how well they cooperate with the other consultants, how well they get on with builders and all those sorts of things."* [P3]

Moreover, successful completion of the project largely depends on meeting the needs and requirements of the community of all key stakeholders including clients. Across all cases it was apparent that the project managers should systematically manage client involvement in the entire planning process. A lead planner highlighted the fact that *"Clients have the ultimate control on what is happening in the process",* and therefore it is necessary to make sure that they are fully aware of different project processes, requirements, and outcomes. A similar idea was pointed out by another interviewee:

> *"Well directing the project is the most important thing and that proper management has to come from the clients. So they should engage with the project manager and other key groups of stakeholders to collect all the relevant information about the project before going into the process."* [P5]

It is sometimes challenging and time-consuming to build up a relationship and provide complete significant information to the client, but in the view of one experienced construction manager it is an important part of the initial project stages and should be implemented effectively by the people in charge of the project. He also adds:

"They (Clients) need to understand the process, what their contribution to the process is, what they will gain in return. What influence they have during the delivery process, they need to have confidence that the people managing the project are capable and that there are good processes in place." [P3]

Both of these factors confirm the importance of achieving accurate and timely information about the project and its community of stakeholders as the initial steps in early project phases and also accurately communicating such information to key participants can certainly contribute to their effective involvement. Figure 6.6 shows the two elements (BE5, BE6) in this category.

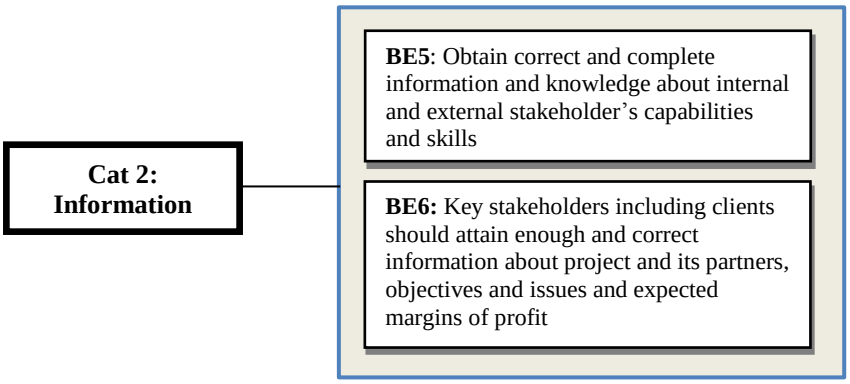


Figure 6-6: Elements contributing to 'Information'

Category 3: Evaluation

Previous categories discussed the significance of identifying project, its need and objectives, potential relevant stakeholder groups and recognition of SI gaps and constraints. Attain correct and inclusive information about project and its main community of stakeholders was also highlighted as an important step towards enhancing SI.

There is evidence from the research data and the literature that in the subsequent step obtained information should be assessed and evaluated to provide an accredited basis that can facilitate project leaders and managers to select and involve appropriate parties. According to Johnson and Scholes (1999a), stakeholder identification alone is not adequate and project managers and owners need to take the next step involving evaluation of stakeholder needs, requirements and expectations. Clear evaluation of project and stakeholder needs will also help authorities to modify

or update their project decisions. Responses from construction industry practitioners have been collated into the following three key factors in Category 3:

1. Assess key stakeholders (including client and customer) needs and enhance reasonable and mutual expectations (BE7)
2. Evaluate the market place to find appropriate stakeholders (BE8)
3. Assess the degrees of key stakeholder group's specialities and involve those with relevant intellectual properties that can fulfil your project specific requirements (BE9)

Changes and variations, in many cases, impose additional cost to the project and the cost of change increases as the project moves forward (Al-Najjar 2008). Similarly, any changes or variations in stakeholder's demands and expectations can result in extra costs, especially if they occur in the finishing project stages and therefore key stakeholder's needs, requirements and expectations should be assessed as early as possible in the project. One project manager suggested that "*it is important to have a clear assessment of key stakeholders needs and expectations in early phase"*. Different stakeholders can have dissimilar objectives and so their needs and requirements can vary. It is therefore the responsibility of the leadership group to assess each stakeholder's dominant requirements, examine the rationality and viability of those requirements and to develop a mutual and realistic set of expectations that can be effectively met and by so doing achieve main project objectives. Below are some remarks from two interviewees:

> *"I think assessing the expectation amongst everyone including the client as to what they're actually going to get at the end is one of the important things that we should do."* [P1]

> *"It is necessary to have realistic requirements in the project brief and doing everything in a reasonable time, to a reasonable budget that everybody has agreed on and everybody's expectations are the same. Each stakeholder has reasonable expectations and then if you can get that right then you can cure a lot of problems."* [P4]

Finding all appropriate stakeholders may be a challenging issue. The analysis shows that project managers need to research the market in order to find companies with relevant expertise to fulfil their specific project requirements. The process of selecting and involving stakeholders is made easier and more efficient, when the decision makers have a complete database of all of the available stakeholders, their fields of work and the level of their expertise. A manager who had many years' experience working in the industry stated:

> *"I guess they (project owners, and managers) should look into the marketplace and find out who's doing what. I want to deliver this project under design and construct terms. Who is a good design and construct builder in that residential market right now? Get them involved and in the multi-residential space it's largely private organisation so they use that approach."* [P3]

The third element (BE9) of the 'evaluation' category highlights that different companies have various specialities and technical expertise. For example, an organisation may be specialised in designing detached houses, while another company can have valuable expertise in designing or implementing high rise buildings. Evidence suggested that in order to involve stakeholders effectively, a thorough examination of their technical skills and expertise should be undertaken as part of the initial decision making process. The data supports the view that the project leadership group should engage stakeholders with related expertise for the targeted work, particularly on large building projects. However, in the view of Kazaz and Birgonul (2004), the residential sector is still suffering from the lack of adequate project members' knowledge and experience. The following statements from one project manager and one lead architect support this approach:

> *"You (project owner/manager) should find out who is doing what. Assess their abilities in a certain field of work and then choose the most appropriate one."* [P2]

> *"The key thing is to evaluate stakeholder's capabilities and then involve qualified stakeholders. Getting the high quality builders, getting the right consultants and designers and putting together a thorough recommendations and make sure that they're the right people for the job."* [P5]

In addition, the level of competence and skills of internal project members, especially those individuals who are being considered for strategic and management positions, should be correctly evaluated. As these people will continually be engaged in the important decision-making meetings, they will have critical positive or negative impacts on project issues and progress. Across all cases, the significance of having knowledgeable people at all levels of the project was advocated by many respondents:

> *"You can have the best systems in the world but if you don't have the best people in the world they're never going to work for you. So you need to surround yourself with some good people and knowledgeable people."* [P1]

> *"I guess assessing level of people's competencies and involving skilled people, people with skills, people with experience, solves a lot of problems."* [P4]

> *"The bottom line in the success of any project is about the people."* [P5]

All three elements (BE7, BE8, and BE9) confirm that an important step in the enhancement of effective involvement of the main project members is for them to have a logical and practical assessment of diverse projects and the typical stakeholders' requirements for such projects, as well as a clear assessment of the market to choose the most suitable companies competent enough to meet project objectives. In order to minimize cost and the risk resulting from changes in a project, the leadership team together with representatives from other key stakeholder groups need to consolidate the main expectations and attempt to establish mutual and joint demands. The following figure profiles the three key elements in the evaluation category.

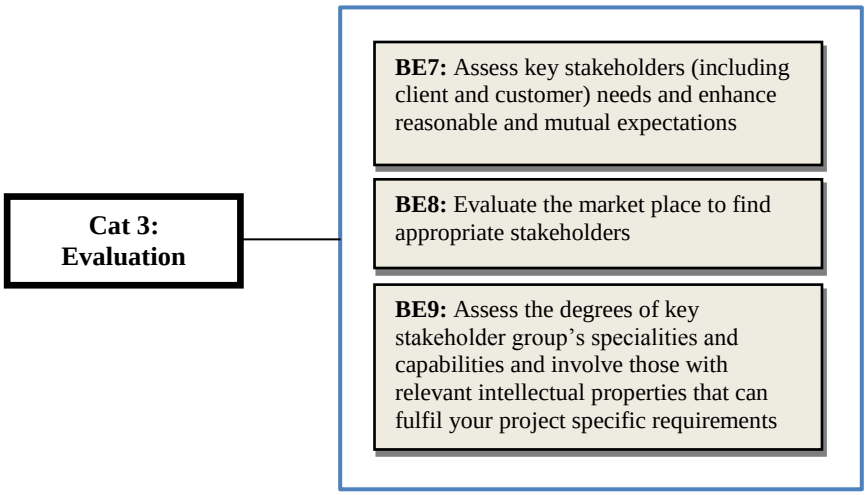


Figure 6-7: Elements contributing to 'Evaluation'

These previous sections have explained in detail exactly how the three categories of "Identification", "Information" and "Evaluation and their corresponding factors were developed. Based on the nature and the content of each category, the following logical sequential order was proposed for implementing them. The validity and accuracy of the proposed order was examined in the second round of interviews and the results are presented in the validation section of this chapter.

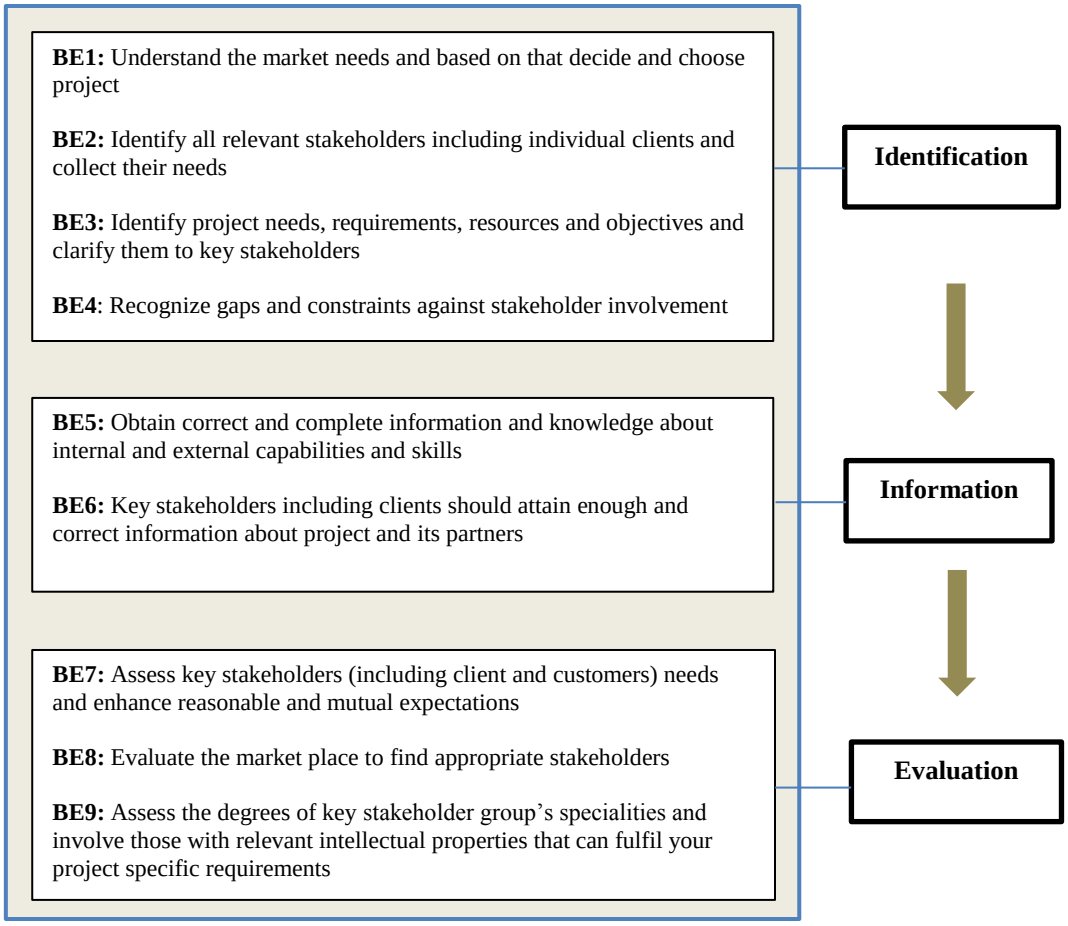


Figure 6-8: Basis ESI elements

6.5.2 Mechanism of Involvement

The first section of the ESI framework (basis of involvement) consists of the fundamental factors that are required to be taught, considered and implemented properly as the basis for successful implementation of the entire stakeholder involvement plan. This section of the framework comprises the five categories of factors that significantly focus on the process and mechanism of the stakeholder engagement improvement plan. Complete understanding and full implementation of all included factors in both parts of the ESI framework is essential to achieve its ultimate aim.

Category 4: Establishing Process

Stakeholder involvement is made more effective through a comprehensive, intelligible and clear engagement process. Evidence supports the view that before undertaking further steps, decision-makers should first set up and maintain the right

processes so that they can systematically engage key project members, in order to make sure as to what extent their interests may be influenced. Additionally, through a systematic process approach, any problems of SI can be defined, observed and potential solutions can be developed. The importance of establishing a systematic process has been widely discussed (Mutafelija and Stromberg 2003; Hall 2006). However, this research, based on the results from interview analysis, has identified the three main elements as follows:

1. Establish an stakeholder involvement mechanism and process (ME1)
2. Articulate the process to stakeholders and ensure everybody understand the details (ME2)
3. Document and monitor the process and make sure everyone sticks to that process (ME3)

Different organisations, depending on their principal objectives, should initially establish a mechanism or a process for engaging with the community of stakeholders in order to explain the policies and processes of involvement. For example, the information that needs to be delivered to stakeholders, the method of the delivery, the frequency and other issues should be determined. The process should also outline major involvement approaches to be used and include performance indicators to measure activities and monitor the entire progress of the processes to be rolled-out. Implementing this process clarifies objectives and targets, reveals any communication issues, timing matters and methods for improving involvement, that need to be in place from the initial project stages and to be continued during the later phases of design and construction. An effective process provides a basis for the organisation's strategy, involvement of stakeholders and operations. Below are some remarks confirming this approach:

> *"It is the management responsibility to make sure you (company) have a clear process or a system and making sure that all important issues are included in that process".* [P2]

> *"Having a clear process is an important part of stakeholder involvement plan. The process should demonstrate how stakeholders can get involved. They (decision- makers) should sit down, go through complete analysis and*

reviews, write everything down, determine the components and design the process." [P5]

Stakeholders can more easily handle the required processes and implement the procedures when they understand what the processes and procedures are. It is suggested that these should be developed in a clear and understandable format. In addition, when the process is designed and developed, it should be explained to the relevant stakeholder groups to ensure everybody understands and agrees the details. A contract manager shared his opinion and suggested.

"You (owner, manager) need to have clear process, explain that to the relevant stakeholders and make sure that they stick to those processes. It is also very important that those process start very early on." [P1]

The third element (ME3) indicates that proper documentation is critical to efficiently manage the process of SI. It is important to keep records of the key activities being undertaken to identify, manage and engage different parties throughout the PLC. The benefits of keeping such records were advocated by many interviewees. Such records can be valuable later on in addressing the inquiries of potential project partners, particularly those who might engage in the project at a later stage. Such documentation could also prove useful in reporting back to key stakeholders on how they have been involved in the project and how their opinion and views have been addressed (IFC 2007). These documents should also be reviewed and checked regularly to make sure any changes in the process are considered and applied. A lead architect commented:

"I think companies need to document the process so that people know what that process is for. It is also important to get documents checked and reviewed." [P5]

One effective way to ensure the correct implementation of the process is by engaging in accurate monitoring of the processes. In certain circumstances when the whole process or part of the process has some level of complexity, having experienced people to clearly interpret may be necessary as it helps to avoid potential risks. A project coordinator advocated:

"You need people, you need competent supervisors. You can't just design the process and implement it, you really need to have appropriate experience and be able to interpret the process and manage it properly." [P5]

All of the above evidence suggests that formulating an inclusive process and implementing its components will lead to significant improvement in the stakeholder involvement plan. In addition, articulating the process and making sure that all key stakeholders understand it and agree on the detail is a valuable part of the framework model. Although differences of opinions inevitably happen, the process should satisfy the major (and reasonable) requirements of key stakeholders. Furthermore, an active process may be significant in that an organisation can adapt to new stakeholders and this " provides effective management procedures and mechanisms for dialogue throughout the life of the project" (IFC 2007, P. 144). Also, a strong and comprehensive process provides stakeholders with a clear view of the project direction and contributes to improving the performance of the project. Figure 6.9 demonstrates the three major elements (ME1, ME2 and ME3) in this category.

