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Heravitorbati, Amirhossein, Coffey, Vaughan, Trigunaryah, Bambang, & Saghatfroush, Ehsan (2011) Examination of process to develop a framework for better implementation of quality practices in building projects. In *2nd International Conference on Construction and Project Management (ICCPM 2011)*, 16-18 September 2011, Grand Mercure Roxy Hotel, Singapore. (In Press)

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Examination of process to develop a framework for better implementation of quality practices in building projects.

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Abstract: Quality, as well as project success, in construction projects should be capable of being regarded as the fulfillment of expectation of those contributors and stakeholders involved in such projects. Although a significant amount of quality practices have been introduced within the industry, establishment and attainment of reasonable levels of quality internationally in construction projects continues to be an ongoing problem. To date, some investigation into the introduction and improvement of quality practices and stakeholder management in the construction industry has been accomplished independently, but so far no major studies have been completed that examine comprehensively how quality management practices that particularly concentrate on the stakeholders' perspective of quality can be used to contribute to final project quality outcomes. This paper aims to examine the process for development of a framework for better involvement of stakeholders in quality planning and practices and subsequently to contribute to higher quality outcomes within construction projects. Through extensive literature review it highlights various perceptions of quality, categorizes quality issues with particular focus on benefits and shortcomings and also examines stakeholders' viewpoint of project quality in order to promote the improvement of outcomes throughout a project's lifecycle. It proposes a set of arranged information as a basis for development of prospective framework which ultimately aims to improve project quality outcomes. The subsequent framework that will be developed from this research will provide project managers and owners with the required information and strategic direction to achieve their own and their stakeholders' targets for implementation of quality practices and achievement of high quality outcomes on their future projects.

Keywords: Project Quality, Continuous Improvement, Stakeholder Management, Construction Project Delivery

1. Introduction:

The concept of quality has played a significant role in the business management literature since the improvements in production and product quality for a global market began in Japan in the 1950s. During the last decade, many construction firms have been critically challenged to achieve higher and superior quality on their projects and in recent years more attention has been paid to implementing and improving quality management in the construction sector. However, due to the high cost of poor quality on many construction projects, additional research is still required to provide a framework for improvement of project quality outcomes (Hiyassat, 2000). Quality management philosophies have been recognized as successful drivers for management strategies in other industries (Farooqui & Ahmed, 2009a) but although the construction industry has seen increasing advancement of the use of science and technology within the sector, the adoption of quality management practices based on the stakeholder view of quality (Foster & Jonker, 2003) has made an impact at a much slower pace (Abdul-Aziz, 2002; Dahlgaard & Dahlgaard-Park, 2006; Mathews et al., 2000). Therefore, the development and establishment of more effective communication methodology between project participants and construction producers, in order to better align quality management actions in the construction industry both to meet the stakeholder view of quality as well as complying with specifications, is clearly one potential benefit that can result from further research and development at the present time. This paper is based on an extensive literature review undertaken for a PhD thesis and identifies common and serious quality problems/defects in construction projects and highlights the main causes, which most often result in quality failures. Categorization of these problems/issues forms the basis for a preliminary model for a future quality improvement framework specifically for use on building construction projects.

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2. Incorporation of Stakeholder Perspective in Project Quality:

Because quality management is such an important aspect in construction and building projects, in order to increase the ultimate project quality and to reduce rework, revision and waste and failure costs over the entire project lifecycle, the importance of greater involvement of all relevant project participants in quality management issues needs to be fully understood and embraced by project teams. Additionally, it should be noted that best-practice construction project management involves meeting or exceeding stakeholder requirements and expectations and thus project teams have to develop high-quality relationships with key project members, in particular with the main customers of the project, in order to understand the perception of quality more systematically (Tam & Le, 2007). Many studies have been undertaken regarding the capability of properly implemented quality management systems to improve the ultimate project quality (Arditi & Gunaydin, 1997; Elghamrawy & Shibayama, 2008; Hellard, 1994; Jr et al., 1991; Wong & Fung, 1999) and the question of the affirmative influences of stakeholder involvement upon project success has also been addressed by many other scholars (Cole, 2005; El-Gohary et al., 2006; Olander & Landin, 2005; Pajunen, 2006). However, the creation quality teams based on the incorporation of project participants into the planning of construction and building projects has not as yet been considered significantly (Walker, 2000). According to Heravitorbati (2011) if project key members are not satisfied with the quality of the project, the project team will have to adjust scope, time and cost to balance the non-meeting of stakeholders requirement and expectations on quality issues. For these reasons, it is imperative that greater focus is placed on the incorporation of stakeholder points of view with regard to establishing processes and practices designed to improve the quality of building projects.

3. Quality Problems in Building Projects:

Establishment and achievement of acceptable levels of quality in construction projects has long been a problem (Arditi & Gunaydin, 1997) but despite a significant amount of investigation already being undertaken to examine quality failures and their causes, construction projects are still encountering numerous quality problems. As stated by Xiao (2002), poor quality performance that results in increased rework and has significant impacts on cost and schedule is among the major defects experienced in construction projects. According to Pheng (1996) drawing and specification are not at satisfactory levels of quality and do not clearly always state the intention of the designer. According to Arditi (1998) these documents are the final result of design phase that leads to the physical construction of the project and therefore have an effect on the quality of the final project outcomes. Seaver (2001) affirms that successful companies need to meet their customer expectations through superior implementation of their quality policies, however currently many customers are still not satisfied with the quality of constructed projects. Construction materials sometimes do not meet specified standards and this also leads to subordinate quality on projects (Pheng & Wei, 1996). Serpell (1999) points out that the lack of qualified personnel is a major barrier in the compliant implementation of quality systems, whilst in the view of Jha and Lyer (2006), quality negligence produces many negative effects to construction companies achieving the desired levels of quality and additionally and low quality process implementation leads to the often ultimate poor quality of projects (Hiyassat, 2000). A 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 among the most serious problems of quality in construction project and these unsatisfactory issues continue to plague every sector of the industry and it's projects (Arditi & Gunaydin, 1997).

On the other hand, as noted by many scholars, one of the most significant issues which also results in serious quality defects in construction projects is the apparent lack of project members' involvement in quality decision-making and practices (Chan & Tam, 2000; Gransberg & Molenaar, 2004; Joaquin et al., 2010; Josephson & Hammarlund, 1999; Leonard, 2008; Marosszeky et al., 2002; Saraph et al., 1989; Serpell, 1999; Wong & Fung, 1999; Yang, 2010). Based on this evidence, it is fair to say that the quality of projects is affected by a vast number of issues and the appropriate realisation and implementation of measures to improve or eradicate them can aid to overcome a large amount of the factors and sources that lead to these quality problems. The next section provides a comprehensive explanation of the factors and sources of poor quality.

4. Quality Defects Sources and Causes:

A variety of authors have provided different categorizations of quality problems, but there have been few attempts to collect together and unify the major sources and factors that affect quality in a comprehensive manner. This paper utilises such classifications of quality problems in the extant literature and attempts to bring together a set of the most notable factors influencing quality and categorizing under four main headings as shown in Figure 1 below. This classified list provides a source of arranged information that can be used as a foundation for proposing an improved quality framework for implementation in building construction projects.

