INTERNATIONAL JOURNAL OF BUILT ENVIRONMENT AND SUSTAINABILITY
Published by Faculty of Built Environment, Universiti Teknologi Malaysia
Website: http://www.ijbes.utm.my
IJBES 4(2)/2017, 93-104

Critical Success Factors for Malaysian Construction Projects: An Investigative Review

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History:

Received: 26 January 2017
Accepted: 30 March 2017
Available Online: 30 May 2017

Keywords:

Critical success factor, Human-related factor, Malaysian construction industry, Project management

DOI:

10.11113/ijbes.v4.n2.180

ABSTRACT

Construction projects play an important role in the advancement of a nation through infrastructure development that leads to economic growth. They are planned carefully to accomplish certain goals. However, not all the projects achieved the goals as per planned. Many factors contribute to the successes and failures, and it becomes an interesting arena for research. The primary objective of this paper is to outline the development trend of project success measurement globally and locally. The research method employed was to make selected reviews on critical success factors' (CSFs) literature and to compare international standards and progress in incorporating human behavioural aspects of project management to the situation in Malaysia. A somewhat similar pattern can be observed in Malaysia where the studies have departed from the usual criteria of time, cost and quality, to define project success in a more holistic way. However, the domestic industry has failed to respond to the emerging trend globally as there has yet been any widely published research on the importance of human-related factors towards project success. A consolidated framework of CSFs has therefore, been proposed in responding to the findings. This paper fulfils an identified need as there has been a dearth of research on the subject matter locally.

1. Introduction

The Malaysian construction industry has contributed significantly to the country's economy, often accounting for 3% to 5% of the national Gross Domestic Product (GDP) value (Department of Statistics Malaysia, 2013). It is an important enabler of growth for other industries because of its extensive linkages with the rest of the economy, e.g. the manufacturing, logistic and financial industries. Nevertheless, the Malaysian construction industry is perceived to be under-achieving (CIDB Malaysia, 2006). It has often been characterised as fragmented resulting from inefficient and ineffective construction practices. Government institutions, practitioners and society at large have called for a change in attitudes, behaviour and procedures in order to address the challenges brought about by industry fragmentation.

The study of project success and critical success factors (CSFs) is therefore, timely as it is one of the vital ways to improve the effectiveness of project delivery (Chan, 2004). One of the reasons for the difficulties in managing projects especially in the government sector are due to the failure to determine the CSFs across project phases and failure to identify success elements in the form of efficiency and effectiveness measurement (Takim *et al.*, 2004).Various studies have been conducted over the years to explore factors that are considered really critical for achieving project success (Chan and Kumaraswamy, 1996; Cooke-Davies, 2002; Nicolini, 2002; Andersen *et al.*, 2006; Toor and Ogunlana, 2009; Meng, 2012) thus emphasising the importance of CSFs study towards construction project success.

However, the concept of CSFs or project success remained vaguely defined, as there is no general agreement achieved despite numerous attempts conducted by different researchers to determine the CSFs for construction projects. Most of these studies were context specific, their implementation and implication are usually limited to countries and the operating environment where these studies were conducted (Nguyen *et al.*, 2004; Toor and Ogunlana, 2009). There is a lack of effort to contextualise the findings into local contexts where the structure, culture and maturity of the concerned organisations are different.

Therefore, this study attempts to fill in the gap by re-assessing the CSFs for Malaysian construction projects in order to facilitate an up-to-date understanding of the current conditions of the local industry. A conceptual framework for the CSFs will be proposed through a critical review of literature on CSFs in general and Malaysia in particular. Discussion on the different features of the proposed framework will also be carried out to provide the justification of its inclusion in the framework. It is hoped that a strong foundation will be established through the framework, for further routing of the current research on the development of an effective relationship-based procurement model in Malaysia.

2. Methodology

The paper is based on the partial findings of a much broader study that employed a balanced philosophical stance in terms of its research methods and data collection techniques. Both 'positivist' and 'interpretivist' approach were adopted, which includes a thorough literature review, postal questionnaire survey sequentially followed by interviews and in-depth comparative analysis. By adopting an interpretative approach, the researcher could delve further into the questions of 'why' and 'how' the emerging CSFs from the questionnaire survey are able to improve project performance. It gives the researcher the opportunity to interact with the stakeholders and look into the heart of the industry's problem: the opportunism and adversarial attitude in the nature of the relationship among stakeholders in the industry. Positivist approach would not be able to answer them. In short, it was exploratory in nature and fuelled by a strong desire to improve the relationships among construction stakeholders in Malaysia.

As observation indicated that most of the studies conducted on local industry were either obsolete or unable to reflect the latest development in the industry (Lim and Mohamed, 1999; Takim and Adnan, 2008; Al-Tmeemy *et al.*, 2011), the current phase of the research was aimed at exploring the 'positivist' nature of the issues in question by determining 'what' really matters to the success of local construction project in order to satisfy the 'why' and 'how' in the later phase of the research. This emphasis thus by design only tangentially introduces the findings from the quantitative and qualitative inquiry.

This review provided the basis for the formulation of preliminary questionnaire and interviews. These findings are important as they depart from the traditional measures of time, cost and quality, to explore the rising importance of other CSFs associated with construction project success, particularly the human-related 'soft' factors.

The research method employed in this study was to make selected reviews of literature on CSFs over the past 22 years ranging from 1990 till 2012. The selection of literature was based on journal paper published at recognised construction related journals such as Construction Innovation: Information, Process, Management (CI), Construction Management and Economics (CME), Engineering, Construction and Architecture Management (ECAM), International Journal of Project Management (IJPM), Journal of Construction, Engineering and Management (JCEM) and Project Management Journal (PMJ).

3. Theoretical Background

3.1 Critical Success Factor

Rockart (1982) is the first person to coin the term - critical success factor (CSF). He defined CSFs as those relatively small numbers of truly important matters, which made the difference between success and failure. He opined that companies should focus their attention and resources (usually time) on these matters in order to achieve success. Sanvido *et al.* (1992), Tiong (1992) and Cooke-Davies (2002) adopted a similar view whereby they defined CSFs as those factors which are essential for the project stakeholders to achieve their project goals.

Rockart (1982) also highlighted that CSFs often relate to the specific characteristics or conditions of an industry. Therefore, it will certainly be different from one country to another depending on their respective operating environments, policies and legal frameworks. On top of that, CSFs will often evolve as the environment changes, the company's position within an industry changes or when a particular challenge or opportunity arises for that industry. Apart from that, it is also important to determine what CSFs are not. They are not a standard set of measurement or key indicators which can be applied across all industries. On the contrary, CSFs are specific areas with major importance to a particular industry, at a particular point of time. The identification of CSFs demand specific and diverse situational measures, many of which must be evaluated through soft, subjective information (Rockart and Bullen, 1981).