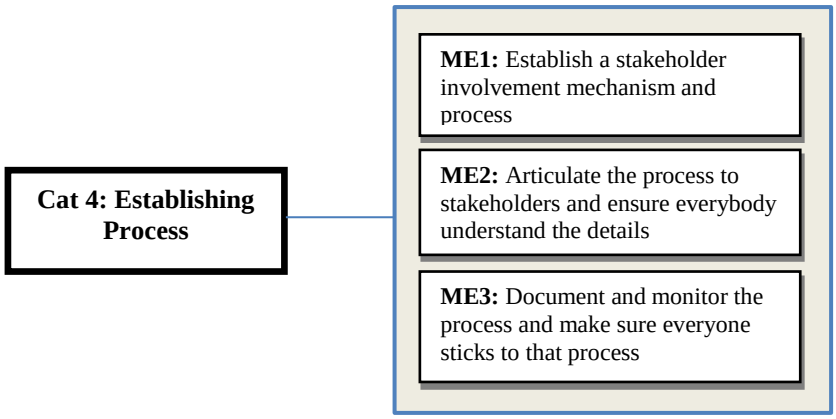


Figure 6-9: Elements contributing to 'Establishing Process'

Category 5: Timing

Successful implementation of construction building projects and the subsequent maintenance of them over the intended timescale (schedule) requires excellent engineering decisions (Al-Najjar 2008). Previously in this chapter, tight time constraints were highlighted as barriers to fully effective SI. Presented in this section are some approaches, and identified elements, which can contribute to improvement of those timing issues. The two major elements identified are:

1. Involve stakeholders in an appropriate time and right stage in the project to avoid excessive cost and improve their involvement efficiency (ME4)
2. Provide key stakeholders with necessary information in an adequate time prior to the beginning of decision making process (ME5)

One of the important objectives of SI is to enhance the efficiency of relevant stakeholders. Interview analysis shows that an essential step to facilitate this objective is to assign stakeholders (people) to project activities at an appropriate time in the project, which conforms to their responsibilities and capabilities and also is in line with strategic project objectives. The following views on this issue were shared by respondents:

> *"Having stakeholders involved in an appropriate time is a significant element for effective project planning."* [P2]

> *"If we (the designers) are involved in the right time early in the project, our involvement normally leads to better efficiencies, better coordination and generally cheaper product."*[P5]

Different stakeholders have different perspectives about the most effective approach to balancing the risks on the project. From a contractor's point of view, involvement of builders after completion of the planning and design is not reasonable since it pushes a lot of risks onto them. One contractor stated:

> *"Effectively what it (involving after planning and design) does is pushes our price up because we're pricing risk."* [P3]

A respondent from a building company also supported this view and noted:

> *"If we (the builders) are involved at the start of a project then we would be the design manager and we can coordinate and organise the design team. So if we are brought in early then we would bring the team together and that's the efficiency that we bring to it."* [P5]

The second element (EM5) indicates that providing the necessary information about the project to selected stakeholders early can simplify the decision-making process and will achieve more practical outcomes. Primary information should be

understandable and include an overall description of the project aim and objectives, probable impacts, location, timeframe, specific requirements and other necessary issues. It is important that this information is given to selected stakeholders in a reasonable time prior to the commencement of decision-making. A lead planner confirmed the importance of delivering relevant information to key stakeholders in a timely manner:

> *"One thing that can make stakeholder involvement easier is to give them information they need sometimes before the decision making process starts".* [P4]

All of the above-proposed approaches confirm the benefits of SI at appropriate project levels and also of providing them with information ahead of decision-making. However, project managers need to carefully manage this process and consider the information they disclose since very early revelation of important information might produce other risks (IFC 2007). Figure 6.10 profiles the two major elements in this category:

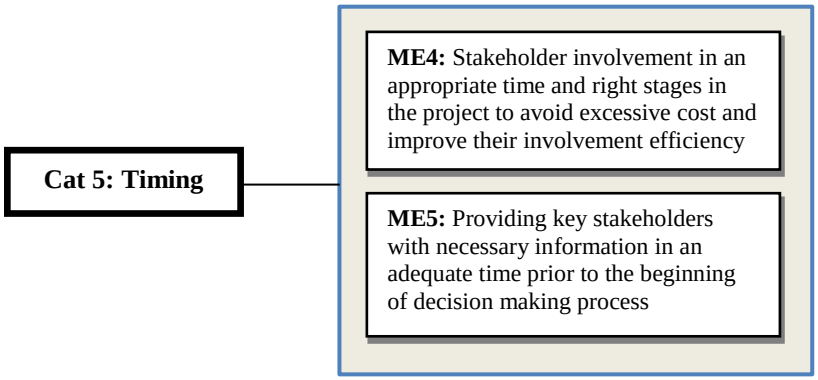


Figure 6-10: Elements contributing to 'Timing'

Category 6: Accuracy

Successful implementation of the SI plan can be achieved through the accuracy and appropriateness of different actions. The term "accuracy" represents different implications; however in this research it indicates issues such as selecting people with enough skills and expertise, assigning them into the appropriate position and at the right level and choosing the right type of contract. Evidence suggests that the following two elements in this category are important steps towards better SI:

1. Assigning of appropriate people in the relevant position and at the right level (ME6)
2. Selecting a proper type of contract which can maximise the efficiency of stakeholders' involvement (ME7)

The first element (ME6) indicates that involving people in the right and relevant positions is an important action. Different people have different capabilities and while putting them in an inappropriate position can increase the cost and decrease their efficiency, engaging them in a relevant project and suitable position will extend their effectiveness. This requires classifying stakeholders and depending on their specialities and skills deciding on the most appropriate level at which to engage them. A lead planner revealed:

> *"If people are not working in the position (and field) suitable to them, they would lose some engagement. And it's about the project manager recognising that and moving that person out of the team onto appropriate position or project."* [P4]

The second element (ME7) suggests the need for selecting a proper type of contract that can improve stakeholder involvement efficiency. According to Drew and Skitmore (1997) the contract specifies the key relationships between the major parties involved in the project and therefore it impacts on, and can control project risk. For this reason, several criteria should be taken into account when selecting the contract type. For example, project objectives, accessible resources, available stakeholders and their levels of expertise, the best method to engage them in order to increment the effectiveness and the period of their partnership should be seriously considered. Moreover, selected contract types must include all details of the agreed works and guarantee the mutual benefits for both sides. Sometimes, keeping the contract relatively short-term before the final investment decision could be the most logical choice as it gives the opportunity for both sides to evaluate the other party's behaviour, commitment and expertise and then decide to continue or terminate their cooperation. Below are some remarks from the respondents highlighting this issue:

> *"They (decision makers) should be able to select a suitable delivery method. For example traditional tender pushing of the design risk onto us (builder)*

because they make it D and C contract. While if we are involved at the start of the project it makes us king of our own destiny". [P1]

"So what we (developer) should do is we should choose a preferred contractor deed, so we should sign off a builder or a consultant for a period of time and do a design or get some information, get to certain point agreement and then get to the next stage." [P2]

Generally, depending on the project scale, objectives and nature, the stakeholder engagement strategy may be different. However, all of the views described above confirm that stakeholders should get involved in the relevant stages, in the appropriate positions and at the right levels in the project. It is also suggested that the selected type of contract should be in line with strategic project objectives and strengthen effective involvement during different phases of project life cycle. Figure 6.11 demonstrates the two elements in this category.

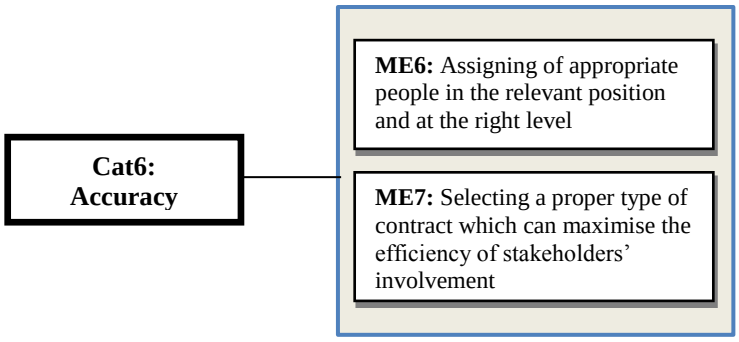


Figure 6-11: Elements contributing to 'Accuracy'

Category 7: Communication

Interacting with stakeholders in the construction industry is an essential factor of project success (Cheng et al. 2001; Nguyen et al. 2004). Across all cases, evidence support the idea that large building projects with several participants need to implement a strategic approach in order to effectively communicate and manage the entire process. In addition, Cheng (2001) highlights that due to the fragmented nature of the industry, serious consideration of project leadership team is required to enhance internal and external communication and foster cooperation among people and organisations involved with projects. As gathered from responses from the interview population, from the beginning stages to the post occupancy phases of project, effective communication processes should be in place to improve SI

effectiveness. The seven key factors suggested by industry practitioners are outlined below:

1. Enhancing relationships with internal project team members and divisions (ME8)
2. Regular communication with external stakeholders to monitor their performance and keep them informed about important project issues (ME9)
3. Clarifying of stakeholder responsibilities during the planning, design and construction phase (ME10)
4. Consenting contact with government authorities and keeping key project members updated of any changes about rules and regulations (ME11)
5. Integration of, and communication with, operations and maintenance professionals during the planning stage (ME12)
6. Ensuring that there is an effective measurement and feedback system throughout the project (ME13)
7. Motivating people, creating collaborative environment and enhancing mutual benefits (ME14)

The first element (ME8) in this category implies the importance of internal communication. Generally, communication tends to be viewed as the relationship between company's team and outside stakeholders, however, it is critical that good communication is also established between the members of the internal workforce (Mohammed and Abdullah 2006; Hoezen et al. 2006). Companies can benefit from an effective relationship with internal key members. For example, due to the constant changing of specifications within the industry's projects, having a regular meeting with different project teams internally can help to avoid rework and other similar issues in the future. A manager indicated "*this is internal communication that will extend people's involvement"*. Significance of internal integration is supported by many interviewees and it is highlighted that project leaders should engage internal members in the company's involvement plan and keep them informed about various issues during the process. The following views are shared by respondents:

"There should be communication within the company itself and everyone getting involved." [P5]

"There should be open communication among and making sure you (project manager/owner) are in consent contact with the people who are involved in the project." [P3]

"Regular communication and contact with the team, having the client or various people within the client management that have different roles and responsibilities to brings what they need to bring into the early phases, is very important". [P2]

Moreover, integration among different divisions of a company is a factor that can improve the connection between project participants. Such integration enables the people to communicate their objectives from the beginning and unifies their vision and provides a situation for effective collaboration until the later project stages. A development manager shared her view on this and stated:

"Having the integrated division enables key people to communicate their objectives right from the beginning and everyone gets on board and everyone is involved." [P2]

An important part of managing stakeholder participation is to make sure that necessary project information is delivered to external stakeholders (Olander 2006). This can be achieved through a systematic external communication. Planning for effective communication and getting external stakeholders connected throughout the project can save time; decrease cost and also assist to monitor expectations. A job manager noted:

"Employing experienced practitioners to facilitate the communication process with external stakeholders could be effective in communicating with various stakeholder groups." [P4]

In addition, different projects have different issues. It is the responsibility of the management to ensure that key project stakeholders are aware of the project issues, and to keep them updated of any new or unplanned problems and this is enables a permanent communication to be kept up with those stakeholders. Such

extended communication enables companies to monitor the performance of their stakeholders and follow up on their requirements. A development manager shared his view:

> *"You (project managers/authorities) can identify project constraints and communicate them and everybody knows. It really minimises the issues with respect to the efficiency of work."* [P2]

To achieve more collaborative involvement, stakeholder responsibilities during different project phases should be clearly defined. Although, types of contract to some degree determine this, in order to avoid misunderstanding or confusion, various stakeholders and their specific duties should be fully clarified. This approach was shared by a project manager:

> *"It's very important that your company have very set process for who is involved in each phase and what they should do in that phase."* [P5]

The fourth element (ME11) relates to the significance of setting up suitable communication with government authorities as a major stakeholder group. Analysis revealed that there should be a consenting contact with local and state governments to obtain the most recent regulatory information and keep the project members update about possible changes in rules and regulations. Furthermore, an ongoing relationship with government regulators is required as part of the business plan as they certainly have a high influence on projects and their support could be very critical to the success of the project. It can also decrease any potential misconceptions about the project and facilitate the outcomes to meet the requirements of such stakeholders. In terms of high level communications, being involved in the government or council decision-making process could be very important for a company both for future stakeholder relations and also for capturing the strategic directions might come out of such sessions. An interviewee confirmed:

> *"I think there should be a policy and procedure and a mandate that basically key stakeholders have regular communication with council to be part of the planning process."* [P3]

Analysis of the interview data provides a strong indication that having an effective interaction with operations and maintenance professionals is critical to ultimate project success. The operation and maintenance phases of projects often have unique and sometimes unknown issues, which in most cases are not considered in the early planning process. People who are involved in those latter phases of projects are familiar with the issues that can arise and thus have exclusive specialist experience. Also, operations and maintenance professionals have the capability to examine the functionality, accessibility and similar aspects of project. Such capability enables then to provide valuable feedback back from the post construction phases, which can help to planners and designers to minimise maintenance and operating costs that sometimes accrue from poor front-end work. Hence, having these professionals involved in the planning process can contribute significantly towards developing a more accurate project brief, setting up more realistic project requirements and generally leading to better preparation in the beginning of the project. The advantages of engaging these professionals are reflected in the comments provided by industry practitioners:

> *"By involving people with experience in other project phases especially construction, operation and maintenance in the planning phase, you can set up client briefs; you can set up principals, project requirements, knowing the pitfalls and you can start to structure your project the way you want upfront."* [P2]

> *"They (operation and maintenance professionals) are a very obvious stakeholder and they should get involved in the process of determining project objectives."* [P4]

The next element (ME13) in the communication category highlights that for project with multiple stakeholder groups, a strong measurement and feedback system can be a valuable source of information that will assist companies to identify and control potential risks. Future partnerships and collaborations can be formed on the basis of such a system, although consulting stakeholders and obtaining their feedback does not necessarily mean that all their needs and issues will be fulfilled, however it implies that their views can be considered during the crucial planning (and quality planning) processes. In addition, based on the results of measurement and feedback

from stakeholders, positive modifications to the entire process can be made and this makes a productive relationship. It is important that such a system starts early in the project and is continued up to the final stages. It was reported:

> *"You (project manager) have got to make sure that there is a constant measurement and feedback system throughout the process."* [P1]

> *"Obviously you should try and gain feedback from stakeholders such as builders in order to keep things simple because that keeps costs down."* [P3]

> *"Every job whether it's a building residential, commercial or high rise building needs to have a network that they can measure the project, the job."* [P4]

The final element (ME14) indicates outcomes of good stakeholder participation will be more positive if people have a deep interest in, and are motivated enough to be part of, the project. It is another responsibility of management to adopt an approach to elevate their employees' potential ability and to extend mutual relationships. For example, encouraging a positive attitude, undertaking regular training, having a proper reward scheme, considering employees' views and other similar approaches can be great examples of how to motivate people. It is suggested that if stakeholders, and especially internal employees, feel that they are empowered, they will collaborate with the project more enthusiastically and this will result in increased productivity and improvement of their involvement effectiveness. A job manager commented:

> *"Basic building block of having a good management team is to have people who are motivated, who are given responsibility but in turn have accountability."* [P3]

It is also advocated that communication in a collaborative environment will be more effective. Managers should provide an environment that is favourable to good communication and thus performance so that everybody can feel conformable enabling better interaction with all project members. Listening to the team and understanding their perspectives, problems and concerns are important to create a

positive work situation. This can highly help in efficient involvement of project members. A construction manager shared his view on this and commented:

> *"Managers should be communicated to their staff in a collaborative environment. If they (personnel) have a problem with anyone in management there should be the processes and policies that they can go and see another director, they can go and see another senior management person."* [P1]

All seven elements (ME8-ME14) in this category highlight that project leaders should make adequate and consistent communication with both the internal and external communities of stakeholders. This entails clarifying stakeholder's responsibilities, determining lines of both internal and external communication, managing engagement of operations and maintenance professionals, establishing a regular consenting relationship with government authorities as a key stakeholder of residential projects, establishing, or extending a measurement and feedback system throughout the project and using the best strategies to create a collaborative environment that can motivate people and increase their involvement effectiveness. Figure 6.12 profiles these seven elements.

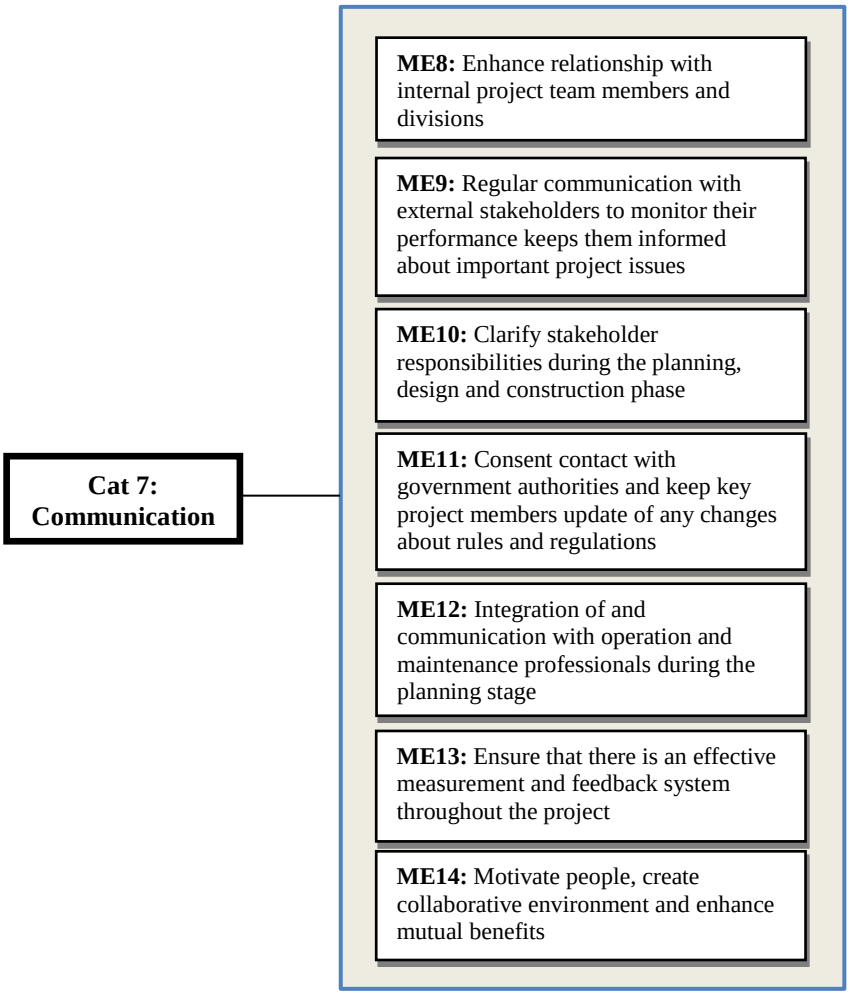


Figure 6-12: Elements contributing to 'Communication'

Category 8: Commitment

Construction project success largely depends on the commitment of its stakeholders (Leung et al. 2003; Cheng et al. 2004). According to Cheng (2004), strategic agreement would not be effective without commitment from management and other personnel of an organisation and also SI in the project is constrained and requires an extension of trust building and commitment (Hughes 1998). Commitment in this research is discussed from two perspectives; the project leaders' commitment to stakeholders and stakeholders' commitment to the project. The first view indicates the processes and activities which need to be fulfilled by project leaders to ensure that the main project and the stakeholders' requirements are satisfied. On the other hand, stakeholders should make a genuine commitment to the project by contributing their time and efforts more constructively during the PLC.

This section, based on the respondent's observations, identified the following three factors in this category that contribute to improved SI:

1. Increase management liability to ensure they get involved, control and improve the whole process (ME15)
2. Extend monitoring responsibility of key project members (ME16)
3. Ensure contractual guarantee is in place for all intellectual property inputs (ME17)

The first factor (ME15) highlights the fundamental role of management team in successful achievement of SI objectives. Competent and committed management can resolve or improve problematic issues. For example, in certain instances, projects might possess a degree of complexity and this can potentially increase the number of faults such as slowing the whole production process down. However, good management can speculate, plan and carry out the project successfully. One job manager reported:

> *"You can have a very complex design but if you have good management commitment you can carry out any design complexity."* [P3]

Furthermore, the project owner and leadership group is required to have a long-term commitment to ensure that project members have a clear understanding of their roles and responsibilities. In addition, management should be constantly engaged throughout the PLC (not only in the beginning stages of the project) to efficiently monitor and check if the project is progressing in the right direction (i.e. conforming to strategic objectives). The following statements from two interviewees support this idea:

> *"There should be a director in the high areas of management in each sector. They should get together obviously as directors and talk about different systems, talk about their team, talk about their people, and talk about improving their systems as a group."* [P2]

> *"Getting management commitment very early would be a positive step to improve the overall project quality."* [P4]

One of the important components of a successful management system is having an appropriate monitoring process. Project managers should ensure that the whole process is constantly controlled and reviewed and feedback is provided. Evidence supports the view that involving key project members in the monitoring process can increase the trustworthiness and accountability of the project productivity. It is also advocated that monitoring activities and commitment can improve the SI process by establishing mutual trust between the project and its main stakeholders (IFC 2007). In addition, organisations can benefit from enhancing the monitoring responsibility of stakeholders, as it increases transparency and strengthens the relationship between the organisation and the stakeholders and also serves to improve their commitment to the project. A lead architect confirmed this approach and noted:

> *"We (the designers) are engaged by the client to monitor the implementation process. So we control that what is on the drawing are implemented correctly and this is how we extend our commitment to the job."* [P1]

The third factor (ME17) signifies the need for a formal contractual document to control the value of all inputs. Generally, the timing, and methodology of SI should be clearly stated in an agreed contract. However, in certain situations, stakeholders are requested to be consulted and provide information at the project beginning stages even though there is no agreement or contract clarifying the cost of delivering such information. In some cases, stakeholders agree to release their knowledge and provide free consultation since they are assured that the company will involve them in the later stages of the project. But, when stakeholders are not sure whether they will be engaged later and up until the end of the project, in most cases they refuse to release their valuable intellectual property free of charge. It is therefore suggested that project leader should demonstrate commitment to these stakeholders and adopt a strategy to satisfy stakeholders of their integrity in order to get them involved in the decision making process. Below are some remarks confirming this approach:

> *"We (the contractors) can get involved in the process if there is contractual commitment and we know we are going to be paid for our time and resources."* [P3]

"Contractors don't want to give away their building smarts, their building intelligence until they have some sort of commitment from us (Developer) that we want to proceed with them." [P4]

All of the above statements confirm that it is important that management groups stay committed and involved throughout the project to control and monitor the entire process and take critical actions when necessary. They are also required to extend the participation of stakeholders to monitoring programs to ensure that they have a complete technical realisation of the process as this leads to more effective and credible involvement. Stakeholders, on the other hand, should be supportive and receptive during their collaboration with projects. In addition, leaders should also adopt an appropriate strategy to ensure all necessary information and resources are available in the decision making process. The three main factors in this category are profiled in below in Figure 6.13.