<i>Quality Problem Factors</i>		
- Lack of contractor supervision	(Arditi & Gunaydin, 1998; Wong & Fung, 1999)	Stakeholder Managerial
- Poor relationship and partnering among project participants	(Arditi & Gunaydin, 1998; Jha & Iyer, 2006; Tang et al., 2009)	
- Reduced Subcontractor responsibility	(Leonard, 2008; Pheng & Wei, 1996; Wong & Fung, 1999)	
- Inappropriate method of contractor selecting	(Arditi & Gunaydin, 1998; Pheng & Wei, 1996)	
- Poor quality procedure and department	(Chan & Tam, 2000; Moody, 2005; Saraph, et al., 1989)	
- Lack of auditing system	(Pheng & Wei, 1996; Samuels, 1994)	
- Poor Training system	(Arditi & Gunaydin, 1998)	
- Low quality continues improvement	(Joaquin et al., 2008; Pheng & Wei, 1996)	
- Lack of process improvement	(Pheng & Wei, 1996; Saraph, et al., 1989)	
- Lack of Management commitment	(Hiyassat, 2000; Marosszeky, et al., 2002; Yung & Yip, 2010)	
- Lack of quality policy	(Arditi & Gunaydin, 1997; Joaquin, et al., 2008)	
- Low effective project management system	(Anderson, 1992; Chan & Tam, 2000; Yung & Yip, 2010)	
- Bureaucracy	(Marosszeky, et al., 2002)	Technical
- Supplier impact	(Arditi & Gunaydin, 1997; Wong & Fung, 1999)	
- Low quality drawing and specification	(Arditi & Gunaydin, 1998; Pheng & Wei, 1996)	
- Design complexity	(Chan & Tam, 2000)	
- Difficult data collection system	(Arditi & Gunaydin, 1997)	
- Poor performance of quality tools	(Arditi & Gunaydin, 1997; Leonard, 2008)	Environment / Material/ Equipment
- Difficult application of quality system	(Mohammed & Abdullah, 2006; Serpell, 1999)	
- Nature uniqueness	(Chan & Tam, 2000; Kanji & Wong, 1998)	
- Project size and complexity	(Chan & Tam, 2000; Jha & Iyer, 2006)	
- Material/Equipment specification	(Hiyassat, 2000; Pheng & Wee, 2001)	
- Project Environment	(Chan & Tam, 2000)	Cultural/ Political
- Low quality and poor availability of resources	(Joaquin, et al., 2008; Yung & Yip, 2010)	
- Lack of motivation	(Marosszeky, et al., 2002; Pheng & Wee, 2001; Serpell, 1999)	
- Incompatible tendering procedures	(Jha & Iyer, 2006)	
- Low tendency to teamwork	(Marosszeky, et al., 2002)	

Fig 1: Sources of quality defects in building projects

As shown in Figure 1, quality failures originate from various sources such as technical, environmental/material and cultural/ political defects. However, poor stakeholder management appears to be one of the most fundamental causes of quality failures in many cases and the critical roles played by owners, management team, consultants, contractors, sub contractors, suppliers and final customers on project quality success has been supported by many researchers (Arditi & Gunaydin, 1997; Leonard, 2008; Tang, et al., 2009; Yung & Yip, 2010). Contribution of the key project participants in assisting to prepare quality management plans and shaping quality practices not only facilitates construction companies to solve those problems which are directly related to stakeholders, but is also a great help to overcome other problems which arise from other sources of defects. For instance, as stated by Pheng & Wei (1996), appropriate incorporation between stakeholders in the design and construction phase can result in higher quality of drawing and specifications. Arditi and Gunaydin (1998) also recognise management as being responsible for encouraging employees to work

as a team and advocate the significant influences of teamwork on final project quality. From such observations it can be concluded that stakeholder incorporation within quality management planning and proceeding will facilitate greatly in solving large numbers of quality problems in building projects.

5. Conclusions:

Good quality management and full stakeholder involvement are clearly regarded by many authors and researchers as two major success factors in construction projects. The research described in this paper has extracted and identified current quality defects, problems and issues which commonly arise during a typical project lifecycle and categorized them under four main headings, namely, stakeholder managerial, technical, cultural/political and environmental/ material/ equipment. Based on this set of classifications the next phase of this research will undertake a number of surveys and case studies from which to develop a framework for better and more focused implementation of quality practices on building projects, designed to encourage and utilize better stakeholder integration within critical quality management procedures.

6. References

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