3.2 Defining CSFs for Construction Projects.

Project success is an abstract concept and to determine whether a project is successful is extremely complex and subjective (Parfitt and Sanvido, 1993; Chan, 2002). As such, two distinctions must be made clear at this stage in order to provide directions for further discussion. First and foremost, De Wit (1988), Atkinson (1999), Lim and Mohamed (1999), Cooke-Davies (2002), and Takim *et al.* (2004) have all differentiated project success from project management success. According to them, project success is usually measured against the overall commercial objectives of the project whereas project management success is measured against the traditional criteria of time, cost and quality.

Apart from that, there are also distinctions between success criteria and success factor. Success criteria refers to the measure by which success or failure of a project will be judged while success factor points to those inputs to the management system that may lead directly or indirectly to the success of the project (de Wit, 1988; Cooke-Davies, 2002). Success factors can be further classified under two main categories, one being hard, objective, tangible and measureable while the other soft, subjective, intangible, and less measurable (Andersen and Jessen, 2000; Chan, 2004; Andersen *et al.*, 2006).

As for the 'hard' factors, criteria such as time, cost and quality were widely adopted, however other factors such as health and safety, environmental sustainability, technical performance are also considered a sign of project success by various researchers (Belassi and Tukel, 1996; Hatush and Skitmore, 1997; Shenhar *et al.*, 1997; Atkinson, 1999). As for the 'soft' factors, attainment of goals such as satisfaction, effective communication, relationship between project participants, and absence of conflicts are factors with growing importance (Nicolini, 2002; Walker and Hampson, 2003; Chan, 2004; Dainty *et al.*, 2005; Andersen *et al.*, 2006; Toor and Ogunlana, 2009; Meng, 2012). Even though success criteria and success factor are different in nature, both of them are interrelated. Understanding of success criteria is essential towards the formation of CSFs for construction project.

Delineating these distinctions will enable the researcher to have a clearer direction on the subject matter and to avoid possible confusion. Various factors contributing to the success of project management were identified through an in-depth literature review. A careful study of these literatures reveals that CSFs can be grouped under different categories depending on the evaluation criteria that different researchers are looking at.

3.3 Changing Measure of Project Success on the Global Front

Over the last 20 years, various studies have been conducted on this topic suggesting an intense interest to understand the important elements that constitute project success. In the early 1990s, the successful implementation of a project was inherently tied to its

performance measures, which as stated previously were measured based on time, cost and project quality (Navarre and Schaan, 1990). Over the years, these criteria have become synonymous with project success. It has been discussed in almost every article on project success during the 1990s, such as in the works of de Wit (1988), Belassi and Tukel (1996), Hatush and Skitmore (1997), Shenhar *et al.* (1997) and Atkinson (1999).

Shenhar *et al.* (1997) proposed that apart from meeting schedule, budget and performance goals, project stakeholders must be able to bridge the gaps between project perceived performance, actual customer needs as well as business aspect of their company in measuring the real success of a construction project. They should not just concentrate on each individual project but must also have long-term benefits in mind. According to Shenhar *et al.* (1997), project success could be assessed along four distinct dimensions namely, project efficiency, impact on the customer, direct and business success, and preparation for the future. Those four dimensions are time-dependent. The first dimension evaluates on the project efficiency from the time of project execution until completion while the second dimension assesses on the impact of the project after a short time, when the project has been delivered to the customers. On the other hand, the third dimension can be assessed one or two year after the delivery when a significant level of sales has been achieved and the fourth dimension can only be assessed three to five years after project completion. Figure 1 depicts the four dimensions of project success.

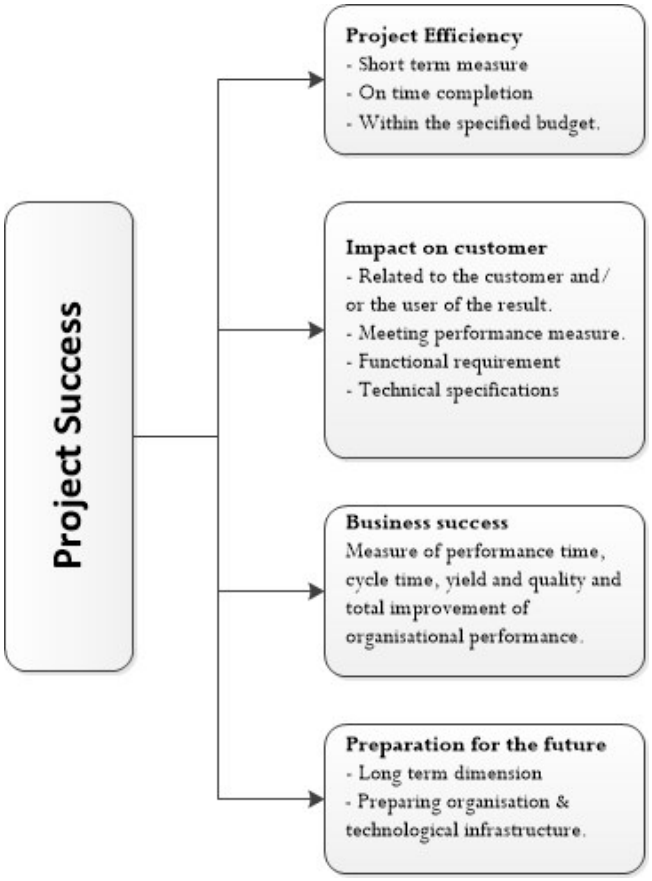

Figure 1: *The four dimensions of project success (Shenhar et al., 1997)*

On the other hand, Atkinson (1999) identified time, cost and quality as the "iron triangle" of project management. However, he opined that time and cost are at best, only presumptions, calculated at a time when least is known about the project. Apart from that, quality is subjective and based upon people's attitude and beliefs, which often change over the development life cycle of a project. Therefore, he suggested a new framework to consider other success criteria in addition to the "iron triangle" in order to obtain a more realistic view of project success.

Atkinson (1999) defined project success in two stages, which are the delivery stage and post-delivery stage. The delivery stage is concerned with the construction process and criteria needed to do it right while the post-delivery stage is concerned with getting the product function and the benefits for the stakeholders right. He suggested additional criteria such as maintainability of the construction products and stakeholder's satisfaction to be added in to address to the needs of various construction processes as stated in Figure 2.