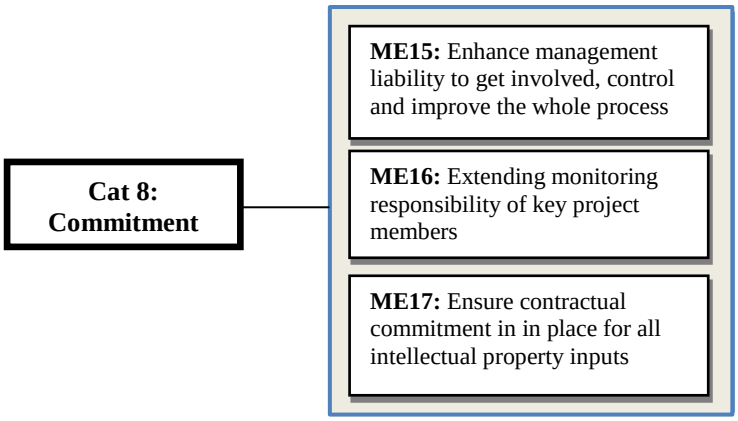


Figure 6-13: Factors contributing to 'Commitment'

Summary of the second round of analysis findings

This section reported the findings from second stage of interview analysis. The previous section identified and categorised the major impediments and problems of SI. In this second part, approaches and factors which potentially can lead to improve those barriers and contribute to effective involvement of stakeholder groups, were generally examined. Subsequently, those approaches with similar meanings and concepts were grouped to form a parent category and using this approach, finally eight categories were created. Each category then was named based on the nature of the information it provided.

Based on the interview analysis results, effective stakeholder involvement (ESI) framework was developed and presented. This framework will be verified with a number of more fully-structured interviews and the final framework will be presented at the end of this chapter. The discussion chapter (next chapter) is in two separate sections and will comprehensively examine the implications of the proposed framework and the impacts of ESI factors on improving stakeholder involvement problems and also the sources of quality issues in building projects. Figure 6.14 presents the initial ESI framework and its components.

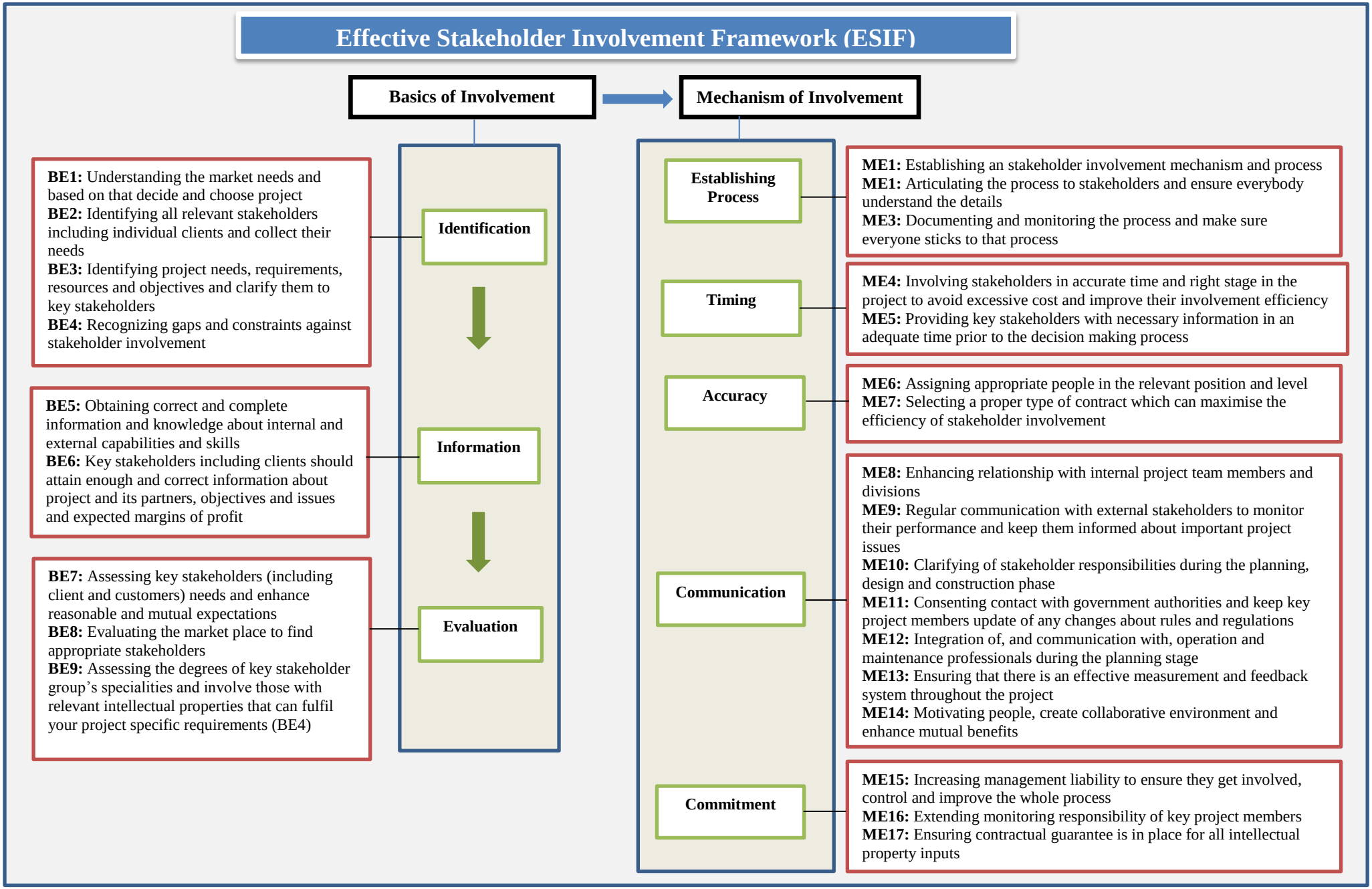


Figure 6-14: Initial ESI framework

6.6 VALIDATION

An initial ESI framework was developed based on the results from the interview analysis. In order to improve and strengthen the framework validity, this research applied a series of fully structured interviews to validate and verify the preliminary findings. Validation and verification can be conducted by using different methods, yet selected methods need to follow the research limitation criteria (Morse et al. 2001; Morse et al. 2002). This research used a second round of interviews to complete the validation as this method was quick and inexpensive for linking back with the interviews in the first round of interviews. To conduct these fully structured interviews, eight categories of the ESI framework and their corresponding (26) elements were listed and developed into a questionnaire with a five-level Likert scale starting from 'strongly disagree' (SD) to 'strongly agree'. The potential significance and objectives of this validation process were explained to stakeholders as follows:

"These elements, if designed and implemented correctly, will lead to more effective stakeholder involvement throughout the project. However, relevant decisions should be made and a proper mechanism should be designed in the upfront project stages (planning and decision making) to successfully achieve the benefits of implementing those factors. More effective stakeholder involvement, as a result of implementing ESI framework, will finally contribute to achievement of superior quality outcomes in residential building projects."

Based on the above clarification, respondents were asked to answer the following questions of each element:

To what extent do you agree with the following statements?

Table 6.3 shows an example of the designed questionnaire.

Table 6-3: Validation questionnaire

To what extent do you agree with the following statements?	SD	D	N	A	SA
Identification					
Understand the market needs and based on that decide and choose project					
Identify all relevant stakeholders including individual clients and collect their needs					

To achieve full

'saturation' nine interviews were conducted. In similar fashion to the first round of interviews, respondents were chosen from different stakeholder groups that were involved in the same and different case projects. Respondents were asked to comment on, and discuss those factors that they responded to as 'neutral' or below. They were also requested to comment on the graphical representation of the framework and the importance and sequence for implementing each category and their comments often lead to further questions designed to verify (or modify) all the factors of the ESI framework. The validation process confirmed that the final framework and its corresponding factors are accepted by all stakeholders, and that there appeared to be no underlying intention or private/group purposes entered in the framework development process. This process also helped to remove probable bias and ensure that the final proposed ESI framework was properly refined and adjusted.

Some of ESIF factors remained the same as respondents were either agree or strongly agree with them. Table 6.4 shows results of the validation.

Table 6-4: Validation results

Category	***Validation Comments***	***Revised Elements***
Cat 1: Identification	This research highlighted the importance of identification of all key stakeholders including clients during the planning phase. However, verification comments show that involving clients depends on the size of project. For example, individual clients do not get too involved in big projects, but in smaller projects you get a lot more client involvement from the project beginning stages. It is also suggested to identify and involve facility management and get their comments and feedbacks and this can help in improving the quality.	
Cat 2: Information	Evidence suggested obtaining people's objectives to understand what everybody wants out of the project is important in early project phases. It was also confirmed that project leaders should provide stakeholders including clients with information about project objectives and issues as well as expected final profit, in the beginning project stages.	***BE6: Important information regarding project and its partners, objectives, issues and expected margins of profit should be provided to key stakeholders including clients in the beginning project stages***
Category	***Validation Comments***	***Revised Elements***

Cat 3: **Evaluation**	Validation analysis confirmed that assessing stakeholders needs and extend mutual expectations is very important and need to be fulfilled in the planning process, however sometimes it might be hard to implement. It is strongly suggested that project decision makers should assess both internal and external stakeholder's specialities. They may not be able to fully assess all stakeholders' capabilities in the beginning of the project and such assessment can be done throughout the process. However, project leader should spend a lot time upfront to ensure they choose the best option.	***BE9: Assessing the degrees of key internal and external stakeholder group's specialities and involve those with relevant intellectual properties that can fulfil your project specific requirements***
Cat 4: **Establishing Process**	Validation results approved that establishing a clear and comprehensive process for both project and stakeholder involvement is very important. People should understand the rout that they are going to travel. It was added that, project leaders should set the plan, the process, and need to control that plan and keep it on track. Ensuring that stakeholders stick into the process is crucial. It is very important that managers have a good relationship with key stakeholders. However it is sometime difficult maintain it with builders. Generally management group need to be as transparent as possible and enhance a mutual relationship with other project participants.	
Cat 5: **Timing**	Validation process confirmed the significance of stakeholder involvement at the right time. It was noted that it is not good to see someone in a meeting that is not relevant. Involving stakeholders in the right stage will really help. Evidence supported that it is extremely important to provide stakeholder with necessary information prior to decision making process but it is not always achieved and we still continue on with the project for good outcomes. So it can be done at defined stages.	***ME5: Providing key stakeholders with necessary information in an adequate time prior to the decision making process at defined stages***
Cat 6: **Accuracy**	Assigning people in the position relevant to their expertise is an important approach. It was suggested that management group need to think about it in the project planning and decision making stages. It was also noted that if choosing an inappropriate type of contract, will lead the project in trouble from day one. As the factors in this category are representing the appropriateness, it was suggested to replace accuracy with this appropriateness.	***The heading changed to <u>appropriateness</u>***

Cat 7: **Communication**	Extending internal and external communication is extremely important and it is the leadership and management responsibility to design a system in the planning stages to ensure good relationship throughout the project. It is good to have external communication and update stakeholders about project issues. You should also monitor stakeholder's performance by means of that communication. It is suggested to get an independent facilitator to perform communication plans. It is highlighted that project leadership team should be careful as to who is contact with the government as it is not possible that everyone contact with government and telling them different stories. Although the importance of having an effective measurement feedback system is confirmed, it is sometimes difficult to measure the progress throughout the project. However verification analyses support that such system should be designed as early as possible in the project. Relating to the last element (ME14) in this category, it was reported that motivation is similar to having a good relationship and if you select the right people from the beginning, then you will get a better result of involving people.	***ME11: Maintaining update by having regular contact with government authorities and keep all key stakeholders inform about changes in rules and regulations*** ***ME13: Designing an effective measurement and feedback system from early project stages***
Cat 8: **Commitment**	In the first element, it was commented that liability is more like a financial word. The responsibility could be a better word. Ensure contractual guarantee for all IP inputs was a challenging element. Although respondents confirmed that having an agreed structure for getting input from stakeholders in important, they believe that providing contractual guarantee may not be possible in certain situations and it might be too hard to control. It was suggested that this factor would be more practical is a form of a mutual agreement.	***ME15: Increasing management responsibility to ensure they get involved, control and improve the whole process*** ***ME17: Developing a mutual agreement for important intellectual property inputsfrom all stakeholders***

During the validation process, stakeholders commented on the graphical representation of the framework and commented on the sequence order for implementing its components. Results show that the proposed order developed by the researcher for applying the three first categories was confirmed. Among other five categories, "Establishing the process" was reported as the most important for achieving the objectives of involvement mechanism.

It was suggested that the other four categories have the same importance and can be undertaken simultaneously and therefore no sequential preference was

proposed for their implementation. All validation comments were applied and Figure 6.15 shows the final version of the framework.

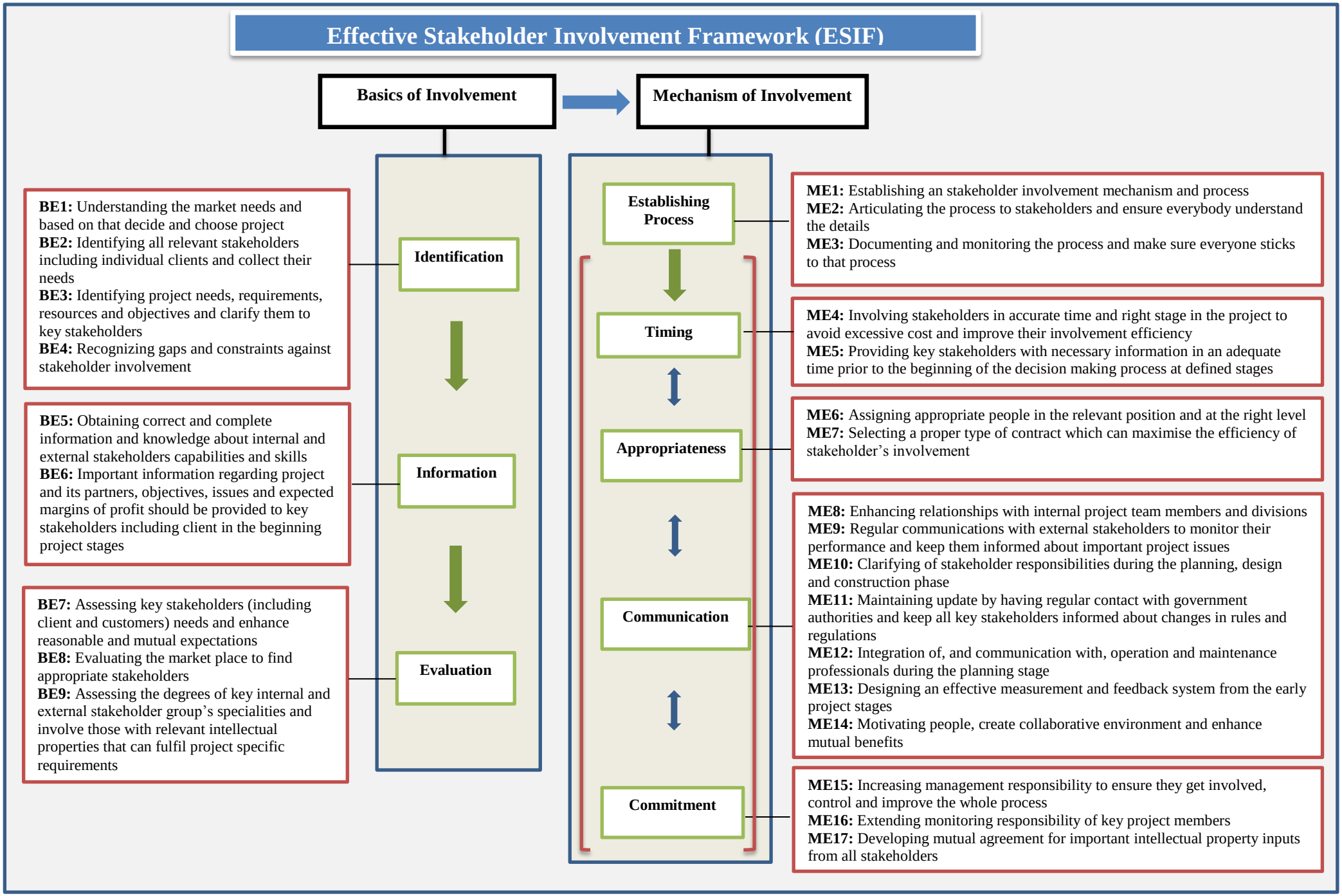


Figure 6-15: Final ESI framework

6.7 SUMMARY

This chapter presents the findings from the second stage of the research data collection. The main aim of this chapter is to cover the final research objective, which was: Develop a framework to improve and enhance effective stakeholder involvement in projects, in order to achieve better quality outcomes. Two rounds of interviews were conducted. The purpose of the first round was to investigate the approaches to develop ESI framework and the second round aimed to validate the established framework.

The first part of the results examined barriers to, and problems with, stakeholder involvement in residential building projects and the second part of the results investigated and categorised approaches and factors that can contribute to effective stakeholder involvement. Significantly, eight categories and their corresponding factors were presented and the initial ESI framework was developed. The initial framework was then verified through conducting the second round of interviews. The validation comments on the framework and its components were collected and applied and the final version of the ESIF was the developed and presented.

Chapter 7: Discussion and Implications of the Effective Stakeholder Involvement Framework (ESIF)

7.1 INTRODUCTION

This research culminates in the development of an Effective Stakeholder Involvement Framework (ESIF), which is designed to enhance the engagement of key stakeholders and directed at improving the final quality outcomes of a project. Lack of efficient involvement of key stakeholders in building projects is one of the major causes of quality issues. As discussed in this chapter more effective and enhanced stakeholder involvement (SI) through a better decision-making process in the initial and planning phase of the project can assist to overcome many of these issues and result in a better quality outcomes.

This chapter presents the answers to each of research questions and provides a bridge between the conclusions of the overall research back to the original research problem and questions. Section 7.2 is a discussion that provides answers to the first and second research questions. It discusses the weaknesses and strengths of current SI in different stages of the planning and quality planning processes. It also provides a proposition on the impact of such involvement in improving the identified root causes of many quality issues. Section 7.3 provides an indication of the problems of, and barriers to, SI and discusses how effective SI can be facilitated through the implementation of an ESIF. Practical implications are also highlighted along with the detailed examination process. This chapter is then summarised in section 7.4.

