

# A Study on Critical Success Factors for the Effective Program Management in Multiple Project Environments in Indian Retail Construction

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**Abstract:** In the Indian Retail construction industry, multiple project environments (MPE) exist where challenge are in handling more than one project simultaneously. The success of the implementation of MPEs lies in the success of the Program Management team by way of pragmatic allocation of resources and by identifying the Critical success factors (CSF). The current lack of clarity associated with the discipline and the practice of program management in this no one-knows-what-happens-next state of the global economy calls for a better understanding, insight and analysis of what is/are critical to successful construction programs. A total of 35 numbers of usable questionnaires were received and analysed, 3 semi-structured interviews were conducted with program management experts and critical literature review was conducted to establish, ascertain and document the factors that are critical to the success of implementation and the practice of program management in the construction environment. The findings in this research are based on a theoretical and pragmatic synthesis of literature review, questionnaire survey and semi-structured interviews with program management experts. The study seeks to provide a better understanding, insight and analysis of the factors critical that are critical to the success of any effective construction program and the way forward.

**Keywords:** Program management, Critical success factors (CSF), multiple project environments (MPE).

## 1. INTRODUCTION

Organisations are taking management initiatives by shifting the paradigm of project management to the management of multiple projects (Blomquist and Müller, 2006, Pennypacker and Dye, 2002, Evaristo and van Fenema, 1999) as an efficient vehicle to successfully deliver improvements and changes due to the unpredictable economic climate (Shehu and Akintoye, 2010). For the construction industry, it needs to assimilate new steps to intervene with such uncertainties to survive. Thus managers are altering their strategic direction to expand opportunities and expand capacity for marketing, sourcing, introducing new infrastructure and taking advantage of distributed location (Dooley et al., 2005).

Studies on the management of multiple projects are dominated by the high technology industry (Caniëls and Bakens, 2011, Patanakul and Milosevic, 2009, Maylor et al., 2006) specifically on the new product development. Few studies have examined and little analytical attention has been paid to the management of multiple projects environment within the construction industry (Gholipour, 2006, Blismas et al., 2004, Dubois and Gadde, 2002).

Furthermore, most studies have demonstrated the existence of multiple projects environment from the context of developed country. Although studies on construction industry in the context of developing country has been acknowledged in the literature (Ngowi, 2002, Ofori, 2000), little recognition has been given to the multiple project environments within the construction industry.

It is important to recognise the management of multiple projects environment from the developing country because the construction industry among countries is different as presented in the cultural studies of the construction projects, firm and site by Baiden and Price (2011). Thus, the complexity of challenges will be different in the level of socio-economic stress, chronic resource shortages, institutional weaknesses and a general inability to deal with the key issues (Ofori, 2000).

## 2. BACKGROUND LITERATURE REVIEW

### 2.1 Multiple project environments

Initially, MPEs was referred to, “an organisational level environment in which multiple projects are managed concurrently” (Patanakul and Milosevic, 2009, p. 217). However, this definition needs to be extended not to focus only on more than one project managed simultaneously, but also at various locations (Evaristo and van Fenema, 1999), on the possibility of involvement from multiple organisations (Dubois and Gadde, 2002)

These two features of multiple projects at various locations and involves multiple organisations are important in defining MPEs. The first feature stressed on various locations because within the construction industry, projects are influenced by geographical location which includes international and domestic distribution whether in a local region or elsewhere.

**Table 1:** summarise the discussion on the challenges in the MPE.

MPE / Challenges	Uncertainty	Interdependency
Organisational Input	Project selection (Patanakul and Milosevic, 2009) To understand the project priority, match between the ability of project managers and the project assignments Resource allocation (Elonen and Artto, 2003, Fricke and Shenbar, 2000)	
Management Processes	Lead group of projects (Patanakul and Milosevic, 2009, Patanakul and Milosevic, 2008) -Problem solving (Engwall and Jerbrant, 2003) -Information sharing (Elonen and Artto, 2003) -Multitasking (Patanakul and Milosevic, 2008) -Communication (Lycett et al., 2004)	Management of single projects (Shehu and Akintoye, 2010) -Project Management Process (Hashim and Chileshe, 2012) To adjust and link schedules to match available resources, and remove unnecessary variation in workloads of project managers Inter-project interactions (Milosevic, 2009, Fricke and Shenbar, 2000)
Project Output	Project manager's expectation (Patanakul and Milosevic, 2009, John et al., 2000) Project's benefit (Shehu and Akintoye, 2010)	

This distribution is due to the potential benefits of the physical location and where professionals are involved in the project operation location (Zavadskas et al., 2004). One project can be performed in several sites concurrently, as long as the correspondent actions share the same objectives (Evaristo and van Fenema, 1999). The management of these projects is assumed to be either centralised or distributed located in any of the sites or nodes. The challenge of project's location of multiple projects is related to the focus on the co-ordination mechanisms, with the option of either focusing on inter-site or boundary spanning across sites, or concentrate on intra-site or boundary spanning across projects (Hashim and Chileshe, 2012).