In short, his intention was to shift the focus of measurement from the exclusive process-driven criteria which are time, cost and quality to include a more comprehensive list of criteria needed in various construction stages. This includes the post-delivery stage where user satisfaction and impact of the project are vital. Atkinson (1999) hoped to reduce the shortcomings he perceived of the "iron triangle" and connect the missing link in understanding project management success thoroughly.

Chan (2004), Belassi and Tukel (1996) both suggested that CSF can be grouped under a few different categories which include (i) project-related factors; (ii) project management factors; (iii) human related factors; and (iv) external factors. Figure 3 shows the relationship between all the factors and project success. Variables within each group are interrelated and intra-related. A variable in one group can influence a variable in others, and *vice versa*.

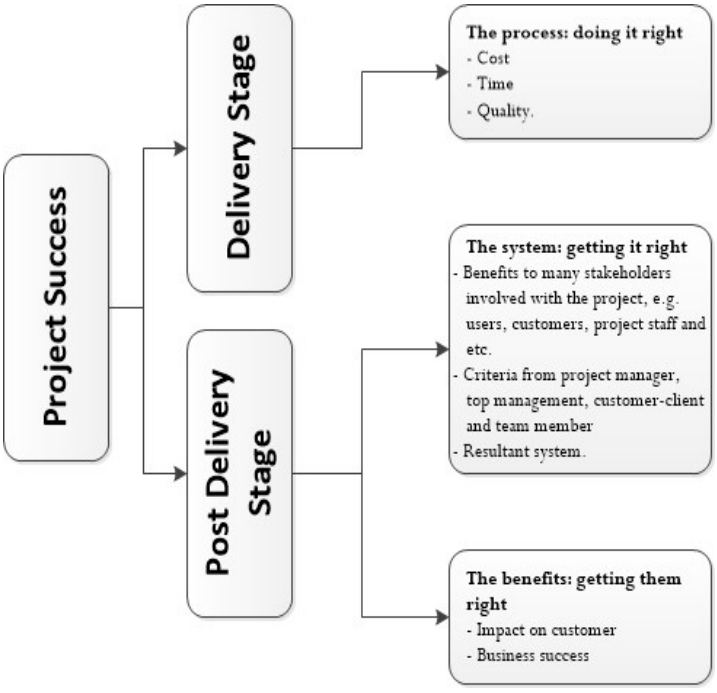

Figure 2: *Atkinson's model of measuring project success (Atkinson, 1999)*

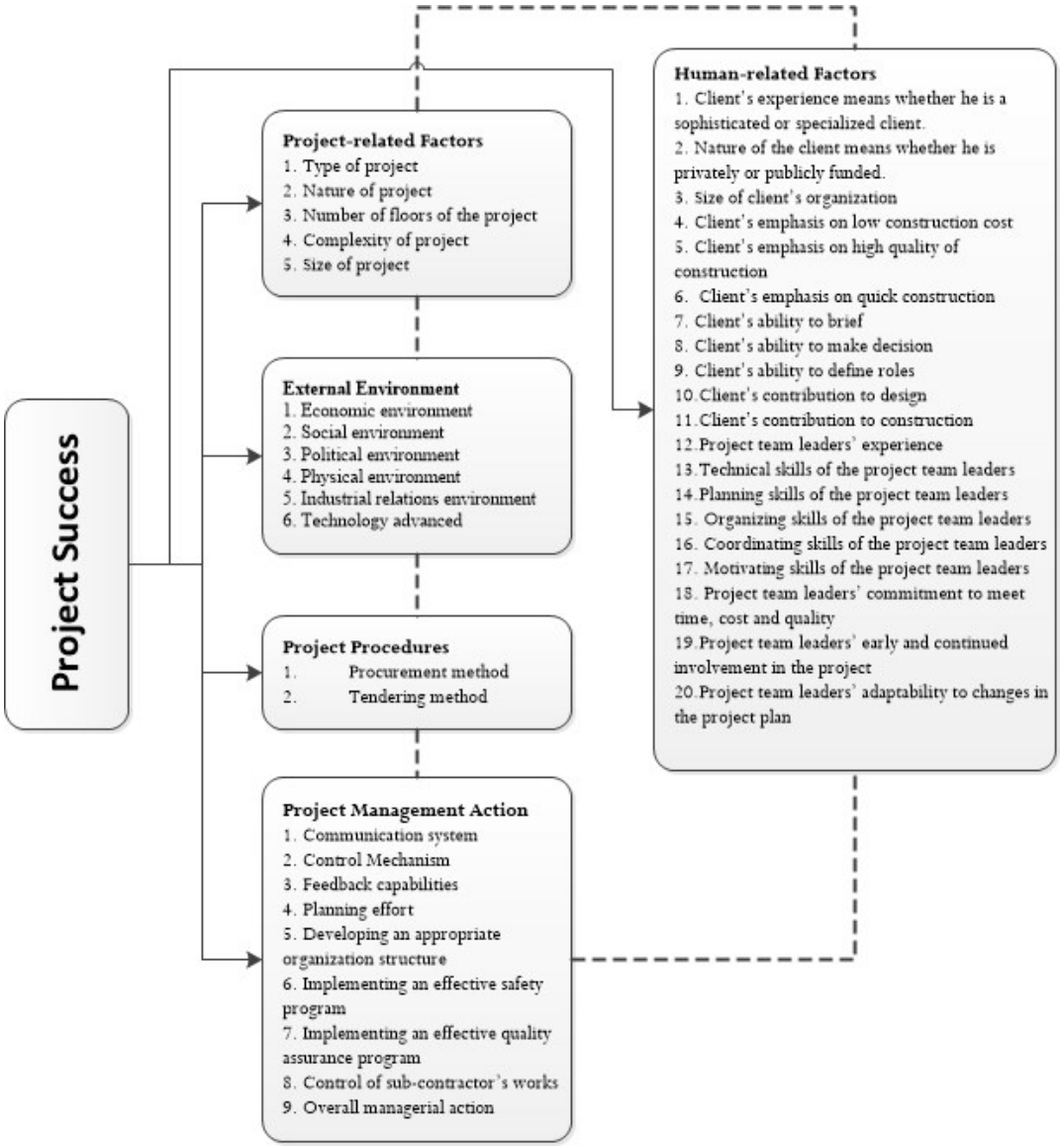

***Figure 3**: Conceptual Framework for Factors Affecting Project Success (Chan, 2004)*

Project-related factors include attributes such as type of project, nature of projects, and complexity of projects while project management usually involved the project managers and management tools used to plan and execute construction projects. Hence it includes adequate communication, coordination, monitoring, control mechanism, feedback capabilities and so on. In addition to that, the human-related attributes are further divided into two categories: one is related to clients, another is the project team. It includes commitment, working relationship, technical and professional skills and so on. In addition to that, external factors are related to all external influences on the construction process, including social, political and technical systems (the over-arching environment). The attributes include economic environment, social environment, physical environment and level of technology advanced. Chan (2004) further include an additional factor in his conceptual model which is the procurement factor. The procurement method as well as the tendering procedure will also play a part in determining the success of a particular construction project.