7.2 UNDERSTANDING STAKEHOLDER'S CURRENT LEVELS OF INVOLVEMENT

It is essential to evaluate an existing provision within the main research area before establishing a framework. Since the aim of this research is to enhance the effectiveness of SI through a better early decision-making process, it is necessary to understand the current degree of stakeholder contribution within the early project phases.

The level of involvement was examined based on the five-response Likert scale, starting from 'Not Involved/Very Low' to 'Very High'. Many groups of stakeholders were found in the middle of this ranking, which represents the average level of involvement. This can be seen from the mean and median scores of the responses they gave to the different questions posed.

Results in chapter 5 revealed that the degree of involvement differs based on the role of the stakeholders. Firstly owners/developer (O/D) and construction /project management(C/PM) groups were found to have a higher interaction than contractors (C) and designers (D) within the planning stages. Since, in most cases, owners/ developers (O/D) own the project, it is likely that they have the highest level of contribution in the decision making process. Yang (2010) verified that the owner's decisions and performance are significant in achieving the criteria of project success. However, due to the relatively poor levels of knowledge and insufficient information about the project in the beginning stages, many decisions are not always appropriately made.

For the purposes of this research, the planning process was divided into five phases namely: 'establish the project' (EP) 'identify stakeholder/customer' (IS) 'develop the project' (DP1) 'develop the process' (DP2) and control and operation (CO). It was determined that designers and contractors are not highly involved in establishing the project where the key objectives are to identify the projects, determine the scope, goals and objectives and establishing a mechanism to achieve the identified objectives, selecting the project team and defining project resources and their limitations. This can be attributed to the lack of attention paid by these groups to the importance of understanding the role of key stakeholders and the significance of their inputs into the decision making (DM) process. Arditi (1997) and Marosszeky (2002) reinforced this view, stating that even though project performance depends on creating a team relationship between contractors, designer and the owner in the project initial phases, it has not been evidenced much in the residential building sector. On the other hand, responses given by some case study respondents show that a few contractors believe that their engagement at the very early stages is not actually necessary, especially when they merely get involved as 'the builder' who will perform later in the project life cycle.

In spite of the fact that correctly identifying key stakeholders and analysing their needs and requirements, is a necessary part of the planning phase, and that the ability to correctly identify and manage stakeholders can mean the difference between success and failure (PMI 2013) , this research determined that owners and developers are not highly engaged in a systematic identification process. According to Forcada (2012), in many cases final clients who will become the owner of the property, do not engage in the planning, design and construction process. He (ibid 2012) adds that they come into view only when the project is nearly over. This issue may be the result of certain reasons; firstly, lack of knowledge and information about the project and its features can be a major barrier to effective interaction between the owner and the project. Olander (2007) suggested that poor client knowledge can negatively influence both the project and its stakeholders. The responses given by the case study respondents show that poor client/owner information about project aspects is a significant barrier to their involvement in the DM process. In addition, lack of owner expertise and skills in establishing an effective system to collect and assess stakeholders' demands was also highlighted as a barrier.

The quality planning of most projects will be challenged with a large number of stakeholder needs, and therefore the project team should classify and assess those needs and demands properly. Interview analysis suggested that developers sometimes ignore the significant role of key stakeholders in achieving quality project outcomes and therefore do not offer them an opportunity to contribute to the DM process. This issue may result from their poor commitment to the project and thus if stakeholders, and in particular the management group are not fully committed to the project, achieving success will be very difficult.

The project development (DP1) phase is where the project is actually operationalized. Activities such as grouping of related stakeholders' needs, determining the method of identifying project features, identifying the quality expectations, identifying acceptance criteria for project deliverables and designing a system to monitor the project performance, are all completed in this phase. This phase focuses specifically on the role of quality in project development and examines how that role combines with the technical aspects of design and development (Juran and Godfery 1999). In spite of the significance of this phase of the planning process, it was found that owners/developers and designers do not contribute greatly to the

successful achievement of its objectives. One of the major reasons for this may be due to their apparent lack of commitment to project success. Analysis of case studies demonstrates that poor commitment can negatively impact on the efficient interaction of stakeholders with the project, resulting in many subsequent quality issues. This is consistent with the view of Serpell (1999) who found that the lack of interest and commitment is high amongst the various barriers and limitations of achieving the success of the prime processes.

Poor commitment can have different causes. Sometimes stakeholders, even at the management level, are not motivated enough to put enough energy into processes to appropriately perform their responsibilities and this can produce subsequent problems. It is suggested that project management teams should provide incentives to encourage people to work more efficiently and cooperatively. In addition, in certain situations, the low level of involvement arises from the lack of contractual agreements covering the intellectual property inputs. This means that some stakeholders, and in particular contractors, are not keen to release their information, knowledge and expertise in the early phases of projects if there is no guarantee that they will be awarded the design and implementation of the project. This might be a reason that contractors' level of involvement is the lowest among all groups of stakeholders. Review of the literature revealed that contractual provisions should be provided to prevent potential conflicts among different parties (Hwang and Lim 2013; Pheng and Wei 1996).

It was found that having too many different opinions upfront can result in an overly lengthy DM process. Case study evidence suggests that this can be one of the reasons that project leaders are not keen to involve so many people in the approval and planning stages of projects, particularly those who might have different objectives and expectations such as the designers and contractors.

Many other significant elements are included in developing the project, for example, identifying and addressing all of the relevant standards, guidelines, policies and procedures, identifying working conditions, establishing a QA system and measuring and monitoring the project performance. It was found that people sometimes do not fully contribute to the implementation of these elements due to the lack of awareness of the advantages and the needs of applying such factors in the

project. Zwikael (2009) shares this view and has states that if stakeholders do not realize how each component of the planning process can help to achieve success, then they would probably not fully contribute to the achievements. In addition, some participants believe that a lack of stakeholder experience and skills in planning, developing and implementing such factors, is a hurdle to their successful involvement. Case study analysis reinforced this view and confirms that engaging people with none (or limited) experience and expertise would not be effective. Juran (1999) highlights that procedures and standards clarify the project specific features, which may come from inside the organisation, or from the local governments and regulatory agencies. Therefore an expert team is required to assess all these documents against the project features, goals and objectives.

Determination of the local and governmental specifications and regulations is sometimes impacted by legal and political constraints. These constraints, which are associated with major external organisations, can be challenging and risky. Since these organisations, in many cases, can have high influence on the project, any conflict with them can result in difficulties and delays in finalizing the planning process. Practical approaches to overcome this issue will be fully discussed later in section 7.3.

Once the project has been developed, it is essential to determine and establish the processes by which the project will then be developed and delivered. The level of team involvement in developing the process (DP2) was found to be less than high, but still above average and this can be related to many factors. Sometimes, a project has some degrees of complexity and it was determined that establishing and monitoring the various processes for complex projects requires a substantially higher level of competency. Aje (2012) confirms that in the construction industry, where many companies are involved, the process of determining participants must place an emphasis on their technical, practical and managerial skills. But finding a stakeholder, especially a contractor with a high enough level of proficiency is not always easy. In addition, deciding on the most accurate methods to implement the processes needs a perfect understating of the project and its specific features. Indeed when participants do not possess adequate and correct information, or are not expert enough, implementing such processes cannot be fully facilitated.

Analysis of the survey data revealed that the contractors' involvement in the planning phase of projects was considerably lower compared to other stakeholders. In many cases, contractors are attributed simply as builders and they are assigned only for the execution of the project. Therefore they get engaged when the planning and design is almost complete, the scope, objectives and stakeholders are identified, the acceptance criteria are determined and the project process is established. Nevertheless, depending on the type of the contract, they may get involved prior to the design phase, but after the planning is mainly completed. It was found that in such situations, the contractor involvement level is low and that will negatively impact on subsequent project quality. Pheng and Wei (1996) confirm that the quality of the construction project is largely dependent on the attitudes of contractors. Sometimes the contractor's objectives do not align with the strategic project objectives, which might result in conflict among different parties and affect the final quality outcomes. However, interacting with contractors in early phases can prevent such conflict. Contractors are sometimes assigned to carry out the project from beginning to the end. In that case they will get engaged in the conceptual and planning phases but they are more a developer in this instance, rather than a contractor. Another reason for the low level of contractors' contributions could be the issue of competitiveness. Involving contractors in the very initial stages might result in the project losing the competitive edge during the tendering process. Such early involvement can also create a misconception among contractors that they have already been pre-selected as those to be finally undertaking the construction phase.

Activities such as designing the feedback system, determining the criteria for effective operation and control, and developing a plan for transfering the project to the operation phase, are the major activities of the control and operation (CO) phase of the planning process. However, the survey analysis showed that generally stakeholders do not highly contribute to fulfilling the objectives of this phase. This can be associated with poor knowledge of the relevant criteria and the significance of effective monitoring, controlling and feedback systems. Although monitoring and feedback by the key project members are elements positively contributes to achieving the desired quality level (Jha and Iyer 2006), this process is not always able to be achieved.

Furthermore, cost limitations are the barriers to the effective implementation of various important project systems in many cases. Participation of stakeholders is a time and cost consuming process and it might be a matter of conflict for clients since the more time spent in the project initial phases the more cost is at that time and later is imposed on them. Additionally, in the residential construction sector during the planning process, external funding such as bank loans and other sources of financial support, may not be available and therefore, owners and developers prefer to have as few people involved in that process as possible. Although the incompleteness of the project plan due to lack of required technical support and competency of key stakeholders might impose additional costs in later project stages, owners or clients still do not efficiently coordinate sometimes with stakeholders' representatives during the planning process (Wilson and Rezgui 2013; Olander and Landin 2005a). In addition, even if stakeholders do get involved in the project, the planning and implementing of many project activities can still be influenced by cost issues. Attributes such as establishing an effective audit system, developing a monitoring, measurement and feedback process, and establishing an efficient information system, are examples of such activities.

It can also be argued that in certain cases, cultural and political constraints are the reasons or a lower level of stakeholders, especially those related to factors concerned with human nature are challenging issues. A lower tendency to collaboration due to the traditional prevalent in the parent company of the project sometimes disconnects it from other key stakeholder groups. In addition, often clients assume that involving many people in early planning process may increase the risk of information disclosure, and for that reason they prefer to keep necessary parties only involved.

The survey analysis examined the relationship between effective SI and potential improvement levels in root causes of quality issues. It was found that many issues that result from poor management and performance of project participants, can be resolved, or improved, through the enhanced incorporation of key project team members within the initial stages of the PLC. Findings are consistent with results from the literature review that highlight the apparent role of key stakeholders as an important factor in improving levels of project quality outputs(Pheng and Wei 1996;

Joaquin,Hernandez and Aspinwall 2010; Aje 2012; Olander 2006). Practical influences of ESIF elements on quality problems will be fully discussed in section

7.3 IMPACTS OF THE ESIF ON ENHANCING SI AND IMPROVING QUALITY ISSUES

The barriers to, and the weaknesses of, current stakeholder involvement (SI) in the planning process of building projects, has highlighted the need to examine the impacts of effective early decision-making to enhance the effectiveness of key stakeholder's engagement. The findings from this examination of such attributes may consequently improve many quality issues which arise from the poor management and performance of project members. Olander (2007) and Mshelbwala (2005) have argued that in the construction industry, where many stakeholder can influence project success both negatively and positively, the process of determining the capability of people to try to systematically increase their contribution, must be part of any managerial plan.

Analysis of the data in this study reveals that the respondents were aware of the significance of early involvement but nonetheless, their understanding of the issues was constructed through experience, and not based on any framework, standards or other formal instruction/documentation. The ESI framework presented in this research has grouped the approaches that contribute to improving the involvement of key project stakeholders, by applying more competent decision-making strategies in the initial and planning process phases of projects. The remainder on this chapter evaluates the influences of the elements of ESI framework on enhancing stakeholder contribution, and accordingly to improving quality.

7.3.1 The influences of Basis Involvement Elements

The ESI framework presented in chapter 6, section 6.6, consists of two parts namely 'Basis of Involvement' (BOI) and 'Mechanism of Involvement' (MOI). Nine elements associated with the BOI are summarised under the three categories of 'identification', 'information' and 'evaluation'. These elements form the fundamental steps for improving the effectiveness of SI, and as suggested by data from case study respondents, these are the prerequisites for implementing the second part, MOI. These critical factors were frequently highlighted by the literature review

and by the respondents as being important attributes for improving and removing the barriers of SI, and accordingly impacts upon quality issues. For example, understanding the market needs and choosing the project in accordance to those market needs will facilitate the process of identifying the project attributes that will ensure its conformance to company strategies.

It was found that if relevant stakeholder groups are systematically identified, then the owners and decision makers can efficiently interact with them and decide upon the significance and the importance of each group. Bal (2013) and Gao (2006) reinforced this view and stated that a proper identification process is an important step to distinguish between the parties to be involved and the parties not be involved. Jha and Lyer (2006) argued that the top management should be entitled to identify key project stakeholders such as the project manager and designer. If the project members are clearly identified, then it will be easier for the leaders to involve and communicate with them.

There may be situations where diverse expectations and various interpretations of requirements create a controversial situation, which results in some level of confusion of what clients really want to attain. An essential step to overcoming this issue, supported by many respondents, is to progressively collect stakeholder needs, requirements and expectations. The underlying logic as stated by Aaltonen and Kujala (2010) is that by collecting needs and preferences from different parties, conflicts to plans and other issues that sometimes happen in the execution and operation phase, are minimised.

Lack of information about the project objectives, limitations and specific features, as well as the identity of potential stakeholders, their skills, capabilities and characteristics will always hinder the efficient incorporation between the client and the project team. These barriers can be improved through the proper operation of the elements highlighted in the 'information' category. For example, it is suggested that the management team must obtain correct and complete information about both groups of internal and external stakeholders in the beginning stages of the planning. In addition, bringing together information about project objectives, expected outcomes and probable issues will help the managers, and particularly clients, to make more realistic decisions. Lam et al (2001) signified that the more complete the

information provided in the early phases, the more effective, practical and accurate the strategies to be developed throughout the project. It was found that some quality managerial issues can be resolved if a complete set of data is available. This can be attributed to the fact that, having enough information about project and its partners will prevent delays in making important decisions.

One of the critical factors of project quality management is to turn stakeholder's demands and expectations into requirements using stakeholder analysis during the project planning stages. Once the group of stakeholders are identified and their requirements are collected, it is necessary to assess those needs to enhance reasonable and mutual expectations. This is consistent with the approach proposed by Johnson and Scholes (1999a) who believed that it is not enough to simply identify stakeholders, the managers and owners of projects need to evaluate stakeholder needs and to articulate their expectations on project decisions and if necessary follow these decisions. Accordingly, some managerial and political problems such as uncoordinated needs and expectations and aggressive competition during bidding process can be improved through the development of reasonable and mutual objectives. Evaluating stakeholders relative to their influence, interest and attitude assists in bringing the most salient group actively into the DM process. In addition, clear and comprehensive assessment of stakeholder requirements can minimise the risk of confusion. Supporting this argument is the evidence from other respondents, suggesting that analysing and establishing objectives that satisfy the requirements of the main parties can prevent problems such as contentious environment and confusing attributes, leading to more effective contribution of different groups throughout the PLC.

The findings of the present research agree with those of Aje (2012) and Verbeke (2013) regarding the impacts of stakeholder skills and knowledge on the quality of project outcomes. The difficulties caused by a lack of people with relevant knowledge have been highlighted as a major barrier to effective SI. Nevertheless, it was frequently supported by the respondents that clear assessment of people capabilities and skills is a fundamental determinant to involve, or not involve, them. While absence of the right people can produce many problems, having stakeholders with the related skills and adequate knowledge, particularly when the project is complex, can improve many issues in terms of outcomes of time, cost and quality.

This view is supported by Lam et al (2001) who claimed that assessing project participants' competence, based on the information and knowledge retrieved about them, is a strong link to determining the most suitable team to fulfil the project specific requirements. This approach helps in improving quality issues that happen due to the poor knowledge and skills. For example, poor performance of quality tools and techniques will presumably get improved when high quality engineers are involved. Moreover, low quality drawing and specifications, which are amongst those critical factors that negatively affect quality outcomes, can be eliminated through the involvement of proficient and committed architects.

7.3.2 The Role of the Mechanism of Involvement

The second part of the ESIF consists of five categories with 17 factors representing the mechanism that extends stakeholder engagement. These categories are 'establishing process', 'timing', 'appropriateness', 'communication' and 'commitment'.

It was found that the first step to facilitating actual involvement is to establish the methods, and to clarify the processes in which stakeholders should get engaged in the project. In addition, the process should reflect the requirement, objectives and limitations of the project. This is consistent with the view of Olander (2007) who believed that a management process is necessary in order to determine how the relevant stakeholders should get involved, what impact they have on project decisions, how they react on project decision and what influence their reactions will carry. On the other hand, the evidence from the case study analysis suggests that the process should indicate how stakeholders may interact with each other, the project managers and other professionals, to affect the chances for success of a proposed project strategy.

Further analysis showed that once the process is established, it should be articulated to the relevant stakeholders to confirm that everybody understands the details. Supporting this argument is the evidence from other participants signifying that the stakeholders can handle the process and implement the elements only if they fully understand what the process is. Since the attitudes of stakeholders can change over time a clear documentation system is necessary to record all of the important

stakeholder and project information. Besides this, an effective monitoring process can ensure that everyone sticks to the process and this also helps to continually improve their performance. This view is supported by IFC (2007) indicating that because the strength of engagement varies during different phases of a project, it is useful to periodically monitor key stakeholder groups and their levels of satisfaction with the project in general ,and the involvement process in particular. Nonetheless, the interview analysis demonstrated that this issue may not be always easy and requires a competent and verified monitoring process to be designed by project leadership team as well as other key stakeholders.

Low levels of SI in certain phases of the planning process can be due to the deficiency in properly establishing the process. Having a detailed process can also overcome a number of SI problems in terms of stemming confusion and preventing the loss of competitiveness, and these will all lead to improvement of several quality issues such as a poor supervision and monitoring system, and lack of process improvement.

Further analysis showed that the final purpose of the ESIF can be achieved when all elements of the framework and particularly operational factors are successfully planned and performed. Hoezen (2006) argues that the effectiveness and efficiency of the process depends on the quality of many factors such as communication and commitment. Interviewees' feedback gives a real picture of how involving stakeholders at the appropriate time and during the right stages in the project will contribute to avoidance of excessive costs and improvement of their productivity. Conclusions drawn from the first part of the ESIF revealed that a complete assessment of project requirements and objectives, as well as stakeholder responsibilities and expertise, will help to facilitate their involvement at the correct time and in the right stages of the project. This will contribute to improving several barriers of SI, such as a lengthy process of decision-making and involving people in the wrong stages of the PLC. More respondents believe that providing key stakeholders with the necessary information in an adequate timeframe prior to the DM process being finalised is a significant step to making SI easier. This view is supported by Bal et al (2013) who note that in order to increase the effectiveness amalgamating professionals together, an understandable set of information about the

project and its features should be provided to them before the decision-making process begins.

The above discussion suggests that 'right-time' stakeholder involvement, if accompanied by the transformational imparting of the necessary information about the project, can contribute to improving a number of quality issues that result from poor management. For example, problems such as delay in making important decisions, lack of information and ineffective supplier impacts can be eliminated or minimised.