The second feature originated from the construction management which is complicated by several organisations involved in the supply chain. The organisations are also engaged in other projects in which they have to coordinate their activities and resources with different sets of organisations. This affiliation shows that an organisation is capable in managing more than one project simultaneously in the construction industry (Dubois and Gadde, 2002) and supports project-based structures (Söderlund, 2004). The increased use of project-based structures defines the nature of multiple project environments with the involvement of multi-project organisations.

From these features, the representation of challenges instigated from the complexity in managing multiple projects could be illustrated. For example, the projects located in multiple locations will focus on the co-ordination mechanisms, on single unit without segregating the projects into multiple units in sharing the projects goal and objectives even though they are widely distributed from each other (Desouza and Evaristo, 2004). On the other hand, projects which involves with multiple organisations will easily create conflict between the team mates, and impede the establishment of "organisation culture" of multiple projects environment particularly between different levels of management or between other projects, especially when competing after the same resources (Fricke and Shenbar, 2000, Olford, 2002). Therefore, these features illustrate the challenges in managing the MPE that will minimise the effectiveness in managing the projects.

### **3.2 Program Management and its benefits in managing MPE**

Program management is not a synonym of project management (Pellegrinelli, 1997), but an integrated approach that can streamline the effective delivery of projects (Gray, 1997); Lycett et al. (2004) observe that the former has its roots in the latter and according to Milosevic et al. (2007) the two concepts are often confused. Therefore, it has been observed that organisations use the terms 'project management' and 'program management' interchangeably (Ferns, 1991;

GAPPS, 2008), whereas the two are completely different but directly related to one another (Reiss, 2003). For program management to succeed there is need to define and differentiate its practices from those of project management to avoid leaving them to serendipity. Programs tend to be dynamic in nature with intense cross-discipline and cross-project integration (OGC, 2003), in which the actions of one functional project affects, supports and reinforces the other project teams involved in the programme (Milosevic et al., 2007; Thomsen 2008). On the other hand, program management involves management of a group of projects (Ferns, 1991; Lycett et al., 2004), while project management deals with the effective management of activities to deliver the project within the approved cost quality and time (Turner, 1993; Burke, 2003). The high level of synergy and integration in program management requires the identification of certain CSFs that will facilitate efficient delivery (OGC, 2003; Milosevic et al., 2007).

In program management, critical success factors are identified to enable tracking the value of program outputs; they should enable proper assessment of the few fundamental aspects of the program that must be done well to achieve the objectives of the program (Wren 2003). While the relationships project management and program management are observed to be synergistic (Milosevic et al., 2007), the CSFs for project management may be insufficient to those of program management (Reiss, 2003). In the same manner that program management emerges from project management (Ferns, 1991; Lycett et al., 2004), the CSFs of the former may also be related or emerged from the latter; therefore, based on the above established relationships between projects and program, this research reviews, establishes and analyses the CSFs for effective program management, which may have emanated from project management.

Rockart (1982) first used critical success factors (CSF) in the context of information systems and project management and a number of researches have been subsequently reported in this field. Rowlinson (1999) and Thomsen (2008) state that CSFs are those fundamental issues inherent in the project (s), which must be maintained in order for team working to take place in an efficient and effective manner. CSFs require day-today attention and operate throughout the life of the project. OGC (2007) believes that CSFs are limited in the number of areas that, if fully addressed, would ensure the successful completion of the program. Identifying and communicating the CSFs ensures that everyone in the program team is focused.

**3.3. Critical Success factors for handling MPE projects by Program Managers**

Below are some of the CSF factors that are found to be critical to the success of Retail construction MPE programmes:

**Table 2 : Factors affecting the success of the construction projects ( Chan, 2004 )**

<b>Factors affecting project success</b>	<b>Variables</b>
Project related	<ol style="list-style-type: none"> <li>1. Type of project</li> <li>2. Nature of project</li> <li>3. Number of floors of the project</li> <li>4. Complexity of the project</li> <li>5. Size of the project</li> </ol>
Procurement related	<ol style="list-style-type: none"> <li>1. Procurement method</li> <li>2. Tendering method</li> </ol>
Project Management related	<ol style="list-style-type: none"> <li>1. Communication System</li> <li>2. Control mechanism.</li> <li>3. Feedback capabilities.</li> <li>4. Planning effort.</li> <li>5. Developing an appropriate organisation structure.</li> <li>6. Implementing an effective safety program</li> <li>7. Control of contractors works.</li> <li>8. Overall managerial actions.</li> </ol>
Project Participant related (Client, contractors, sub contractors, manufacturers )	<ol style="list-style-type: none"> <li>1. Client experience.</li> <li>2. Nature of client.</li> <li>3. Size of client organisation.</li> <li>4. Clients emphasis on low construction cost.</li> <li>5. Clients emphasis on high quality construction.</li> <li>6. Clients emphasis on quick construction.</li> <li>7. Clients ability to approve.</li> <li>8. Clients ability to make decisions.</li> <li>9. Clients ability to define roles.</li> <li>10. Clients contribution to design.</li> <li>11. Clients contribution to construction.</li> <li>12. Project teams leaders experience.</li> <li>13. Technical skills of project teams leaders.</li> <li>14. Organising skills of project teams leaders.</li> <li>15. Motivating skills of project teams leaders.</li> <li>16. Project teams leaders commitment to meet cost, time and quality.</li> <li>17. Project teams leaders early and continued involvement in the project.</li> <li>18. Project teams leaders adaptability to changes in the project plan.</li> <li>19. Project teams leaders working relationship with other stakeholders.</li> <li>20. Support and provision of resources.</li> </ol>