3.4 Emerging trend on the importance of human-related factors

The analysis on the literature also revealed that there is an emerging trend in recognising the importance of human factors such as trust, cooperation and commitment to the success of a construction project, apart from the traditional measures of time, cost and quality (Nicolini, 2002; Walker and Hampson, 2003; Chan, 2004; Dainty *et al.*, 2005; Andersen *et al.*, 2006; Toor and Ogunlana, 2009). Fellows (2010) elaborated that in order to bring forth a paradigm shift to the construction industry, it will not be sufficient by merely adopting the usual findings, principles and tools adapted from any literatures available on construction management. In fact, it is the human factors – the soft issues that are vital to the transformation of the industry alongside with thorough cultural assimilation and support from top management (Andersen *et al.*, 2006; Fellows, 2010).

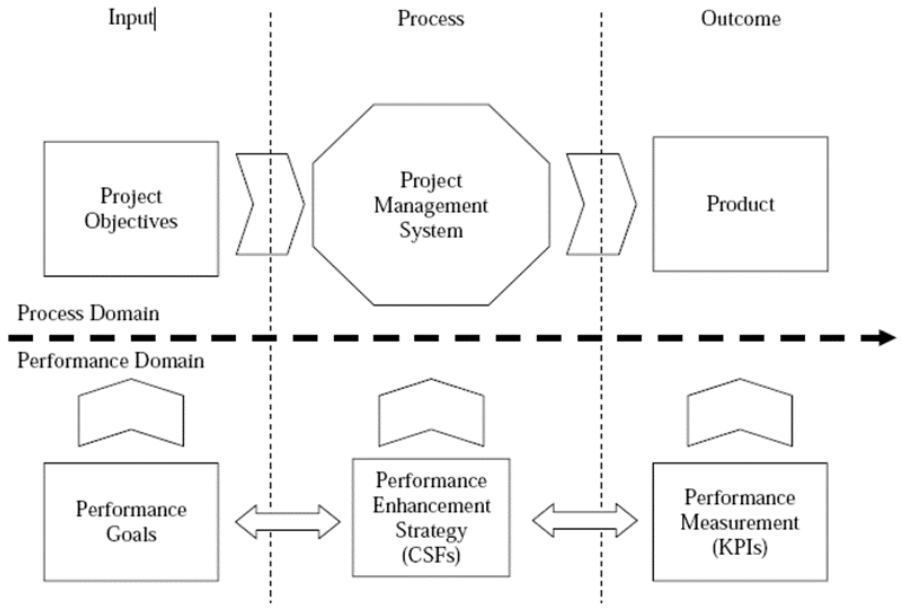

***Figure 4**: Input, process, and outcome of project management (Toor and Ogunlana, 2009)*

On a cross-cultural study on project success, Andersen *et al.* (2006) recognised that project success depends not only on the hard features but also on the "softer" features of project management. Analysis of the data collected from four culturally different regions (UK, France, Norway and China) implied that regardless of cultural differences, the most important factors in improving the ability to deliver projects on time and at cost consist of a combination of hard features such as strong project commitment through stakeholders' involvement in the early stage of the project and "softer" skills such as rich communication and greater quality of information sharing, factors which are less based on engineering techniques. Andersen *et al.* (2006) further emphasised that rich project communication plays a key role in trust building among project stakeholders which contribute to effective and sustainable working relationship in the long run. Hence, the "softer" skills do not only contribute to the success of a particular project, but also to the long term health of the industry.

On another hand, Toor and Ogunlana (2009) opined that project management can be divided into three general phases namely input, process and outcome within two major domains - process and performance. Figure 4 shows that although the process and performance domains are different in attributes, they remain interrelated to one another as part of the project management. During the process phase, performance domain involves the formation of performance enhancement strategy in the form of CSFs. These performance enhancement strategies are vital to the success of construction project. In their earlier work, Toor and Ogunlana (2008) identified four performance enhancement strategies for project success. These strategies were identical to the human-related factors discussed in other literatures. They were called the critical "COMs" of project success - comprehension, competence, commitment, and communication respectively.

Comprehension means that the project goals and priorities, requirements of client, and interests of all stakeholders are well understood and recognised in the project plans. Clients are expected to take the initiative to provide clear requirement at the beginning of the project and accept the advice and solution proposed by the consultants. In addition to that, a competent team with knowledgeable, experienced and proficient individuals is also essential to the performance of a project. On another note, commitment refers to dedication and interest of all related parties in the project; especially, the support from top management. Last but not least, communication refers to the client responsiveness to the needs of the concerned parties as well as clear communication of mutual needs, issue, problems and suggestions among the stakeholders.

3.5 Changing Measure of Project Success on the Local Front

Although measurement of project success has previously been explored extensively out of Malaysia there has been a lack of effort to understand the underlying challenges within the local industry and to contextualise these findings into appropriate strategies that suit to the operating environment of local organisations. While several studies have been conducted within the prior orthodox parameters of CSFs (time, cost, quality) in Malaysia, research into the newer specific variables with growing importance in the literature, namely the human-related factors such as trust, commitment and relationship between stakeholders, has not received much attention. The relative paucity of such research in Malaysia also has ignored the empirical work done by Lim and Mohamed (1999) that project success should be viewed from different perspective such as the individual owner, developer, contractor, user, and the general public. Two categories: the macro and micro viewpoints of project success were proposed in their study.