This research agrees with the findings of Pheng and Wei (1996) that the quality of the project is adversely affected if the parties to the contract are not employed in a position, which matches and conforms to their expertise, meaning that consequently they are unable to carry out their responsibilities properly. Interview analysis revealed that some of the SI barriers can be significantly removed if everyone is located into their most appropriate positions. For example, poor commitment can sometimes results from inconsistency between the expertise of people and the position to which they are assigned. Further analysis stressed that assigning people in the position and stages related to their specialities can contribute to improving both their motivation and commitment.

Data from all five cases provided evidence that the type of contract which is selected for a building project, can significantly affect the ways in which stakeholders may get engaged in the initial phases of PLC. Since the contract is the only document that ultimately determines who should get involved, and when should get involved, decision-makers must take into serious consideration choice of the contract type and its complexities related to it conforming to the different group capabilities and current workloads. This should also help to increase the efficiency of their work. It was argued that although the selection of a standard form of contract may sometimes become a matter of conflict for the project owners or clients, the nature and the format of the chosen contract should be able to define the major project requirements. According to Drew and Skitmore (1997, p.5) "in construction contracting the type and nature of construction work is dictated by the make-up of the contract packages which are determined by the client ". It is therefore essential that the contract package includes all of the necessary information in terms of type

and scale of the work, the complexity level and the full required specifications. This research argues that because in the construction industry contracting is demand driven, a competitive environment may be created which needs a significantly strategic management approach to avoid it becoming a destructive process.

Elements associated with the 'communication' category were found to possess high importance in shaping an improved involvement plan. Enhanced relationships and regular communication with both internal and external stakeholders should be an essential part of the management strategies. Supporting this argument is the evidence from case study respondents, suggesting that effective relationships should be present so that different parties can engage in a productive interaction. Moreover, active communication between project team members can increase the awareness of the project and make it better prepared to comply with varying stakeholder requirements. Bal (2013, p.705) states "it also makes it more able to respond efficiently and effectively to the difficulties that may arise or issues that need to be resolved."

The findings from this research agree with those of Hoezen (2006) posited that improvement in the communication within the project team and between key participants could reduce many defects in terms of cost, time and quality. Besides this, more open relationship can often potentially lead to improvement in technical issues such as the downsides of a difficult data collection system. Operative communication with suppliers and customers provides firms with excessive assets such as a good reputation and high-quality relationships. According to Verbeke and Tung (2013, p.535), "these assets are hard to reproduce by competing firms as no two reputations or relationships are identical. As a result, firms that have a greater capacity to access valuable resources thanks to their reputation and relationships can be expected to command a stronger competitive advantage, which yields higher financial performance and increased economic value". It was suggested that an actual communication system should be designed in the early project phases and then implemented throughout the PLC. This is consistent with the views of Emmitt and Gorse (2003) and Arditi and Gunaydin (1998) that communication improvement in the initial phases could positively impact upon the quality as perceived by key parties involved including, contractor, supplier and client.

As part of the communication plan, regular contact with government authorities should help to ensure that a potential conflict does not arise between project team and government officials. Managing a consistent relationship with external authorities provides the company with the updated information about the necessary overriding rules and regulations, and helps them take necessary actions in case of any changes. Political constraints that in some way hinder the ESIF can be resolved with the formation of enhanced relationships between project decision makers and regulatory bodies.

Participants of this research confirmed the view of Jha and Iyer (2006) who believed that a hostile work environment will adversely affect the quality outcomes of a construction project. A poor work environment will not only reduce the productivity of project players, but could also negatively impact upon project success. This research therefore suggests that creating a collaborative work environment can enhance the mutual benefits and encourage people to increase their efficiency. This can be achieved through engaging in the use of several established collaborative management tools and techniques, including focus groups, group creativity techniques, and group decision making techniques. This was also evident in the study conducted by Andersen (2006) who affirmed that if participants are motivated towards the final goal, rather than merely the functional activities involved in the project completion, then the project can make better progress. Additionally, efficient communication channels, if planned and applied correctly, can help to overcome certain SI barriers. For example, problems such as stakeholder's unfamiliarity with the project requirements, uncertainty about main objectives and unclear demand and purposes, can all be minimised through the managed and systematic relationship between different parties, although other approaches may need to be taken into account that contribute to entirely eliminating those problems. Olander and Landin (2005a) reinforced this view and stated that an important issue of project management is to manage the differing demands of stakeholders and extending mutual objectives through efficient communication which needs to start in the early project stages.

Case study analysis showed that for projects with multiple stakeholder groups, a strong measurement and feedback system would be a valuable source of information that can assist companies to identify and control potential risks. It was

determined that future partnerships and collaboration can be formed on the basis of such systems. Although consulting with stakeholders and obtaining their feedback does not mean that all of their needs and issues will necessarily be fulfilled, it implies that their views can be considered during the crucial planning processes. Bal (2013) argues that there is a need to measure all key stakeholders' individual performance to determine whether they are meeting their essential responsibilities to contribute to achieve a better outcome for the project".

It can be concluded from this discussion above that effective communication can eliminate a number of managerial quality issues such as poor partnering among project participants, and uncoordinated needs and expectations. It will also contribute to improving some technical issues. For example, although the complexity in design requires advanced level of interpretation, yet the relationship between designer and contractors can increase the clarification of objectives and help to identify the solutions.

Factors associated with the commitment category were emphasized with the high significance in establishing and improving a competent SI mechanism. A study of relationships between the management performance and project success verified that project success is significantly impacted by the performance of the owner, manager and contractor (Yang et al. 2010). Evidence of case studies indicated that top management should get involved from the very early stages and remained engaged to the end of the project, to monitor and control the entire process. Management commitment in different phases of the planning process is an essential factor to overcome the barriers of SI and achieve better quality outputs. The literature review supports this approach, that is that one of the significant factors that affects the planning process and the project quality is the commitment of management to continuous quality improvement (Arditi and Gunaydin 1998; Jha and Iyer 2006).

Giving more incentives to key stakeholders by extending their monitoring responsibility was argued as being a positive driver to ESI. This finding is in line with that of Soetanto (2001) who observed that the satisfaction of the main project participants in the context of a building project is a prerequisite to keeping a 'delightful working relationship'. It is therefore necessary for key project members to monitor and analyse the performance of each other on a 'mutually agreeable basis'.

This is how they can enhance their commitment and improve their own performance for the benefits of the overall project.

Further analysis in this research shows that the contract should clearly stipulate the details of stakeholder engagement. Nonetheless, sometimes stakeholders and particularly consultants and contractors are requested to provide consultation in the early decision-making process and before the contract is officially signed. In some cases, stakeholders agree to release their knowledge and provide free consultation since they want to demonstrates their capabilities and increase their chance of continuing with the project until the later stages of design and construction. Nonetheless, some stakeholders refuse to provide their consultation free of charge, especially if they offer something that is innovative and unique. It is therefore suggested that project leaders develop mutual agreement with stakeholders, whose early advice and intelligence can make a big difference to the direction of the project. Mohammad and Abdullah (2006) reinforced this view stating that a contract structure that fits the partnering arrangement should be developed to drive forward the project quality objectives.

Finally, it was argued that the ESIF elements should be planned and designed in the early project planning processes. However, correct implementation of those elements, particularly those corresponding with the MOI can give high assurance that the successful achievement of the framework objectives will occur. So, although a comprehensive involvement system must be designed in the early stages, it needs to be implemented throughout the PLC (Aaltonen and Kujala 2010).

7.3.3 The Relationship between ESIF Factors with SI Barriers and Quality Issues:

The above discussion revealed how a more effective decision-making strategy in the planning process can overcome the barriers and problems, which hinder ESI on the project. It also demonstrated the potential positive influence of ESI on improving quality defects that have their roots in the poor management and performance of stakeholders. The following figure summarises the relationship between the elements of ESI framework with stakeholders and quality improvement.

Table 7-1: ESIF impact upon SI and quality issues

No.	ESIF Categories	ESIF Impacts	
		Potential improvement in SI problems/barriers	**Potential improvement in quality problems/defects**
C1	**Identification**	• Poor identification and low level of information about key stakeholders including clients and final customers • Insignificant knowledge about the project and its objectives • Uncertainty about main project objectives • Changing the strategic project direction and creating confusion	• Absence of long term objectives • Low effective project management system • Lack of client engagement • Low quality material/equipment
C2	**Information**	• Client unfamiliarity with project requirements • Lack of knowledge about stakeholder groups and their expertise • The perceived increase to the risks of investing in particular projects	• Low effective project management system • Lack of client engagement • Diverse needs and expectations • Project complexity
C3	**Evaluation**	• Competition amongst the main stakeholders' objectives • Lack of skilled, qualified and experienced • Unclear final profit margins people	• Low effective project management system • Diverse needs and expectations • Lack of stakeholder's adequate knowledge and skills • Low quality material/equipment • Difficult application of quality system • Poor performance of quality tools and techniques
C4	**Establishing Process**	• Elements associated with this category will form a structure which can contribute to the improvement of many SI barriers	• Elements associated with this category will form a structure which can contribute to improving many of the quality issues

C5	**Timing**	• Involve people in improper stages of PLC • Lengthy process by having many opinion upfront	• Unproductive supplier impact • Delay in making important project decisions • Lack of motivation
C6	**Appropriateness**	• Assigning people to an irrelevant (incorrect to skill) position • Commitment/agreement deficiency for IP inputs • Competitive stakeholders objectives	• Inappropriate method of contractor selection • Delay in making important project decisions • Lack of motivation
C7	**Communication**	• Changing the strategic project direction and creating confusion • Competitive stakeholder objectives • Greater complexity in design • Administration approval • Lack of 'right' culture • Difficulties with political uncertainty	• Poor relationship and partnering among project participant • Unproductive supplier impact • Poor coordination among design and construction • Diverse needs and expectations • Low tendency to teamwork • Conflict with government authorities • Difficult application of quality system • Difficult data collection system • Poor performance of quality tools and techniques
C8	**Commitment**	• Uncertainty in getting key stakeholders committed • Commitment/agreement deficiency for IP inputs	• Poor supervision and monitoring system • Lack of process and continues improvement • Low effective project management system • Poor management commitment • Unproductive supplier impact • Difficult application of quality system • Poor performance of quality tools and techniques • Lack of auditing system

7.4 SUMMARY

The aim of this research was to improve those quality issues that have arisen from the poor management and

performance of stakeholders, by developing a framework that enhances effective stakeholder involvement in the project, by applying the best decision-making strategies in the planning process.

This chapter has created the bridge between the research questions and the research conclusions through the assessment of the research findings and by providing an explanation of the practical implications. The next chapter presents the final conclusions of this research and presents the overall implications for academics and practitioners, together with recommendations for future research.

Chapter 8: Concluding Remarks

8.1 INTRODUCTION

This research attempted to enhance the involvement of stakeholders in the project that can lead to achieve better quality outputs, in a framework named as the

ESIF. This was completed though the use of quantitative and qualitative mixed methodologies.

The ESIF provides and helps to address, a better understanding of stakeholders concerns in residential building projects. Chapters 5 and 6 analysed the data collected from a survey and five case studies. The findings and their implications were exclusively discussed in chapter 7. In Section 8.2 of this chapter, all of the key findings of each chapter are summarised and the chapters continues by explaining how the research questions have been addressed in the previous two chapters. Section 8.3 discusses the research contribution to knowledge and to the construction industry. The limitations of the research and implications for future research will be explored in section 8.4 and a final summary of the research will be presented in section 8.5.

8.2 ENHANCING STAKEHOLDER INVOLVEMENT

The two concepts of stakeholder management and quality management were considered and combined to form the underpinning theoretical factors. The ultimate objectives of this research were to identify the root causes of quality issues in projects, improve the management of such issues, and facilitating the accomplishment of better quality outcomes in residential building projects. For this reason an extensive literature review was conducted to identify typical quality issues that arise during and in the completion stages of these projects. It was found that many of these problems are the result of other factors called "the root causes of quality issues". This research, therefore, attempted to bring together the most notable factors that result in poor quality project outcomes. These factors were categorised under four main headings namely 'technical', 'material, equipment, and environment', 'cultural and political' and 'stakeholder, managerial'. It was found that poor management and performance of key stakeholders, which according to many scholars, are due to lack of effective involvement and efficient contribution to the project, can adversely influence project quality outcomes. The main focus of this research, therefore, was on improvement of stakeholder involvement (SI) through better decision-making strategies in the early phases of the PLC.

An Outline of the Major Findings

Two stages of data collection, a survey and five case studies, and accordingly two data analysis approaches of quantitative and qualitative were designed and implemented to address the research questions. The results of the first stage of data analysis provided an understanding of the weaknesses and strengths of current level of SI. It revealed that serious consideration should be given to facilitating the more effective incorporation of different project members during the project life cycle (PLC). Quantitative analysis also confirmed the findings from the literature stating that an effective involvement of stakeholders will highly contribute to resolving, or improving several quality issues, direct or indirect.

The second stages of data analysis (qualitative) identified the barriers to and problems of ESI. Significantly, practical approaches suggested by case study respondents provided an understanding about how a more comprehensive involvement plan can deal with these problems. It has been revealed that to improve the effectiveness of SI in residential building projects, the following strategies need to be considered.

- Clearly understand the market needs and based on that decide and choose the project that can satisfy company's overall strategies
- Identify relevant stakeholders including individual clients in the beginning of the project and collect their needs and requirements
- Identify and classify project needs, requirements , resources and objectives and clarify them to key stakeholders
- Recognize any gaps or constraints that can hinder effective stakeholder involvement
- Obtain correct and complete information and knowledge about the capabilities and skills of both internal and external stakeholders
- Important information regarding project objectives, issues and outcomes as well as project partners should be gathered and provided to all key stakeholders including clients in the beginning project stages
- Assess key stakeholders (including client and customers) needs and enhance reasonable and mutual expectations
- Evaluate the market place to find appropriate stakeholders

- Assess the degrees of key internal and external stakeholder group's specialities and involve those with relevant intellectual properties that can fulfil project specific requirements

The above approaches were the fundamental steps to facilitate the objectives of the ESI and all need to be planned and implemented during the project decision-making stages. In order to enhance the contribution of key stakeholders, other approaches (listed below) should be taken into account. All of these elements are required to be planned in the early phases of the PLC, but they should be implemented in the later stages of design and construction. These elements are summarised as follows:

- Establish an stakeholder involvement mechanism and process
- Articulate the process to stakeholders and ensure everybody understand the details
- Document and monitor the process and make sure everyone sticks to that process
- Involve stakeholders in accurate time and right stage in the project to avoid excessive cost and improve their involvement efficiency
- Provide key stakeholders with necessary information in an adequate time prior to the decision making process at defined stages
- Assign appropriate people in the relevant position and at the right level
- Select a proper type of contract which can increase the efficiency of stakeholder involvement
- Enhance relationship with internal project team members and divisions
- Regular communication with external stakeholders to monitor their performance keep them informed about important project issues
- Clarify stakeholder responsibilities during the planning, design and construction phase
- Maintain update by having regular contact with government authorities and keep all key stakeholders inform about changes in rules and regulations
- Integration of, and communication with, operation and maintenance professionals during the planning stage

- Design an effective measurement and feedback system from the early project stages
- Motivate people, create collaborative environment and enhance mutual
- Increase management responsibility to ensure they get involved, control and improve the whole process
- Extend monitoring responsibility of key project members
- Develop mutual agreement for important intellectual property inputs from all stakeholders

8.3 CONTRIBUTION OF THE RESEARCH TO THE THEORY AND PRACTICE

This research establishes a framework to more effectively engage key project members in the project by taking their concerns into serious consideration. It integrates the ideas from different project phases. The outcomes of this research bring a number of contributions to both academia and the construction industry. This section reports on each category of contribution.

Contribution to the Body of Knowledge

The following are brief remarks of how this research contributes to the academic domain:

1. Findings from this research provide a deeper understanding of how the application of stakeholder management and quality management can be facilitated to improve the final quality of building projects.
2. This research presents a new framework (ESIF) that gives a better insight on the influences of effective early decision-making on enhancing SI as well as improving project quality outcomes. It also examines the significance of the initial planning phases of projects and emphasizes on the impacts of strategies and decisions made during these phases on the overall project outputs.

3. It explores how quality concepts can be more effectively implemented in the construction industry based on the application of ESIF, a tool that integrates and incorporates the views of stakeholders on the targeted quality and operational best practice processes to be applied to construction projects.
4. This research provides a list of root causes of quality issues that assist in developing a better method of introducing quality improvement and delivery concepts into construction building projects.

Contribution to the Industry

The outcomes of this study provide a number of contributions to the industry:

1. It emphasizes the apparent role of key project stakeholders in determining the ultimate levels of quality to be derived from residential construction projects. Findings from this research bring out the point that project leaders should apply the best decision-making strategies during the project planning process in order to increase the effectiveness and efficiency of the involvement of key stakeholders during the whole PLC.
2. By grouping and enhancing mutual stakeholder needs and requirements in the initial project planning stages, ESIF reduces or eliminates the potential conflicts among stakeholders in the design and construction stages.
3. Assessment of stakeholder experience and expertise and involving people with the relevant capability at appropriate stages in the project, will decrease the probability of many managerial and technical quality issues later in the PLC.
4. Findings from this study enhance the communication between project members, and utilise and ensure the commitment of people that contributes to reducing rework, avoids excessive costs and achieve higher quality delivery outcomes.

5. Outcomes of this research provide managers and owners of building projects with the required information and strategic direction to achieve their own, and their stakeholders', main targets and goals of achieving high quality outcomes on their projects.

8.4 LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

Too (2009) reported the limitations of each project will clarify the context of the findings and serve as directions for future researches , so they need to be acknowledged. The limitations related to this research are briefly outlined as follows:

- The survey conducted in this research used only perceptions of four stakeholder groups including 'owner, developer', 'construction/project management, 'designers' and 'contractors'. Taking into account the perspectives of other project members such as, subcontractors, suppliers and surrounding social environment could provide a more complete picture of involvement level in the whole community of stakeholders.

- The case studies conducted in this research used the interview method to collect the required data. This study determined the main principles for enhancing the effective involvement of stakeholders of high-rise and medium-rise residential building projects only. This was narrowed to the perspectives of selected staff from the management level of the chosen cases. However, the validation process extended the circle of people to engage wider range of stakeholders who has been involved in other types of residential projects. This increased the validity of ESIF factors.

This research provided some valuable understanding about the issue of poor stakeholder involvement during the decision-making process and as a result low level of contribution in other phases of PLC. However, further investigations are still required to improve the complex problems. The above-mentioned limitations provide some recommendations for potential future studies.

- The main focus of this research was on high-rise and medium-rise residential building projects. It is suggested that further research uses the outputs of this study as a fundamental for the application of ESIF to incorporate results from an examination that includes other types of building projects.

- The ESIF is developed based on the data collected from selected projects in Queensland. Further studies may be undertaken to test the framework in other locations in Australia or globally.

- Data in both survey and case studies were collected from four group of stakeholders including 'owner, developer', 'construction/project management, 'designers' and 'contractors. It is recommended that future research could focus on the role of other stakeholders of residential building projects.

- Future research can examine from experts whether they agree with the potential improvement in quality issues and to what extent.

- The interview analysis revealed the significance of the contract type in improving the efficiency of stakeholder's engagement. It is suggested that further research focus on the impact of different contract types in improving ESI.