The macro viewpoint of project success attempts to look into the overall picture of the project and determines if the original project concept is satisfied. Drawing from the perspective of the individual owner, end-user as well as general public, it is mainly concerned with the prestige and the user satisfaction of the project. This approach may be referred to as the conceptual and operational phases of the project. On the other hand, the micro viewpoint of project success deals with project achievement in smaller component levels such as fulfilment of technical requirements and completion within time, budget and quality. It is usually referred to as the construction phase of the project and therefore based on the perspectives of the developer, contractor and

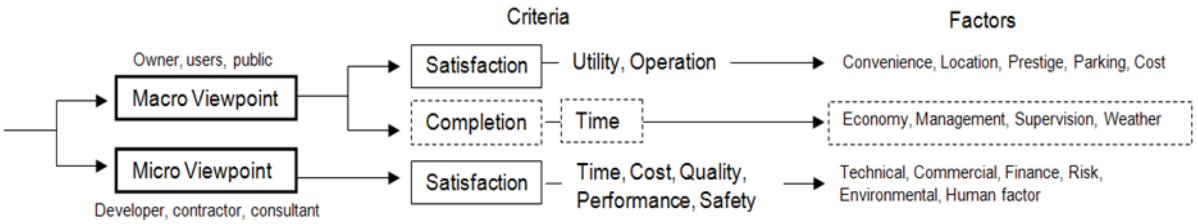

Figure 5: *The relationships between micro and macro viewpoint of project success. (Lim and Mohamed, 1999)*

consultant. Figure 5 gives a clearer picture explaining the relationships between micro and macro viewpoints of project success.

Takim *et al.* (2004) opined that a general concern has been shown for the difficulties of managing projects in the government sector. The possible reasons are due to inappropriate business methodologies adopted, failure to determine the CSFs across project phases, failure to identify the element of success in the form of efficiency and effectiveness measures, and failure to adopt systematic performance measurement systems conclusively for benchmarking projects. They suggest that project success can be measured in the form of efficiency and effectiveness factors. The findings reveal that efficiency measures are related to the "process" involved in the development of construction projects. They are represented by four principal factors namely: Quality and conflict resolution, process improvement programme, resource management and project objectives. In the meantime, the effectiveness measures are related to the project "results".

Adopting a different perspective, Al-Tmeemy, Abdul-Rahman, and Harun (2011) looked at project success in Malaysia in a multi-dimensional way that goes beyond the usual criteria of time, cost and quality. They suggest that success criteria should incorporates short and long term goals of the companies. The project is considered successful when it is capable of satisfying the three success dimensions as stated in figure 6. The first one is project management success, which is concerned with attaining project goals such as completion within the contractual period, and within the allocated budget as well as conforming to the standards as per project requirement. The second dimension is product success, it relates to the functionality, fulfilment of technical requirement as well as customer satisfaction towards the project. Last but not least, the third dimension is market success which relates to project's potential in contributing to the company's long term benefits in terms of gaining a competitive advantage; enhancement of company reputation; increasing market share; and attaining specific revenue and profits.

3.6 Relationship of Project CSF to Procurement System

A timely understanding on project CSFs will help to bring forth transformational changes to the way project is procured locally. For example, human-related CSFs such as trust, commitment, and effective communication will help to bring about a fundamental change in the traditional procurement procedure from detached relationship to

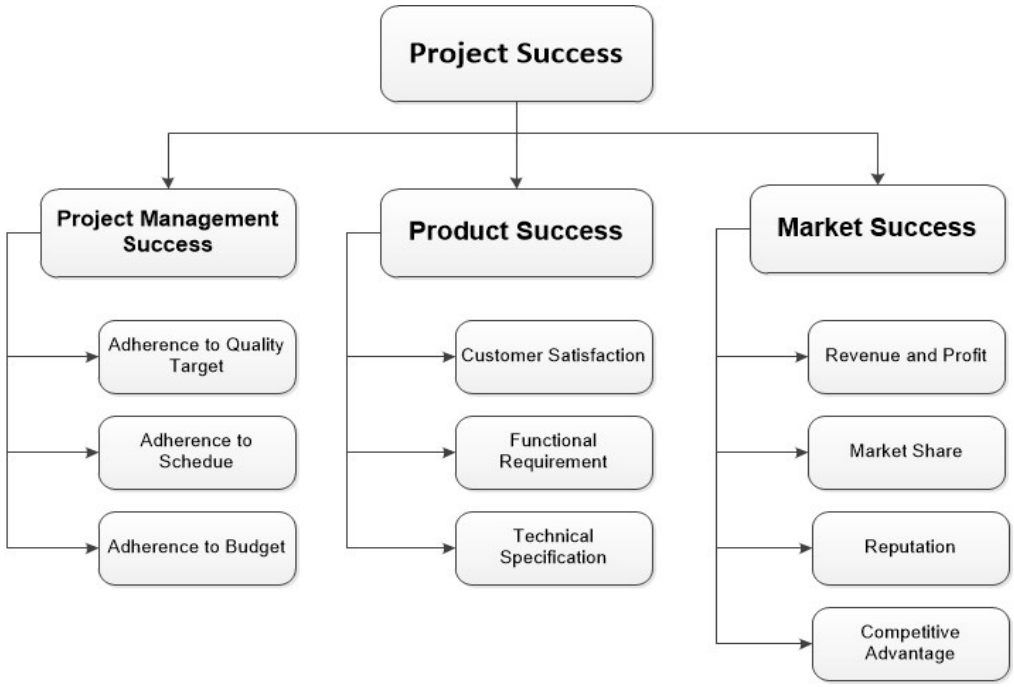

Figure 6: *Success Criteria for Building Projects (Al-Tmeemy et al., 2011)*

mutual working environment.

The traditional procurement method employed fixed price competitive tendering whereby the client first identifies the project specification as detailed as possible, followed by evaluations on the tendering bids and normally awarding the project to the lowest fixed bid price (Korczynski, 1996; Kadefors, 2004). The division of work in traditional procurement procedure often leads to detached business relationships as the construction process is traditionally managed by work being divided into distinct packages that are allocated to different stakeholders to be completed individually (Barlow, 1997; Masterman, 2002). These procedures of work division may lead to what has been termed '*functional fragmentation*' across different construction disciplines.

For small scale projects involving low uncertainty, such procurement procedure is suitable for cost effectiveness and risk mitigation (Korczynski, 1996; Eriksson, 2006). However, the construction industry has since evolved from a simple and static environment to a more complex and dynamic one (Gidado, 1996), thus rendering traditional procurement procedures obsolete and inappropriate (Naoum, 2003). Due to the increased complexity, project participants would now need to deal with a more complicated web of relationships as more stakeholders from various disciplines are involved in the decision making process. As such, a stronger focus on cooperation is more important than competition (Korczynski, 1996). These project characteristics often require relation-specific management, a greater level of knowledge sharing and more flexibility, which are all facilitated in a long-term cooperative relationship (Pietroforte, 1997; Kumaraswamy *et al.*, 2002; Eriksson, 2006).

Axelrod (1984) and Cheung *et al.* (2003) both asserted that traditional procurement procedures are the potential root cause for the lack of trust and opportunism that characterises many client-contractor relationships since it offer little incentive for cooperation to emerge. According to the Malaysian Construction Industry Master Plan (2004), it is common for the local construction firms to price their work unrealistically low and sought to recoup their profit margin later through contract cost variation from design changes and other claims. Such a situation usually leads to disputes and arbitration if not litigation.