8.5 FINAL SUMMARY

This research attempts to propose processes, strategies and a tool to improve project quality outputs through more effective involvement of key stakeholders. It was found that the impact of stakeholders on building project quality is significant. Therefore, project leaders and owners should adopt improved decision-making strategies and design a plan to enhance the effectiveness of SI from the beginning of the project to its completion stages. The ESI framework presented in this research consists of two main sections, one for establishing the fundamental steps of effective involvement, and the other supporting the mechanism of involvement that together form a comprehensive structure to extend the SI on residential construction projects. This framework will make building project owners more aware of the significance

and function of early decision-making in contributing to achieving higher quality delivery in their project.

Bibliography

Aaltonen, K. and J. Kujala. 2010. A project lifecycle perspective on stakeholder influence strategies in global projects. *Scandinavian Journal of Management, Elsevier* 26:381-397.

Abdelsalam, H. M. E. and M. M. Gad. 2009. Cost of quality in Dubai: an analytical case study of residential construction projects. *International Journal of Project Management, Elsevier* 27 (5):501-511.

Abdul-Kadir, M. R. and A. D. F. Price. 1995. Conceptual phase of construction projects. *International Journal of Project Management* 13 (6):387-393.

Abdul-Rahman, H., C. L. Kwan and P. C. Woods. 1999. Quality function deployment in construction design: application in low cost housing design. *International Journal of Quality & Reliability Management* 16 (6):591-605.

Abel, K., M. Gillenwater and J. Mangino. 2003. Quality assurance and quality control, eds. C. M. L. Cabrera and L. A. Meyer, 17.

Abowitz, D. and T. Toole. 2010. Mixed method research: fundamental issues of design, validity, and reliability in construction research. *Journal of Construction Engineering and Management* 136:108-116.

Achterkamp, M. C. and J. F. J. Vos. 2008. Investigating the use of the stakeholder notion in project management literature, a meta-analysis. *Elsevier, International Journal of Project Management* 26:749-757.

Adams, J., H. Khan, R. Raeside and D. White. 2007. *Research methods for graduate business and social science students*. SAGE Publications.

Adenuga, O. A. 2013. Factors affecting quality in the delivery of public housing projects in Lagos State, Nigeria. *International Journal of Engineerign and Technology* 3 (3):332-344.

Ahadzie, D. K., D. G. Proverbs and P. O. Olomolaiye. 2008. Model for predicting the performance of project managers at the construction phase of mass house building projects. *Journal of Construction Engineering and Management* 134 (8):618-629.

Aje, I. 2012. The impact of contractors' prequalification on construction project delivery in Nigeria. *Engineering, Construction and Architectural Management* 19 (2):159-172.

Al-Najjar, J. M. 2008. Factors Influencing Time and Cost Overruns on Construction Projects in the Gaza Strip, Construction Management, The Islamic University of Gaza.

Amoroso, D. L., R. L. Thompson and P. H. Cheney. 1989. Examining the duality of I.S. executives: a.stady of IS issues. *Information and Management* 17 (1):1-12.

Andersen, E. S., D. Birchall, S. A. Jessen and A. H. Money. 2006. Exploring project success. *Baltic Journal of Management* 1 (2):127-147.

Anderson, S. D. 1992. Project quality and project managers. *International Journal of Project Managemen* 10 (3):138-144.

Anderson, T. 2009. PM@UTS Guide to Project Management. Sydney.

Applebaum, R., B. Schneider, S. Kunkel and S. Davis. 2004. A Guide to quality in consumer directed services. *Miami University*.

Arditi, D. and H. M. Gunaydin. 1997. Total quality management in the construction process. *International Journal of Project Management* 15 (4):235-243.

Arditi, D. and H. M. Gunaydin. 1998. Factors that affect process quality in the lifecycle of building projects. *Journal of Construction Engineering and Management, ASCE* 124 (3):194-203.

ASCE. 2000. *Quality in the constructed project: a guide for owners, designers and constructors*. New York: American Society of Civil Engineers.

Assaf, S., A. Al-Hammad and M. Al-Shihah. 1995. The effect of faulty construction on building maintenance. *Building Research and Information* 23 (3):175-181.

Atkin, B. and M. Skitmore. 2008. Stakeholder management in construction. *Construction Management and Economics* 26 (6):549-552.

Auerback, C. F. and L. B. Silverstein. 2003. *Qualitative research: An introduction to coding and analysis*. New York, USA: New York University Press.

Baker, S. E. and R. Edwards. 2013. *How many qualitative interviews is enough?* : National Centre for Research Methods.

Bal, M., D. Bryde, D. Fearon and E. Ochieng. 2013. Stakeholder Engagement: Achieving Sustainability in the Construction Sector. *Sustaiability Journal* 6:695-710.

Barrett, P. 2000. Systems and relationships for construction quality. *International Journal of Quality & Reliability Management* 17:377-392.

Baruch, Y. 1999. Response Rate in Academic Studies-A Comparative Analysis. *SAGE Publication* 52 (4).

Basu, R. 2013. Managing quality in projects: An empirical study. *International Journal of Project Managemen, Elsevier* In Press.

Bazeley, P. 2007. *Qualitative data analysis with Nvivo*. London: Sage Publication.

Bazely, P. 2007. *Qualitative Data Analysis with NVivo*. London: SAGE Publication.

Belout, A. and C. Gauvreau. 2004. Factors influencing project success: the impact of human resource management. *International Journal of Project Management* 22 (1-11).

Bhimaraya, A. M. 2005. TQM critical success factors for construction firms. *Managament* 10:61-72.

Boddy, D. 2002. Managing projects,building and leading the team. Edinburgh: Financial Times Prentice Hall.

Bosher, L., A. Dainty, P. Carrillo, J. Glass and A. Price. 2007. Integrating disaster risk management into construction: a UK perspective. *Journal of Building Research & Information* 35 (2):163-177.

Bourne, L. and D. T. H. Walker. 2005. Visualising and mapping stakeholder influence. *Management Decision* 43 (5):649-660.

Brian, A. and S. Martin. 2008. Stakeholder management in construction. *Construction Management and Economics* 26 (6):549-552.

Briner, W., C. Hastings and M. Geddes. 1997. *Project leadership*.

Bryman, A. and D. Cramer. 2009. *Quantitative data analysis with spss 14,15 and 16: a guide for social scientists*. Sussex.

Bryman, A. and M. A. Hardy. 2009. *Hand book of data analysis*. Sage Publication.

Bubshait, A. A. 1994. Owner involvement in project quality. *International Journal of Project Managemetn* 12 (2):115-117.

Burns, R. 1997. *Introduction to research method*. Ed. r. ed. Melbourne: Longman.

Carrillo, P. 2004. Managing knowledge: lessons from the oil and gas sector. *Construction Management and Economics* 22 (6):631-642.

Chan, A. P. C. and C. M. Tam. 2000. Factors affecting the quality of building projects in Hong Kong. *international Journal of Quality & Reliability Management* 17:423-441.

Cheng, E., H. Li, P. Love and Z. Irani. 2001. Network communication in the construction industry. *Corporate Communications: An International Journal* 6 (2).

Cheng, E., H. Li, P. Love and Z. Irani. 2004. Strategic alliances: a model for establishing long-term commitment to inter-organizational relations in construction. *Building and Environment* (39):459-468.

Chew, Y. and L. Chai. 1996. *ISO 9002 in malaysian construction industry.*: McGraw Hill

Chung, H. W. 1999. *Understanding quality assurance in construction*. London.

Cleland, D. I. 1999. *Project Management -Strategic Design and Implementation*. 3rd ed. New York: McGraw-Hill.

Cleland, D. I. and L. R. Ireland. 2006. *Project management: strategic design and implementation*. Ed. M.-H. s. AccessEngineering. 5th ed. New York: McGraw-Hill, McGraw-Hill Osborne Media.

Cleland, D. J. 1995. Project management strategic design and implementation.

Coffey, V. 2011. Quality management in construction projects. *Construction Management and Economics* 29 (12):1244-1246.

Cole, R. J. 2005. Building environmental assessment methods: redefining intentions and roles. *Journal of Building Research & Information* 33 (5):455-467.

Cornick, T. C. 1988. Quality management model for building projects. *Project Management Journal* 6 (4):211-216.

Dale, B. G. 2003. *Managing quality (3rd ed)* Oxford: Blackwell.

Dalela, S. 2001. *Quality systems*. Nem Chand Jain

Deming, W. E. 1986. Out of the crisis. *Massachusetts Institute of Technology, Center for Advanced Engineering Study*.

Denzin, N. K. and Y. S. Lincoln. 2000. *Handbook of qualitative research*. London: Sage Publications.

Doloi, H. 2013. Cost overruns and failure in project management: understanding the roles of key stakeholders in construction projects. *Journal of Construction Engineering and Management, ASCE* 139 (3):267-279.

Drew, D. and M. Skitmore. 1997. The effect of contract type and contract size on competitiveness in construction contract bidding

489. *Construction Management and Economics* 15 (5):469-489.

Duncan, J., B. Thrope and P. Sumner. 1990. *Quality Assurance in Construction*. UK: Gower Publishing Company.

Dvir, D., T. Raz and A. J. Shenhar. 2003. An empirical analysis of the relationship between project planning and project success. *International Journal of Project Managemen* 21:89-95.

Egan, J. 2002. *Accelerating change: a report by the strategic forum for construction",*. London: CIC.

Egemen, M. and A. N. Mohamed. 2006. Client's need, wants and expectations from contractors and approach to the concept of repetitive works in the Northern Cyprus construction market. *journal of Business and Industrial Marketing* 17:107-118.

Eisenhardt, K. M. 1989. Building theories from case study research. *The Academy of Management Review* 14 (4):532-550.

Eisenhardt, K. M. 2002. *Buidling Theories from Case Study Research*. CA: SAGE

Eisenhardt, K. M. and M. E. Graebner. 2007. Theory building from cases: opportunities and challenges. *Academy of Management Journal* 50 (1):25-32.

El-Gohary, N. M., H. Osman and T. E. Ei-Diraby. 2006. Stakeholder management for public private partnerships. *International Journal of Project Management* 24 (7):595-604.

Elghamrawy, T. and T. Shibayama. 2008. Total quality management implementation in the Egyptian construction industry. *Journal of managemnet in Engineering (ASCE)* 24 (3):156-161.

Elias, A. A. 2012. A system dynamics model for stakeholder analysis in environmental conflicts. *Journal of Environmental Planning and Management* 55 (3):387-406.

Emmitt, S. and C. Gorse. 2003. *Construction communication*. Blackwell Publishing Ltd.

Evan, D. 1995. How to write a better thesis or report. Melbourne, VIC: Melbourne University Press Carlton.

Farooqui, R. U. and S. M. Ahmed. 2009a. A stepping stone to total quality management for construction companies. In *Seventh LACCEI Latin American*

and Caribbean Conference for Engineering and Technology, San Cristobal, Venezuela, June, 9.

Fellows, R. and A. Liu. 2008. *Research methods for construction*. Blackwell Publishing Ltd.

Ferguson, H. and L. Clayto. 1988. Quality in the Constructed Project: A Guideline for Owners, Designers and Constructors. *ASCE* 1.

Fernandez, W. D. 2004. Using the Glaserian approach in grounded studies of emerging business practices. *Electronic Journal of Business Research Methods* 2 (2):83-94.

Field, A. 2009. *Discovering statistics using SPSS*. Ed. T. ed. London: SAGE Publications.

Fink, A. 2008. *How to conduct surveys*. Ed. r. edn. New Delhi: Sage.

Fink, A. 2009. *How to conduct surveys: A step-by-step guide*. Ed. F. ed: SAGE Publications.

Fink, A. 2010. Survey research methods. *Elsevier Ltd*:152-160.

Forcada, N., M. Macarulla, A. Fuertes, M. Casals, M. Gangolells and X. Roca. 2012. Influence of building type on post-handover defects in housing. *Journal of Perfomance of Constructed Facilities* 26 (4):433-440.

Forcada, N., M. Macarulla and P. E. D. Love. 2013. Assessment of residential defects at post-handover. *Journal of Construction Engineering and Management, ASCE* 139:372-378.

Freeman, E. and J. McVea. 2001. *A stakeholder approach to strategic management*. Ed. T. B. H. o. S. Management. Oxford: Blackwell Business.

Freeman, R. 1984. Strategic management: a stakeholder approach

Frimpong, Y., J. Oluwoye and L. Crawford. 2003. Causes of delay and cost overruns in construction of groundwater projects in developing countries: Ghana as a case study. *International Journal of project Management* 21 (5):321-326.

Gable, G. G. 1994. Integrating case study and survey research methods: an example in information systems. *Journal of Information Systems* 3 (2):112-126.

Gao, S. S., J. Jane and J. J. Zhang. 2006. Stakeholder engagement, social auditing and corporate sustainability. *Business Process Management* (12):722-740.

Georgiou, J., P. E. D. Love and J. Smith. 1999. A comparison of defects in houses constructed by owners and registered builders in the Australian State of Victoria. *Structural survey* 17 (3):160-169.

Gilmore, H. L. 1974. Product conformance cost. *Quality Progress* 7 (5):16-19.

Globerson, S. and O. Zwikael. 2002. Impact of the project manager on project management planning processes. *Project Management Journal* 33 (3):58-64.

Golafshani, N. 2003. Understanding Reliability and Validity in Qualitative Research. *The Qualitative Report* 8 (4):597-607.

Gransberg, D. D. and K. Molenaar. 2004. Analysis of Owner's Design and Construction Quality Management Approaches in Design/Build Projects. *Journal of Management in Engineering, ASCE*.

Grbich, C. 2007. *Qualitative data analysis: An introduction*. Ed. T. Oaks. CA: Sage Publication.

Griffith, A. and A. C. Sidwell. 1997. Development of constructability concepts, principles and practices. *Journal of Engineering, Construction and Architectural Management* 4:295-310.

Hahn, C. 2008. *Doing qualitative research using your computer: A practical guide*. Sage Publications.

Hall, P. A. 2006. Systematic process analysis: when and how to use it. *European Management Review* 3:24-31.

Harvey, M. 2001. *Undermining Construction: The Corrosive Effects of False Self-Employment*. London: The Institute of Employment Rights.

Haupt, T. C. and D. F. Whiteman. 2003. Implementing total quality management on construction sites. *The TQM Magazine* 16 (3):166-173.

Hirao, S. 1994. Management and quality - as the basis of continuous improvement of the competitiveness of takenata corporation. *Quality Management in Building and Construction*:20-28.

Hirshheim, R. A. and H. K. Klein. 1989. Four paradigms of information system development. *Communications of the ACM* 32 (10):1199-1216.

Hiyassat, M. A. S. 2000. Applying the ISO standard to a construction company: A case study. *Elsevier, International Journal of Project Management* 18:275-280.

Hoezen, M., I. Reymen and G. Dewulf. 2006. *The problem of communication in construction*. Netherland: University of Twente.

Howes, R. and H. Robinson. 2005. *Infrastructure for the built environment : global procurement strategies*. Burlington: Butterworth-Heinemann.

Hoyle, D. 2009. *ISO 9000 Quality system handbook - Using the Standards as a Framework for Business Improvement (6th Edition)*. Taylor&Francis.

Hughes, R. 1998. Environmental impact assessment and stakeholder involvement. London.

Hurmerinta-Peltomaki, L. and N. Nummela. 2006. Mixed methods in international business research: A valua added perspective. *Management International Review* 46 (4):439-459.

Hwang, B.-G. and E.-S. J. Lim. 2013. Critical success factors for key poject players and objectives: case study of singapore. *Journal of Construction Engineering and Management, ASCE* 139:204-215.

IFC. 2007. Stakeholder engagement: A good practice handbook for companies doing business in emerging market. Washington.

ISO. 2005. *Quality management systems Fundamentals and vocabulary*.

Jaapar, A., I. R. Endut, N. A. A. Bahri and RoshanaTakim. 2009. The impact of value management implementation in Malaysia. *Journal of Sustainable Development* 2 (2).

Jafari, A. and P. E. D. Love. 2013. Quality Costs in Construction: The Case of the Qom Monorail Project in Iran. *Journal of Construction Engineering and Management, ASCE* In Press.

Jamieson, A. and P. Morris. 2008. *Implementing strategy through programmes or projects*. Gower Publishing.

Jha, K. N. and K. C. Iyer. 2006. Critical factors affecting quality performance in construction projects. *Total Quality Management* 17 (9):1155-1170.

Jha, K. N. and K. C. Iyer. 2007. Commitment, coordination, competence and the iron triangle. *international Journal of Project Management* (25):527-540.

Joaquin, D., D. Hernandez and E. Aspinwall. 2008. A framework for building quality into construction projects- Part I. *Total Quality Management* 19 (10):1013-1028.

Joaquin, D., D. Hernandez and E. Aspinwall. 2010. A framework for building quality into construction projects- Part II. *Total Quality Management* 21 (7):725-736.

Johnson, G. and K. Scholes. 1999a. Exploring Corporate Strategy. London.

Johnson, G. and K. Scholes. 1999b. *Exploring Corporate Strategy*. Prentice Hall Europe.

Jones, T. and A. Wicks. 1999. Convergent stakeholder theory. *Academic of Management Review* 24 (2):206-221.

Jones, T. M. 1995. Instrumental stakeholder theory: a synthesis of ethics and economics. *Academy of Management Review* 20 (2):404-437.

Josephson, P. E. and Y. Hammarlund. 1999. The causes and costs of defects in construction :A study of seven building projects. *Automation in Construction, Elsevier* (8):681-687.

Juran, J. and J. D. Feo. 2010. *Juran's quality handbook: The complete guide to performance excellence (6th ed)*. McGraw-Hill.

Juran, J. M. 1989. Juran on leadership for quality, an executive handbook.

Juran, J. M. and A. B. Godfery. 1999. *Juran's Quality Handbook*. Vol. 5. New York: McGraw-Hill.

Kalantari, H., E. Kalantari and S. Malekic. 2011. E-survey (surveys based on e-mail & web). *Elsevier,Procedia Computer Science* (3):935-941.

Kanji, G. K. and A. Wong. 1998. Quality culture in the cunstruction industry. *Total Quality Management* 9:133-140.

Kartam, N. A. 1997. Making effective use of construction lessons learned in project life cycle. *Journal of Construction Engineering and Management* 122 (1):14-21.

Kazaz, A. and M. T. Birgonul. 2004. The evidence of poor qualityin high rise and medium rise housing units: a case studyof mass housing projects in Turkey. *Elsevier, Building and Enviroment* 40:1548-1556.

Kerzner, H. 2013. *Project management: A system approach to planning, scheduling and controling*. 11th ed: John Wiley & Sons.

Koh, T. Y. and S. P. Low. 2010. Empiricist framework for TQM implementation in construction companies. *Journal of Managemnet in Engineering* 26 (3):133-143.

Kolk, A. and J. Pinkse. 2006. Stakeholder mismanagement and corporate social responsibility crises. *European Management Journal* 24 (1):59-72.

Kolltveit, B. J. and K. Grønhaug. 2004. The importance of the early phase: the case of construction and building projects. *International Journal of Project Management, Elsevier* 22:545-551.

Lam, K. C., T. Hu, M. Skitmore and S. O. Cheung. 2001. A fuzzy neural network approach for contractor prequalification. *Construction Management and Economics* 19 (2):243-266.

Lam, S. S. K. 1997. Quality planning performance: The relationship between objectives and process. *International Journal of Quality and Reliability Management* 14 (1):10-23.