Hence, a relationship-based approach towards procurement that strives to enhance greater commitment, trust, and communication between project stakeholders is argued to be one of the most suitable remedies for many of the industry's problems that originate from an adversarial relationship.

4. Discussions and Findings

4.1 Consolidated Framework of CSFs for Construction Project.

Reviews on the relevant literatures disclosed that different success criteria were hypothesised by different researchers based on various parameters. Understanding of these criteria and parameters are vital for the formulations of project CSFs. Following the literature review, a consolidated framework of CSFs for construction project in Malaysia was developed.

The proposed framework incorporated the same analogy employed by Chan (2004) in the development of a conceptual framework affecting project success. The latter model comprises five different groupings with respective success factors. Chan's (2004) model was selected, as the components were able to reflect the objective of this research, in establishing contingent relationship of the project CSFs to the procurement process. Outcome based CSFs or product success as mentioned in other studies was not within the scope of this study and therefore not included in the proposed model.

Nevertheless, the distinction between the proposed model and Chan's (2004) model was on the project implementation stage. Greater emphasis has been given to project management and planning as well as project stakeholders' categories in the proposed model, in view of the increasing importance of human-related "soft" factors. In addition to that, the project implementation stage is also the most effective period to adopt strategic measure to deal with project success (Li et al, 2005). Though all features mentioned in the proposed framework have their own impact on project success, both project management and planning as well as project stakeholders' categories have more vital influences and profound implications on the performance outcome of a project.

The exhaustive lists of factors selected from various studies were thus condensed into five explainable groupings as in figure 7. In order to refine the items in the framework, a pilot test (Yong and Mustaffa, 2012) was carried out where 14 individuals were approached to complete and comment about the framework. This resulted in few modifications on the initial list of CSFs. Some items were deleted due to their repetition in other form and inappropriateness while others were combined for better understanding of the participants. Apart from that, additional items were included based on recommendations received. As a result, a list of 46 CSFs in 5 categories was finalised. It is presented in Table 1 in a tabular format indicating that these CSFs have been widely mentioned in the previous work thus carrying a robust literature backing. These CSFs have also been validated in the subsequent quantitative inquiry (Yong and Mustaffa, 2013).

The proposed framework illustrates how each category is interrelated to one another, although they are different in nature. A factor in one category can influence a factor in another one, and a combination of several factors from different categories might lead to project failure. The grouping of the factors also made it easier to identify whether the project success or failure is attributed to the project nature, stakeholders, or the project management and planning.

4.2 Project Management and Planning

Construction projects often require detailed and thorough planning before the actual implementation of the works. Setting a well-defined scope of work and clear identification of expectation, challenges and project constraint at the early stage of the project will provide a clear direction to the design team (Toor and Ogunlana, 2009). The involvement of all the stakeholders in the early stage of the project planning will help to identify any ambiguities in the project and improve communication among the team members. In fact, a global consensus has emerged on client practices to focus on the adoption of policies that will engender collaboration among all parties and will generate mutual commitment to the success of project. Key to creation of such environment and a radical break from traditional practice is the early appointment of the project team that includes all principal parties (Andersen *et al.*, 2006; Kong and Jason, 2006; Sambasivan and Yau, 2007; Toor and Ogunlana, 2009). In Malaysia, this research indicated that global tendency is not yet widely followed. In fact, the traditional design-bid-build method is still considered the most prevalent choice of procurement procedure among construction stakeholders in Malaysia (Yong and Mustaffa, 2013).

On the other hand, various studies have pointed to the importance of effective control and monitoring during the construction stage towards project success (Chan and Kumaraswamy, 1996; Lim and Mohamed,

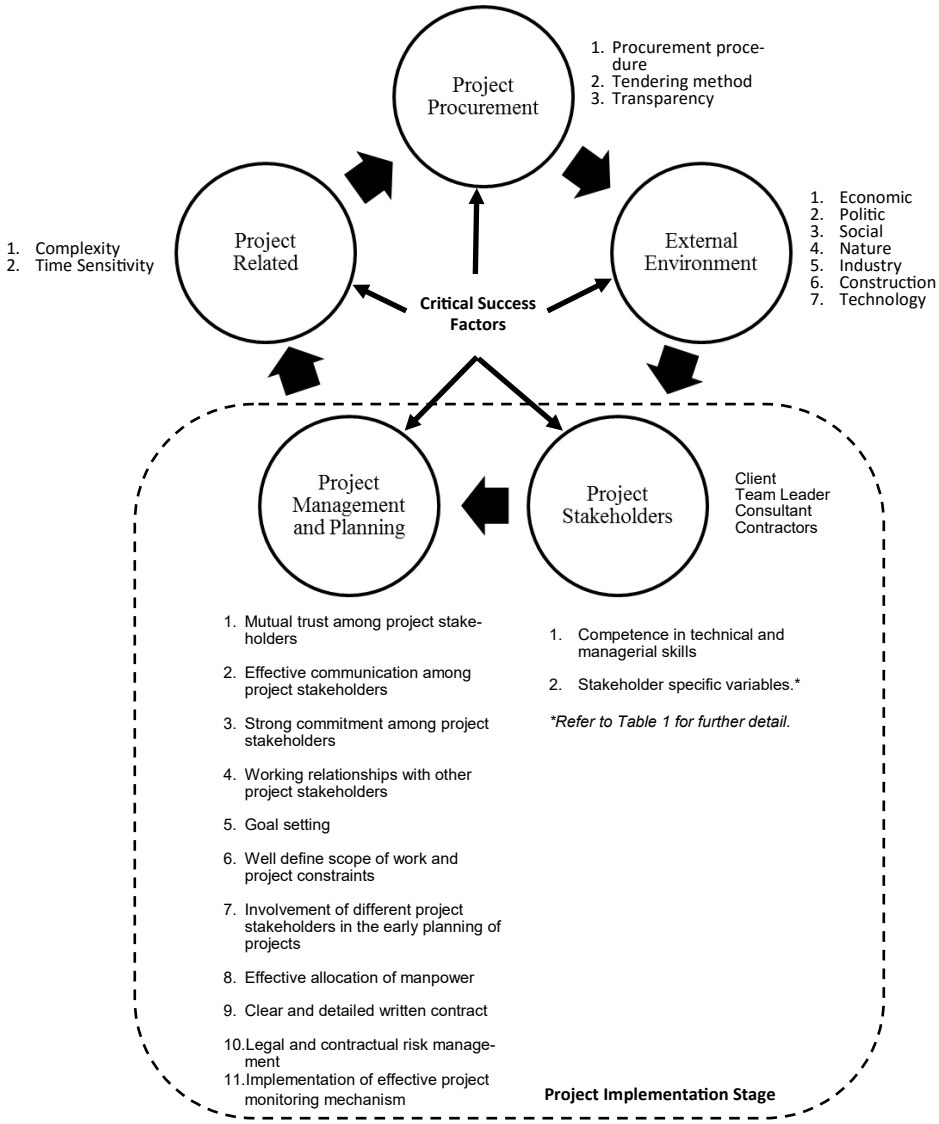

Figure 7: *Consolidated Framework of Critical Success Factors for Construction Project in Malaysia.*