Laufer, A. and R. L. Tucker. 1987. Is construction project planning really doing its job? A critical examination of focus, role and process. *Construction Management and Economics* 5 (3):243-266.

Lee, K.-L. and S. Yang. 2012. Applying six sigma to quality improvement in construction. *Journal of Management in Engineering, ASCE* In Press.

Leonard, D. 2008. Quality manegement practices in the US homebuilding industry. *The TQM Journal* 22 (1):101-110.

Leszaka, M., D. E. Perryb and D. Stoll. 2002. Classification and evaluation of defects in a project retrospective. *The Journal of Systems and Software* 61:173-187.

Leung, M.-Y., A. Chong, S. T. Ng and M. C. K. Cheung. 2003. Demystifying stakeholders' commitment and its impacts on construction projects. *Construction Management and Economics* (22):701-715.

Leung, M.-y., J. Yu and Q. Liang. 2013. Improving Public Engagement in Construction Development Projects from a Stakeholder Perspective. *Journal of Construction Engineering and Management*.

Levy, P. S. and S. Lemeshow. 1999. *Sampling of Populations: Methods and Applications*. New York: John Wiley and Sons.

Levy, P. S. and S. Lemeshow. 2008. *Sampling of Population- Methods and Application*. Hoboken, New Jersey: John Wiley & Sons.

Li, T., T. Ng and M. Skitmore. 2013. Evaluating stakeholder satisfaction during public participation in major infrastructure and construction projects: A fuzzy approach. *Automation in Construction, Elsevier* 29:123-135.

Lincoln, Y. S. and E. G. Guba. 1985. *Naturalistic inquiry*. California-USA: SAGE Publications.

Ling, F., S. Low, S. Wang and T. Egbelakin. 2008. Models for predicting project performance in China using project management practices adopted by foreign

AEC firms. *Journal of Construction Engineering and Management* 134 (12):983-990.

Love, E. and H. Li. 2000. Quantifying the causes and costs of rework in construction. *Journal of Construction Management Economic* 18 (4):479-490.

Low, S. P. and S. H. Hong. 2005. Strategic quality management for the construction industry. *The TQM Magazine* 17 (1):35-53.

Marosszeky, R. T. M., K. Karim, S. David and D. McGeorge. 2002. The importance of project culture in achieving quality outcomes in construction. In *IGLC, Brazil*.

Masrom, A. N. 2012. Developing a predictive contractor satisfaction model (CoSMo) for construction projects. PhD, Queensland University of Technology, Australia.

McIntyre, C. and M. Kirschenman. 2000. Survey of TQM in construction industry in upper midwest. *Journal of managemnet in Engineering (ASCE)* 16 (5):67-70.

Meredith, J. R. and S. J. Mantel. 2012. *Project management - a managerial approach (8th ed)*. Ed. t. Ed. 6th ed. New York: Wiley.

Meyer, M. H. and J. M. Utterback. 1995. Product development cycle time and commercial success. *IEEE, Transactions on Engineering Management* 42 (4):297-304.

Miles, M. B. and A. M. Huberman. 1994. *Qualitative data analysis*. Ed. n. ed. CA: Sage Publications.

Miller, R. and D. Lessard. 2001. Understanding and managing risks in large engineering projects. *International Journal of Project Management* 19:437-443.

Miller, R. and X. Olleros. 2001. Project shaping as a competitive advantage. *The strategic management of large engineering projects: shaping institutions, risks, and governance*.

Mills, A., P. Love and P. Williams. 2009. Defect costs in residential construction. *Journal of Construction Engineering and Management, ASCE* 135 (1):12-16.

Mohammed, A. H. b. and M. N. b. Abdullah. 2006. Quality management system in construction. In *ICCI, Johor Bahru Johor, Malaysia*.

Moody, D. L. 2005a. Theoretical and practical issues in evaluating the quality of conceptual model: current state and future directions. *Data and Knowledge Engineering. Elsevier* 55:243-276.

Moody, D. L. 2005b. Theoretical and practical issues in evaluating the quality of conceptual models: current state and future directions. *Data and Knowledge Engineering. Elsevier* (55):243-276.

Morse, J. M., M. Barrett, M. Mayan, K. Olson and J. Spiers. 2002. Verification strategies for establishing reliability and validity in qualitative research. *International Journal of Qualitative Methods* 1 (2).

Morse, J. M. and L. Richards. 2002. *Readme first: For a user's guide to qualitative methods.* London: Sage Publication.

Morse, J. M., J. M. Swanson and A. J. Kuzel. 2001. *Qualitative verification: building evidence by extending basic findings*. Thousand Oaks: SAGE Publications, Inc.

Moura, H. M. and J. C. Teixeura. 2010. Managing stakeholders conflicts. In *Construction Stakeholder Management*, 286-316. U.K.: Blackwell Publishing.

Mshelbwala, T. 2005. Prequalification/selection of consultants/contractors under "Due process". In *Proceedings of the Annual General Meeting and Conference of the Nigerian Institute of Building on "Due Process" and the Construction Industry, Nigeria*, 13-22.

Mutafelija, B. and H. Stromberg. 2003. *Systematic process improvement using ISO 9001:2000 and CMMI*. Norwood.

Naoum, S. G. 2007. *Dissertation research and writing for construction students*. Butterworth: Heinemann.

Naoum, S. G. and F. H. Mustapha. 1995. Influences of the client designer and procurement method on project performance. In *CIB W92 Symposium "East meets West"*, 221-228.

Neuman, W. L. 2006. *Social research methods: qualitative and quantitative approaches*. *6th ed*. Boston: Pearson Education.

Newcombe, R. 2003. From client to project stakeholders:a stakeholder mapping approach. *Construction Management and Economics* 21 (841-848).

Nguyen, L. D., S. O.Ogunlana and D. T. X. Lan. 2004. A study on project success factors in large construction projects in Vietnam. *Emerald, Engineering, Construction and Architectural Management* 11 (6):404-413.

Nguyen, N. H., M. Skitmore and J. K. W. Wong. 2009. Stakeholder impact analysis of infrastructure project management in developing countries : a study of perception of project managers in state-owned engineering firms in Vietnam. *Journal of Construction Management and Engineering* 27 (11):1129-1140.

Nonoka, I. and H. Takeuchi. 1995. *The Knowledge Creating Company: How Japanese Companies Create the Dynamics of Innovation*. New York, NY: Oxford University Press.

NVIVO. 2010. Nvivo qualitative data analysis software. http://www.qsrinternational.com/products_nvivo.aspx.

O'leary, X. 2004. *The essential guide to doing research*. Sage Publication.

Olander, S. 2002. Consensual approaches to siting controversy. *Construction Innovation and Global Competitiveness* 2:909-920.

Olander, S. 2006. External stakeholder analysis in construction project management. PhD Thesis, Lund University, UK.

Olander, S. 2007. Stakeholder impact analysis in construction project management. *Construction Management and Economics* 25 (3):277-287.

Olander, S. and A. Landin. 2005a. Evaluation of stakeholder influence in the implementation of construction projects. *Elsevier, International Journal of Project Management* 23 (4):321-328.

Olander, S. and A. Landin. 2005b. Evaluation of stakeholder influence in the implementation of construction projects. *International Journal of Project Management* 23 (4):21.

Olander, S. and A. Landin. 2008. A comparative study of factors affecting the external stakeholder management process. *Construction Management and Economics* 26 (6):553-561.

Olian, J. D. and S. L. Rynes. 1992. Making total quality work: aligning organizational processes, performance measures, and stakeholders. *HUman resource management* 30 (3):303-333.

Ortega, I. and S. Bisgaard. 2000. Quality improvement in the construction industry: three systematic approaches. *Total Quality Management* 11:383-392.

Pajunen, K. 2006. Stakeholder influences in organisational survival. *Journal og Management Studies* (43).

Parasuraman, A., V. A. Zeithaml and L. L. Berry. 1985. A conceptual model of service quality and its implications for future research. *Journal of Marketing* 4 (4):41-50.

Parteous, W. A. 1992. Classifying building failure by cause. *Building Research and Information* 20 (6):350-356.

Patton, M. Q. 2002a. *Qualitative evaluation and research methods*. Ed. 3, *Thousands Oaks*. CA: Sage Publications.

Patton, M. Q. 2002b. *Qualitative research&evaluation methods*. Sage Publication.

Payne, G. and P. Judy. 2004. *Key concepts in social research*. London: Sage Publications.

Peter F. Kamig , P. O. O., Gary D. Holt, Frank C. Harris. 1997. Factors infuencing construction time and cost overruns on high-rise projects in Indonesia. *Construction Management and Economics* (15):83-94.

Pheng, L. S. and G. K. Hwa. 1994. Construction Quality Assurance: Problems of Implementation at Infancy Stage in Singapore. *International Journal of Quality & Reliability Management* 11 (1):22-37.

Pheng, L. S. and D. Wee. 2001. Improving maintenance and reducing building defects through ISO 9000. *Journal of Quality in Maintenance Engineering* 7 (1):6-22.

Pheng, L. S. and P. K.-. Wei. 1996. A framework for implementing TQM in construction. In *TQM*.

Phillips, R. 2003. *stakeholder theory and organisational ethics*. San Francisco: Berrett-Koehler Publishers Inc.

Pinsonneault, A. and K. L. Kraemer. 1993. Survey research methodology in management information systems: An assessment. *Journal of Management Information Systems* 10 (2):75-105.

Pinto, J. K., D. P. Slevin and B. English. 2009. An empirical assessment of owner/contractor relationships. *International Journal of Project Managemen* 27 (6):638-648.

PMI. 2008a. *A guide to the project management body of knowledge (PMBOK Guide)*: Project Management Institute.

PMI. 2008b. *A guide to the project management body of knowledge(PMBOK Guide)*. USA: Project Management Institute.

PMI. 2013. *A guide to the project management body of knowledge (PMBOK), Fifth Edition*. Project Management Institute (PMI).

Porteous, W. A. 1992. Classifying building failure by cause. *Building Research and Information* 20 (6):350-356.

Post, J. E., L. E. Preston and S. Sachs. 2002. *Redefining the corporation:stakeholder management and organizational wealth*. Stanford: Stanford University Press.

R.Dainty, A., S. G.Ison and D. S.Root. 2004. Bridging the skills gap: a regionally driven strategy for resolving the construction labour market crisis. *Construction and Architectural Management* 11 (4):275-283.

Rakich, J. S. 2000. Strategic quality planning. *Hospital Topics* 78 (2):5-11.

Rea, L. M. and R. A. Parker. 2005. *Designing and conducting survey research*. San Francisco: Jossey-Bass.

Richards, L. and J. Morse. 2007. *Readable first for a user's guide to qualitative methods*. Ed. T. Oaks. CA: SAGE Publications.

Ross, J. P. 1989. Taguchi techniques for quality engineering.

Rumane, A. R. 2010. *Quality management in construction projects*. CRC Press.

Russell, R. S. and B. W. Taylor. 2003. *Operations Management*. 4th ed. New Jersey: Pearson Education.

Saghatforoush, E., B. Trigunarsyah and E. Too. 2013. Extension of constructability to include operation and maintenance for infrastructure projects. PhD, Civil Engineering and Built Environment, QUT.

Saghatforoush, E., B. Trigunarsyah, E. Too and A. HeraviTorbati. 2010. Effectiveness of constructability concept in the provision of infrastructure assets. In *eddBE 2011 Conference Queensland University of Technology, Brisbane, Australia, April 2011*.

Saldana, J. 2009. *The coding manual for qualitative researchers*. Sage Publications.

Sanvido, V., F. Grobler, K. Parfitt, M. Guvenis and M. Coyle. 1992. Critical success factors for construction project. *Journal of Construction Engineering and Management, ASCE* 118 (1):94-111.

Sarantakos, S. 1998a. *Social Research*. 2nd ed. Melbourne: MacMillan Educational.

Sarantakos, S. 1998b. Working with social research: Palgrave Macmillan.

Saraph, J. V., P. G. Benson and R. G. Schroeder. 1989. An instrument for measuring the critical factors of quality management. *Decision Science* 20.

Saunders, M., P. Lewis and A. Thornhill. 2009. *Research method for business students*. Prentice Hall.

Seaver, M. 2001. Implementing ISO 9000:2000.

Sekaran, U. and R. Bougie. 2009. *Research methods for busines: A skill-building approach*. Ed. F. ed. Chichester-UK: Wiley.

Senaratne, S. and T. Jayarathna. 2012. Quality planning process of construction contractors: case studies in Sri Lanka. *Journal of Construction in Developing Countries* 17 (1):101-114.

Serpell, A. 1999. Integrating quality systems in construction projects: the Chilean case. *Elsevier, International Journal of Project Management* 17 (5):317-322.

Sharp, H., A. Finkelstein and G. Galal. 1999. Stakeholder Identification in the Requirements Engineering Process: IEEE Conference Publication.

Sigglekow, N. 2007. Persuasion with case studies. *Academy of Management Journal* 50:20-24.

Soetanto, R., D. G. Proverbs and G. D. Holt. 2001. Achieving quality construction projects based on harmonious working relationships. *international Journal of Quality & Reliability Management* 18 (5):528-548.

Sommerville, J. and J. McCosh. 2006. Defects in new homes: an analysis of data on 1,696 new UK houses. *Structural Survey* 24 (1):6-21.

SPSS. 2010. SPSS Inc. http://www.spss.com/.

Stenbacka, C. 2001. Qualitative research requires quality concepts of its own. *Management Decision* 39 (7):551-556.

Stoney, C. and D. Winstanley. 2001. Stakeholding: confusion or utopia? Mapping the conceptual terrain. *Journal of Management Studies* 35 (5):603-626.

Sunil M. Dissanayaka, M. M. K. 1999. Evaluation of factors affecting time and cost performance in Hong Kong building projects. *Engineering, Construction and Architectural Management* 6 (3):287-298.

Sutrisna, M. 2009. Research methodology in doctoral research: understanding the meaning of conducting qualitative research. In *Paper presented at the Association of Researchers in Construction Management (ARCOM) Doctoral Workshop,, Liverpool-UK*.

Tabish, S. Z. S. and K. N. Jha. 2011. Identification and evaluation of success factors for public construction projects. *Construction Management and Economics* 29 (8):809-823.

Tam, V. W. Y., L. Y. Shen and J. S. Y. Kong. 2011. Impacts of multilayer chain subcontracting on project management performance. *International Journal of Project Management, Elsevier* 29 (1):108-116.

Tang, W., M. Qiang, C. F. Duffield, D. M. Young and a. Y. Lu. 2009a. Enhancing total quality management by partnering in construction. *Journal of Professional Issues in Engineering Education and Practice, ASCE*:129-141.

Tang, W., M. Qiang, C. F. Duffield, D. M. Young and Y. Lu. 2009b. Enhancing Total Quality Management by Partnering in Construction. *Journal of Professional Issues in Engineering Education and Practice (ASCE)* 135 (4):129-141.

Thomson, D. 2011. A pilot study for client complexity, emergent requirements and stakeholder perceptions of project success. *construction Management and Economics* 29 (1):69-82.

Toakley, A. R. and M. Marosszeky. 2003. Towards total project quality- a review of research needs. *Journal of Engineering and Architectural Management* 10 (3):219-228.

Too, E. 2009. Capabilities for strategic infrastructure asset management. PhD, Queensland University of Technology, Brisbane.

Trost, S. M. and G. D. Oberlender. 2003. Predicting accuracy of early cost estimates using factor analysis and multivariate regression. *Journal of Construction Engineering and Management, ASCE* 129 (2):198-204.

Verbeke, A. and V. Tung. 2013. The future of stakeholder management theory: a temporal perspective. *Journal of Business Ethics* 112 (3):529-543.

Walker, D. H. T. 1994. An investigation into factors that determine building construction time performance. PhD, Royal Melbourne Institute of Technology, Melbourne.

Walker, D. H. T. 2000. Client/customer or stakeholder focus? ISO 14000 EMS as a construction industry case study. *Total Quality Management* 12 (1):18-25.

Wang, X. and J. Huang. 2006. The relationships between key stakeholder's project performance and project success: Perceptions of Chinese construction supervising engineers. *International Journal of Project Management* 24:253-260.

Wateridge, J. 1998. How can IT/IS projects be measured for success. *International Journal of Project Managemetn* 16 (1):59-63.

Watson, T., S. Osborne and M. Longhurst. 2002. Issues negotiation investing in stakeholders. *Corporate Communication: An International Journal* 7 (1):54-61.

Westfall, L. 2008. Sampling Methods. *The Westfall Team*.

Willar, D. 2012. Improving quality management system implementation in Indonesian construction companies. PhD, Civil Engineering and Built Environment, QUT, Australia.

Wilson, I. E. and Y. Rezgui. 2013. Barriers to construction industry stakeholders' engagement with sustainability: toward a shared knowledge experience. *Technological and Economic Development of Economy* 19 (2):289-309.

Winch, G. and S. Bonke. 2002. Project stakeholder mapping: analysing the interests of project stakeholders, 385-403. Manchester: Project Management Institute.

Wolcatt, H. F. 1994. *Transforming qualitative data: discription, analysis and interpretation*. Ed. T. Oaks: Sage Publication.

Wong, A. and P. Fung. 1999. Total quality management in the construction industry in Hong Kong: A supply chain management perspective. *Total Quality Management* 10 (2):199-208.

Wood, M., J. Daly, J. Miller and M. Roper. 1999. Multi-method research: An empirical investigation of object-oriented technology. *Elsevier, The Journal of Systems and Software* 48:13-26.

Wubbenhorst, L. L. 1986. Life cycle costing for construction projects. *Long Range Planning* 19 (4):87-97.

Yang, H., J. F. Y. Yeung, A. P. C. Chan, Y. H. Chiang and D. W. M. Chan. 2010. A critical review of performance measurement in construction. *Journal of Facilities Management* 8 (4):269-284.

Yang, J. 2010. Stakeholder management in construction: An empirical study to address research gaps in previous studies. *Elsevier, International Journal of Project Management*.

Yang, J. B. and S. C. Pheng. 2008. Development of customer satisfaction evaluation model for construction project management. *Building and Environment* 43 (4):458-468.

Yin, R. K. 2003. *Case study method: design and research*. 5th ed. London: Sage Publication.

Yin, R. K. 2009. *Case study research: design and methods*. Vol. 5, *4 ed*: Sage Publications.

Yin, R. K. and K. A. Heald. 1975. Using the case survey method to analyze policy studies. *Administrative Science Quarterly* 20 (3):371-381.

Yu, A. T. W., Q. Shen, J. Kelly and K. Hunter. 2006. Investigation of critical success factors in construction project briefing by way of content analysis. *Journal of Construction Engineering and Management, ASCE* 132 (11):1178-1186.

Yung, P. and B. Yip. 2010. Construction quality in China during transition: A review of literature and empirical examination. *International Journal of Project Managemetn* 28:79-91.

Zikmund, W. G., B. J. Babin, J. C. Carr and M. Griffin. 2000. *Business research methods*. Vol. 6: Dryden Press Fort Worth.

Zou, P. X. W., G. Zhang and J. Wang. 2007. Understanding the key risks of construction projects in China. *International Journal of Project Management, Elsevier* 25 (6):601-614.

Zwikael, O. 2009. Critical planning processes in construction projects. *Construction Innovation* 9 (4):372-387.