1999; Alaghbari *et al.*, 2007). It includes several aspects such as effective project monitoring mechanism, supervision of contractor's work, and effective allocation of manpower. The supervision of site work is vital to ensure the required qualities are being achieved at construction site (Akintoye, 2000). Sambasivan and Soon (2007) identified that the local (Malaysian) contractor often faces deficiency in site planning and project implementation, resulting in construction mistakes that affect the profitability of the project. Inadequate contractor experience could further be traced down to the shortcoming inherent in the contact awarding procedures in Malaysia where most of the construction projects were awarded to the lowest bidder (CIDB Malaysia, 2006). This research confirmed both of these conclusions from earlier studies. Results from the quantitative inquiry also indicated that site management and supervision is ranked among the top five critical success factors for construction projects in Malaysia (Yong and Mustaffa, 2013).

However, it is also important to note that the problem of site management and supervision should not be exclusive to the client and contractor alone. Lack of experienced site staff such as the clerk-of-works, resident architects and engineers on the consultant side also causes co-ordination problems and deficiencies in project performance. On top of that, the construction industry in Malaysia is also swamped with foreign workers from Indonesia and Vietnam (Department of Statistics Malaysia, 2011). Most of these foreign labours in Malaysia are not skilled workers and their work quality is relatively low compared to the locals (Narayanan and Lai, 2005). The low quality and productivity have a substantial effect on project quality. They should be monitored closely with an effective control mechanism and been given training from time to time to improve productivity. See Table 1 where respondents identified these issues as problematical for Malaysia.

4.3 Project stakeholders

Project stakeholders' competence is another important finding that emerged from the literature review. In fact, it is also one of the main themes that has consistently emerged from both pilot study and quantitative survey (Yong and Mustaffa, 2012; 2013). Higher stakeholders' competency will eventually result in greater project quality and detailed risks assessment thus increasing the likelihood of project success (Agarwal, 1994). Belassi and Tukel (1996) opined that project team members played an important role from the inception stage until the completion of a construction project. Their commitment

Table 1: *List of critical success factors developed from the literature.*

No.	Description of critical success factor	Relevant literature
	Project Related Factors	Walker (1995), Songer and Molenaar (1997), Chua et al. (1999) Dissanayaka and Kumaraswamy (1999), Kumaraswamy and Chan (1999)
1	*Complexity of the project*	
2	*Urgency in meeting project deadline*	
	Project Planning and Management Factors	
3	Mutual trust among project stakeholders	Mayer et al. (1995), Munns (1995), Hartman (2002), Cheung et al. (2003), Walker and Hampson (2003), Kadefors (2004), Nguyen et al. (2004) and Pinto et al. (2009)
4	Effective communication among project stakeholders	Pinto and Slevin (1988), Chua et al. (1999), Cooke-Davies (2002), Nicolini (2002), Walker and Hampson (2003), Nguyen et al. (2004), Andersen et al. (2006), Fortune and White (2006) and Sambasivan and Yau (2007)
5	Strong commitment among project stakeholders.	Belassi and Tukel (1996), Walker and Hampson (2003), Andersen et al. (2006) and Toor and Ogunlana (2008)
6	Working relationships with other project stakeholders	Sanvido et al. (1992), Nicolini (2002), Nguyen et al. (2004) and Meng (2012)
7	Goal setting	Pinto and Slevin (1988), Songer and Molenaar (1997), Lim and Mohamed (1999), Nicolini (2002), Nguyen et al. (2004), Fortune and White (2006) and Toor and Ogunlana (2009)
8	Well define scope of work and project constraints	Chua et al. (1999), Nicolini (2002) and Andersen et al. (2006)
9	Involvement of different project stakeholders in the early planning of projects	Andersen et al. (2006), Kong and Jason (2006), Sambasivan and Yau (2007) and Toor and Ogunlana (2009)
10	Effective allocation of manpower	Chua et al. (1999)
11	Clear and detailed written contract	Sanvido et al. (1992), Chua et al. (1999) and Nguyen et al. (2004)
12	Legal and contractual risk management	Chua et al. (1999), Walker and Hampson (2003), Takim et al. (2004) and Toor and Ogunlana (2009)
13	Implementation of effective project monitoring mechanism	Belassi and Tukel (1996), Nicolini (2002), Cooke-Davies (2002), Nguyen et al. (2004), Fortune and White (2006) and Toor and Ogunlana (2009)
	Project Stakeholders Factors - Client	
14	Project Financing (cash flow)	Lim (2005), Sambasivan and Yau (2007)
15	Client's confidence in construction team	Walker (1995)
16	Client's experience of construction project organization and management	Sanvido et al. (1992), Chan and Kumaraswamy (1996), Songer and Molenaar (1997), Dissanayaka and Kumaraswamy (1999)
17	Client's responsiveness to the needs of the other stakeholders	Songer and Molenaar (1997), Fortune and White (2006), Low and Chuan (2006) and Toor and Ogunlana (2009)
18	Demand and variation	Kong and Jason (2006)
19	Top management support from client organisation	Pinto and Slevin (1988), Belassi and Tukel (1996), Chua et al. (1999), Nicolini (2002), Nguyen et al. (2004), Dainty et al. (2005) Andersen et al. (2006), Fortune and White (2006) and Toor and Ogunlana (2009)
20	Awarding bids to the right designers /contractors	Songer and Molenaar (1997), Nguyen et al. (2004), and Toor and Ogunlana (2009)
	Project Stakeholders Factors - Project Team Leader (Architect/PM	
22	Competence (Technical and managerial skills)	Pinto and Slevin (1988), Sanvido et al. (1992), Belassi and Tukel (1996), Munns and Bjeirmi (1996), Chua et al. (1999), Nicolini (2002), Nguyen et al. (2004), Fortune and White (2006) and Toor and Ogunlana (2008)
23	Adaptability to amendment in project plan.	Munns (1995), Walker and Hampson (2003) and Toor and Ogunlana (2009)
24	Leadership and authority	Nicolini (2002), Walker and Hampson (2003), Toor and Ogunlana (2006) and Toor and Ofori (2008)
25	Early and continuous involvement in the project development.	Walker and Hampson (2003) and Toor and Ogunlana (2009)
	Project Stakeholders Factors - Project Consultant	
26	Competence (Technical and managerial skills)	Pinto and Slevin (1988), Sanvido et al. (1992), Chua et al. (1999), Belassi and Tukel (1996), Nicolini (2002), Nguyen et al. (2004), Belout and Gauvreau (2004), Fortune and White (2006) and Toor and Ogunlana (2009)
27	Providing adequate design details & specifications	Sanvido et al. (1992)
28	Cooperation in solving problems among project stakeholders	Cheung et al. (2003), Walker and Hampson (2003)
29	Involvement to monitor project progress	Belassi and Tukel (1996), Chan and Kumaraswamy (1996), Lim and Mohamed (1999), Akintoye (2000), Alaghbari et al. (2007) and Sambasivan and Yau (2007)
	Project Stakeholders Factors - Consultants	
30	Contractor's competence and experience	Sanvido et al. (1992), Belassi and Tukel (1996), Chua et al. (1999), Sambasivan and Yau (2007) and Toor and Ogunlana (2009)
31	Implementing an effective safety program such as SHASSIC	CIDB Malaysia (2006)
32	Implementing an effective quality assurance program such as QLASSIC	CIDB Malaysia (2006)
33	Supervision of subcontractors works.	Sambasivan and Yau (2007)
34	Skilful workers	Narayanan and Lai (2005), Sambasivan and Yau (2007)
35	Emphasis on high quality workmanship instead of low and quick construction	Takim et al. (2004)
36	Effective project budget monitoring	Alaghbari et al., (2007) and Sambasivan and Soon (2007)
37	Site management and supervision	Belassi and Tukel (1996), Chan and Kumaraswamy (1996), Lim and Mohamed (1999), Akintoye (2000), Alaghbari et al. (2007) and Sambasivan and Yau (2007)
	Project Procurement	
38	Competitive procurement	Walker (1997), Kumaraswamy and Chan (1999), Walker and Hampson (2003) and Eriksson (2006)
39	Transparency in the procurement process	Walker and Hampson (2003) and Eriksson (2006)
40	Tendering method	Dissanayaka and Kumaraswamy (1999), Walker and Hampson (2003) and Eriksson (2006)
	External Environment	Belassi and Tukel (1996), Songer and Molenaar (1997); Chua et al. (1999), Takim et al. (2004), Sambasivan and Yau (2007)
41-46	*Economic (stable economy and sound economic policy); Social (Social (public acceptance towards the project); Political; Nature (weather conditions); Industry Related; Issues (availability of resources); Construction Technology (IBS, IT and online platform, new construction method etc.)*	

and competence are the critical factors affecting project planning, scheduling and communication. Such view is consistent with the work of Toor and Ogunlana (2009) whereby a construction team with knowledgeable, experienced and proficient individuals is fundamental to project success.

Apart from that, Alaghbari *et al.*, (2007) and Sambasivan and Soon (2007) both stressed that clients need to ensure strong financial capability to maintain the cash flow of the project. Financial problems such as delayed payments and financial constraints are seen to be a major factor that causes delay in the construction project. In fact, there are many under-capitalized developers in Malaysia taking on speculative development and most of these projects may eventually run into cash flow problems as a result of bad financial planning (Lim, 2005). As

construction often involves huge amounts of money, most of the contractors find it difficult to bear the heavy expenses once their payments are delayed. The clients have to be a credible paymaster to pay the contractor promptly in order to ensure a timely completion of the project works.

Apart from technical and managerial skills, studies have also shown that leadership quality of the project stakeholders particularly the project manager can have a great impact on the project outcome (Munns, 1995; Walker and Hampson, 2003; Toor and Ogunlana, 2009). As construction project is temporal in nature, it may be difficult to develop trusting relationships among stakeholders during the early stage of construction. Therefore, the ability of the project manager to create the appropriate initial atmosphere for the project is of utmost importance. He must be sensitive to the intentions as well as expectations of his team members and must have the ability to pull the team together in varied situations. On top of that, competency is also vital in building credibility among stakeholders; it is in fact one of the main ingredients in engendering an atmosphere of trust among different players in the industry (Mayer *et al.*, 1995; Kadefors, 2004; Pinto *et al.*, 2009).

5. Conclusions

In developed countries, particularly the United Kingdom and Hong Kong, a large part of the literature concerned with project success has tend to shift from the usual time, cost and quality to a more comprehensive list of criteria needed in various construction stages. These include criteria such as safety, user satisfaction and long term business impact. This is perhaps in response to the increased awareness of the end users and the more challenging nature of the operating environment amidst fierce global competition.

In addition to that, there is also an emerging trend in the literature to research the impact of trust, commitment and communication among project stakeholders towards project success. Many studies suggested that those factors are now essential to the success of not only individual project but the entire construction industry which is often characterised by adversarial relationship and opportunistic behaviours among stakeholders.

In this context a limited number of studies have been conducted to look into the possible ways of improving project performance in Malaysia. A similar pattern can be observed from these studies where they have departed from the usual time, cost and quality and attempted to define project success in a more holistic way that involves different stages of construction. However, there has not yet been any widely published research that has described construction stakeholders' attitudes and behaviours in relation to project success in Malaysia. Most of them have failed to look into the heart of the industry's problem – opportunism in the nature of the relationship among stakeholders. Even though various dimensions of project success have been discussed, researchers remained relatively silent on matters relating to human factors.

With rapid changes happening in the construction industry, the previous findings have become obsolete and unable to reflect the current development in the industry especially with the growing needs for a relationship-based approach in procurement. Since the industry has limited trust and is plagued with adversarial relationships, the study of human-related factors is timely and vital to the success of Malaysian construction industry.

A consolidated framework of CSFs has therefore been proposed based on the understanding of the success criteria being examined. Further empirical testing of the framework will be carried out to refine factors that are really critical within the local Malaysian context and business operating environment. It is hoped that the findings will serve as a strong foundation for further evolution of the current development of an effective relationship-based procurement model in Malaysia.

Acknowledgements

The authors would like to thank the Ministry of Higher Education Malaysia (MOHE) for the funding provided under the Fundamental Research Grant Scheme (FRGS: Project VOT No. 4F196), without which it would be impossible for the authors to finish the study.

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