Appendices

Appendix A

Participant Information Sheet and Consent Form for Questionnaire Survey

Queensland University of Brisbane Australia

PARTICIPANT INFORMATION FOR QUT RESEARCH PROJECT

Improving Construction Management:
An investigation into the influences of stakeholder management on construction project quality

QUT Approval Number 1200000063

RESEARCH TEAM

Principal Researcher: Amirhossein Heravitorbati, PhD Candidate, QUT amirhossein.heravitorbati@qut.edu.au

1st Associate Researcher: Vaughan Coffey, Lecturer, QUT v.coffey@qut.edu.au

2nd Associate Researcher: Bambang Trigunarsyah, Assoc Prof, QUT bambang.trigunarsyah@qut.edu.au

DESCRIPTION

This research is being undertaken as part of a PhD research.

The purpose of this study is to investigate the influences of stakeholder management on building project quality. It focuses on key stakeholder involvement in the planning phase of a project. It evaluates the current level of stakeholder incorporation in the planning phase and examines the influences of such involvement on quality issues often found in building projects. It also observes the approaches for better involvement of stakeholders in the planning phase which ultimately leads to higher project quality delivery in construction building projects. The outcome of this research is an improved framework that will be used to enhance the involvement levels of stakeholders in the construction project planning phase. The framework will be conclusively validated and will facilitate construction companies to achieve better project quality delivery. It is envisaged that after adoption by construction companies, there can be improved outcomes in terms of meeting customer`s needs and requirements.

The research team requests your assistance to participate in this research project by sharing with us your experiences of involvement in project planning within your organisation.

PARTICIPATION

Participation in this project involves filling-in and submitting the online questionnaire and is entirely voluntary. If you do agree to participate, you can withdraw from the project without comment or penalty. Your decision to participate, or not participate, will in no way impact upon your current or future relationship with QUT. If you agree to participate, you are respectfully requested to click on the link provided in the email and fill in an online questionnaire and once finished, submit it. The questionnaire includes 4 main sections and takes approximately 20 minutes of your time. The first section needs some general information about you and your organization. The second and third sections are the main parts of the questionnaire and aim to evaluate your involvement in the initial phase of the project lifecycle and the impact of such involvement on quality issues. It is then followed by the last section (section4) which seeks your opinion on the significance of stakeholders to be involved in the project.

All your comments and responses are anonymous and will be treated confidentially. Your participation is truly valuable and highly appreciated.

EXPECTED BENEFITS

The outcomes of this research are crucial to gaining a better understanding of how stakeholder management and quality concepts can be more effectively implemented in the construction industry based on the application of a considered framework that integrates and incorporates the views of stakeholders as to the targeted quality and operational best practice processes to be applied to construction projects. Findings from this research will

assist in developing a better method of introducing stakeholder involvement, quality improvement and delivery concepts into the construction building projects. These findings will be used to develop a framework and it is intended to improve project quality outputs. The findings of this research will be shared with the interested participants in the form of a report.

RISKS

There are no risks beyond normal day-to-day living associated with your participation in this project.

PRIVACY AND CONFIDENTIALITY

All your comments and responses are anonymous and will be treated confidentially. Any data collected as part of this project will be stored securely as per QUT's Management of research data policy.

CONSENT TO PARTICIPATE

Submitting the completed online questionnaire is accepted as an indication of your consent to participate in this project.

QUESTIONS / FURTHER INFORMATION ABOUT THE PROJECT

If you require any further information about the project, please contact one of the research team members named above.

CONCERNS / COMPLAINTS REGARDING THE CONDUCT OF THE PROJECT

QUT is committed to research integrity and the ethical conduct of research projects. However, if you do have any concerns or complaints about the ethical conduct of the project you may contact the QUT Research Ethics Unit on 3138 5123 or email ethicscontact@qut.edu.au. The QUT Research Ethics Unit is not connected with the research project and can facilitate a resolution to your concern in an impartial manner.

Appendix B

Participant Information Sheet and Consent Form for Interviews

Queensland University of Brisbane Australia

PARTICIPANT INFORMATION FOR QUT RESEARCH PROJECT
– Interview / Focus group –

Improving Construction Management:
An investigation into the influences of stakeholder management on construction project quality

QUT Approval Number 1200000063

RESEARCH TEAM

Principal Researcher: Amir Heravitorbati, PhD Candidate, QUT amir.heravitorbati@student.qut.edu.au

1st Associate Researcher: Dr Vaughan Coffey, Lecturer, QUT v.coffey@qut.edu.au

2nd Associate Researcher: Assoc Prof Bambang Trigunarsyah, QUT bambang.trigunarsyah@qut.edu.au

DESCRIPTION

This research is being undertaken as part of a PhD research.

The purpose of this study is to investigate the influences of stakeholder management on building project quality. It focuses on key stakeholder involvement in the planning phase of a project where 'upstream' decisions are made that have a significant impact on 'downstream' final project outcomes, specifically construction quality. It evaluates the current level of stakeholder incorporation in the planning phase and also examines the significant influences of such involvement on the quality issues of building projects. The study additionally observes approaches for better involvement of stakeholders in the planning phase.

The proposed outcome of this research is development of an improved framework that will be inclusively validated that will enhance the involvement of stakeholders in the planning phase of projects thus in future facilitating construction companies to attain better project quality delivery levels and improved outcomes in terms of meeting customer`s needs and requirements.

The research team requests your assistance to participate in this project by sharing with us your experience of involvement in conceptual planning of projects within your organization.

PARTICIPATION

Your participation in this project is entirely voluntary. If you do agree to participate, you can withdraw from the project without comment or penalty. Your decision to participate, or not participate, will in no way impact upon your current or future relationship with QUT.

Your participation will involve an interview session related to the findings that were obtained from the previous stage (survey). The Interview session will approximately take 40-45 minutes at an agreeable location to you. Audio recording will be used for interview.

EXPECTED BENEFITS

The outcomes of this research are crucial to gaining a better understanding of how stakeholder management and quality concepts can be more effectively implemented in the construction industry based on the application of a considered framework that integrates and incorporates the views of stakeholders as to the targeted quality and operational best practice processes to be applied to construction projects. Findings from this research will assist in developing a better method of introducing stakeholder involvement, quality improvement and delivery concepts into the construction building projects. These findings will be used to develop a framework and it is intended to improve project quality outputs

The findings of this research will be shared with the interested participants on request in the form of an executive industry report.

RISKS

There are no specific risks associated with your participation in this project.

PRIVACY AND CONFIDENTIALITY

All your comments and responses are anonymous and will be treated confidentially.

Any data collected as part of this project will be stored securely as per QUT's Management of research data policy.

A digital recorder will be used to record the interview session and the recordings will be destroyed at the end of the project.

CONSENT TO PARTICIPATE

We would like to ask you to sign a written consent form (enclosed) to confirm your agreement to participate in the research.

QUESTIONS / FURTHER INFORMATION ABOUT THE PROJECT

If you require any further information about the project, please contact one of the research team members named above.

CONCERNS / COMPLAINTS REGARDING THE CONDUCT OF THE PROJECT

QUT is committed to research integrity and the ethical conduct of research projects. However, if you do have any concerns or complaints about the ethical conduct of the project you may contact the QUT Research Ethics Unit on 3138 5123 or email ethicscontact@qut.edu.au. The QUT Research Ethics Unit is not connected with the research project and can facilitate a resolution to your concern in an impartial manner.

Appendix C

Interview Consent From

Queensland University of Brisbane Australia

CONSENT FORM FOR QUT RESEARCH PROJECT
– Interview / Focus group –

Improving Construction Management:
An investigation into the influences of stakeholder management on construction project quality

QUT Approval Number 1200000063

RESEARCH TEAM CONTACTS

Principal Researcher:	Amirhossein Heravitorbati, PhD Candidate, QUT	amirhossein.heravitorbati@qut.edu.au
1st Associate Researcher:	Vaughan Coffey, Lecturer, QUT	v.coffey@qut.edu.au
2nd Associated Researcher:	Bambang Trigunarsyah, Assoc Prof, QUT	bambang.trigunarsyah@qut.edu.au

STATEMENT OF CONSENT

By signing below, you are indicating that you:

Have read and understood the information document regarding this project.

Have had any questions answered to your satisfaction.

Understand that if you have any additional questions you can contact the research team.

Understand that you are free to withdraw at any time, without comment or penalty.

Understand that you can contact the Research Ethics Unit on 3138 5123 or email ethicscontact@qut.edu.au if you have concerns about the ethical conduct of the project.

Understand that the project will include audio recording.

Agree to participate in the project.

Name .....

Signature .....

Date .....

:

Email:
amir.heravitorbati@student.qut.edu.au

Amir Hossein Heravi Torbati
PhD Candidate- Science and Engineering Faculty
Queensland University of Technology,
Australia

Appendix D

Survey Questionnaire

Research Title:

Improving Construction Management: An Investigation into the Influences of Stakeholder Management on Construction Project Quality

RESEARCHER:

Amirhossein Heravi
PhD Candidate
School of Urban Development
Faculty of Built Environment and Engineering
Queensland University of Technology
2 George St GPO Box 2434
Brisbane Qld
4001 Australia
Mobile: +61 411 255 411
Email: amirhossein.heravitorbati@qut.com.au

PRINCIPAL SUPERVISOR:

Doctor Vaughan Coffey
School of Civil Engineering and Built Environment
Queensland University of Technology
Email: v.coffey@qut.edu.au

ASSOCIATE SUPERVISOR:

Associate professor Bambang Trigunarsyah
School of Civil Engineering and Built Environment
Queensland University of Technology
Email: bambang.trigunarsiyah@qut.edu.au

Introduction:

The purpose of this study is to investigate the influences of stakeholder management on building project quality.

Through this survey it evaluates the current level of stakeholder involvement in the project planning processes and examines the influences of better stakeholder involvement on quality issues. This survey also to some extent observes the approaches for better involvement of stakeholders in project that will be widely examined through later interviews.

The outcome of this research is an improved framework that will be used to enhance the involvement levels of stakeholders in the construction project and subsequently achieving higher project quality delivery.
All data will be treated as **strictly confidential.**

SECTION 1- RESPONDENT/ ORGANISATION DETAILS

This section **(Question 1 to 7)** requires information about your background and your organisation. Please tick (√) the most appropriate answer where shown.

1. **What is your current position in your organisation?**_____

2. **How long have you been involved in the construction industry?**

1 to 5 years	☐	11 to 15 years	☐
6 to 10 years	☐	More than 16 years	☐

3. **How long have you been working in your current organisation?**

1 to 5 years	☐	11 to 15 years	☐
6 to10 years	☐	More than 16 years	☐

4. **What is the nature of your current organisation's business? (Tick One Only)**

Owner/Developer	☐	Contractor	☐
Construction/Project Management	☐	Other (please specify):	☐
Designer	☐	_____	

5. **What type of projects you are mostly involved in?(Tick as many as applicable)**

Residential	☐	Industrial	☐
Commercial	☐	Other (please specify):	☐
		_____	

6. **In what phase/s of the project lifecycle you are mostly involved in? (Tick as many as applicable)?**

Approval/Planning	☐	Post Construction	☐
Design	☐	Other (please specify):	☐
Construction	☐	_____	

7. **Have you been involved in the approval/planning phases of a project?**

Yes- Please Continue	☐
No- Please go to section 4	☐

SECTION 2- STAKEHOLDER INVOLVEMENT LEVEL

This research based on the available literature classifies the main phases of the planning process into 5 main categories namely: Establish the project, Identify customer, Develop the project, Develop the process and Control and operation. It also provides the details for each of these categories.

This section requires information about your current level of involvement in different activities of the planning process. For the activities you ranked below 3, please recommend your approaches that can improve your involvement

Based on the project you were involved in, please respond to:

- **PART A:** By ticking (√) the Please tick the appropriate box that best describes your level of involvement in the related activities
- **PART B**: For the activities you ranked below 3, please recommend your approaches that can improve your involvement

The Planning Process	**PART A** To what extent you have been involved in the following activities? Not involved/ Very low … Very high					**PART B** For the activities you ranked below 3, please recommend your approaches that can improve your involvement
	1	**2**	**3**	**4**	**5**	
Establish the Project						
Identify projects required to conform company's strategy and prepare mission statement						
Selecting project teams						
Identify the scope of the project						
Setting quality goals						
Define project resources and their limitations						
Identify Customer/Stakeholder						
Identify project customers/stakeholders						
Collect, analyse and prioritise customer's needs						
Design a program to address customer's needs						
Establish units of measurement for customer's needs						

	PART A To what extent you have been involved in the following activities?					**PART B** For the activities you ranked below 3, please recommend your approaches that can improve your involvement
	Not involved/ Very low				Very high	
	1	**2**	**3**	**4**	**5**	
Develop the Project						
Group together related stakeholders needs						
Determine methods for identifying project features						
Establish high-level and detailed project goals and features						
Optimise project goals and features						
Develop project schedule						
Identify acceptance criteria for project deliverables						
Identify quality standards and expectation for customers, project and governmental regulations						
Define method of data collection and archiving						
Establish quality assurance and control system						
Measure and monitor project performance						
Identify working/operation conditions which may affect project quality						
Establish information system						
Determine the local and governmental specifications and						
Identify the characteristic of project site						
Application of additional planning tools such as brainstorming, affinity diagram, nominal group techniques, etc.						
Develop the Process						
Review project goals						
Determine process features and goals						
Identify the process which leads to the final project						
Decide the most accurate methods to fulfil the processes						
Identify key factors that influence the effectiveness and efficiency of the processes						
Measure, monitor, analyse and optimise process features						
Establish process capability						
Assessment of potential errors which affect final project quality						

Control and Operation					
Identify controls needed and design feedback loop					
Establish audit system					
Determine criteria and methods for effective operation and control					
Develop a plan for transfer to operation					
Implement plan and validate transfer					

SECTION 3- QUALITY IMPROVEMENT LEVEL

Quality issues root causes are gathered and classified into four main categories namely Stakeholder/Managerial, Technical, Material/Equipment/Environment, and Cultural/Political issues. The aim of this section is to assess your opinion on the improvement level of these quality issues if you can more effectively get involved in the project in general and in the planning process in particular.
So, please specify to what extent your superior involvement can improve the following quality issues root causes.

Quality Issues Root Causes	To what extent your effective involvement can improve the listed quality issues?				
	Very low				Very high
	1	**2**	**3**	**4**	**5**
Stakeholder/Managerial					
Poor Management commitment					
Low effective project management system					
Poor relationship and partnering among project participants					
Poor supervision and monitoring system					
Lack of measurement and feedback system					
Supplier impact					
Lack of quality department and quality policy					
Lack of auditing system					
Absence of long term objectives					
Poor training system					
Uncoordinated needs and expectations					
Lack of process and continues improvement					
Delay in making important project decisions					
Inappropriate method of contractor selecting					
Lack of adequate knowledge, skills and information					
Technical					
Difficult application of quality systems					

Design complexity					
Difficult data collection system					
Poor performance of quality tools and techniques					
Low quality drawing and specification					
Technical Changes					
Material/Equipment/Environment					
Low quality and poor availability of resources					
Project size/scope					
Project complexity					
Low quality and Inadequate amount of material/equipments					
Nature uniqueness					
Climate and environmental issues					
Cultural/Political					
Low tendency to teamwork					
Aggressive competition during tendering					
Lack of motivation					
Conflict with government authorities					

SECTION 4- FURTHER COMMENTS

Please state any other points which you may think is related to your involvement in the project or improving quality issues that have not already been examined in this questionnaire

Thank you for your cooperation

Amirhossein Heravi
PhD Candidate
Faculty of Built Environment and Engineering, Queensland University of Technology
2 George St GPO Box 2434, Brisbane Qld
4001 Australia

Mobile: +61 411 255 411 **Email:** amirhossein.heravitorbati@qut.com.au

Appendix E

Case Study Protocol

CASE STUDY OBJECTIVES

The main aim of the case study is to identify the barriers and problems affecting efficient integration of stakeholders with the project as well as factors and determinants that lead to solution for more effective and efficient involvement of stakeholders in the project with aim to improve the final project quality.

INTERVIEW QUESTIONS

Current research case study questions are designed in order to answer main research project questions. A WBS technique was used to break the main questions into smaller ones. Then a review of the questions was implemented and as the result more detailed questions, written in lay language, are designed as below:

Beginning Question:

Q1: Have you been involved in the approval/planning phases of project lifecycle?

To evaluate stakeholder involvement in improving quality issues:

Q2: To what extent your involvement can address quality issues/problems?

Q3: What are the important quality issues that can be improved through your involvement and How?

To identify barriers and problems of stakeholder involvement:

Q4: What are the main difficulties you faced in involving in the project and particularly during the planning processes?

Q5: How do you overcome those difficulties?

To identify the factors for the enhanced involvement:

Q6: Do you suggest any approaches that can improve the effectiveness of stakeholder involvement in the project?

Q7: How those approaches for better involvement can be facilitated? In what phases of the PLC?

Q8: Do you have any specific approach to facilitate better involvement in the project planning processes?

Q9: How more effective involvement can improve quality issues?

Q10: What do you consider are the other benefits of this involvement?

CONFIDENTIALITY

The collected data for this research will be treated as strictly confidential. All comments and responses will be anonymous.

RECORDING AND STORING THE COLLECTED DATA

To ensure that all the comments and responses suggested by interviewee are collected, a digital audio recorder will be used to record the interview. All data will be stored in researcher's personal academic storage space within Queensland University of Technology area only.

INTERVIEW SESSIONS' TIMING

Phase 1 - Beginning Phase: Introduction to the research (5 mins)

- Introduce the researcher
- Ensure the interviewees of the confidentiality and provide ethics consent form for signature

'QUT has strict policy on ethics, and in order for this research to be carried, ethics had to be approved. That's why before we start the interview I would like to ensure you that this interview is absolutely confidential, and in no way it could be apparent that responses came from you. Could you please read and sign this consent form to confirm your agreement to participate.'

- Ask for permission to record the interview

Phase 2 - Implementing Phase: Case Study Questions (40 mins)

- Questions are available in the "interview question" section

Phase 3 - Closing Phase (2 mins)

- Since this research may conduct further interviewes for validating and verifying the final developed framework, the researcher check with interviewees if there is a chance to contact them again.

DATA COLLECTION PLAN AND PROCEDURE

I. **Selection of cases of research:** This research focuses on those building projects with more stakeholders and further need for improvement in quality. For this reason high and medium rise residnetial buildidng projects within Queensland State, preferably nearer to Brisbane city, are the main targets for selection of cases.

The 'participant information' form will be emailed to the participants prior to the interviews. The interviewees are requested to sign the 'consent' form before the interview can actually commence.

II. **Data collection method**: As mentioned before, the semi-structured interview is the selected method of data collection for case studies in this research. Although some pilot interviews were conducted in the previous stage of data collection (survey) to test the validity and reliability of desgined questions.

III. **Interview timeframe**: Case study interviews are planned to be conducted between September to December 2012.

IV. **Definition of terms used in interviews:** The interviewees are supposed to be selected from the people in the top and middle management level of those selected companies and are supposed to be familiar with many complicated terms; however the interview questions are designed in a way that there is no specific term that needs to be defined for the interviewees.

V. **Preparation and ethical clearance:** This research has received QUT ethical approval on the 15th Mach 2012 to start the data collection process.

Appendix F

Assembly of Descriptive Codes to Determine Matching Focused Codes and Forming the Elements of ESIF

This section provides an example of how the final categorisations and elements of the ESIF were drawn from the qualitative analysis. Complete list of elements and analysis approaches are included in the body of the thesis (Chapter6).