External Related	<ol style="list-style-type: none"> <li>1. Economic environment.</li> <li>2. Social environment.</li> <li>3. Political environment.</li> <li>4. Physical environment.</li> <li>5. Industrial relations environment.</li> <li>6. Technologically advanced.</li> </ol>
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1. Planning and establishing priorities.
2. Strategic review and approach.
3. Simplicity and easiness of techniques.
4. Learning and development.
5. Management infrastructure and understanding programme and its stakeholders.
6. Clarity/consistency of vision and benefits focus.
7. Coordination of projects and managing the transition/changes.

Having discussed the CSFs for effective programme management, these factors were listed into a Survey questionnaire to analyse and assess their effects on successful programme management practice.

To provide the exploratory and descriptive data analysis for CSFs for effective programme management, criticality, mean and Factor Analysis were employed in the statistical analyses.

### 3. RESEARCH METHODOLOGY

The findings in this research are through the triangulation of

1. Literature review,
2. Questionnaire survey and
3. Semi-structured interviews in the Retail construction industry.

In the survey, 250 postal questionnaires were sent using a convenience sampling; the sampling was conducted as the target (programme management organisations) population was not known by the researcher as highlighted by (Denscombe 2007; Fellows and Liu 1997; Bryman and Bell 2003). A total of 35 usable completed questionnaires were received and analysed, the number implies that approximately 14% of the total sample contacted has participated in this study.

Survey findings indicates the need for deeper understanding of the prerequisites of programme management, hence may justify the low response rate in this research. In the semi-structured interviews, to increase the depth and breadth of programme management knowledge, responses were also collected, analysed and synthesised from other non-construction programme management organisations. The sample of the population for the semi-structured interview was acquired by providing a column in the questionnaire for participants willing to be interviewed to provide their details; use of snowballing approach (Denscombe 2007) and referral by the programme management experts (Wisker 2008) were

also employed to develop an adequate interview sample. At the end of the interview sessions, a total 3 interviews were conducted with programme management experts.

The results in the questionnaire survey were analysed using SPSS 17 and Microsoft Excel, the CSFs were analysed using Criticality Index and a comparison of the data was conducted using a t-test and Factor Analysis which reduced the CSFs into manageable groups.

#### 3.1 Criticality Index for critical success factors

Abdul Kadir et al. (2005) used the Importance index to evaluate the factors affecting construction labour productivity for the Malaysian construction projects. Kometa et al. (1995) used a relative importance index to analyse the attributes of clients' organisations, which may influence project consultants' performance. Odeh and Bettaineh (2002) used importance to determine causes of construction delay in traditional contracts. Chan and Kumaraswamy (1997) also applied a relative importance index in their comparative study of the causes of time overruns in Hong Kong construction projects; Cheng (2002) used Importance Index in discussing technology foresight. As a result of its popularity and accuracy, this research also adapts Criticality Index in ranking the CSFs for effective programme management.

To determine the relative importance index of the listed skills and competencies, this research uses Odeh and Bettaineh's (2002) formula due to its clarity, simplicity of use, and the similarity between the data in this research and the data in their study. The analysis used the weighting used by Cheng (2002) as the values set for the Likert scale in this research aimed to add to a total of 1. Cheng used the weighting of the importance from 0.00, 0.25, 0.5, 0.75 and 1. In this approach, the weighting substitutes the position of the Likert scale. The maximum criticality index ( **Equation 1** ) of any of the skills factor should not be more than 1, and any skills and competencies with the highest value between  $0 \leq 1$  are considered important.

$$C = \frac{\sum_{i=1}^5 W_i X_i}{\sum_{i=1}^5 X_i}$$

**Equation 1: Criticality index**

Where:

C = Criticality Index.

i = responses category index = 1,2,3,4 and 5 (position on the Likert scale).

W<sub>i</sub> = is the weight assigned to i<sup>th</sup> response = 0, 0.25, 0.5, 0.75 and 1 respectively (Cheng, 2002)

X<sub>i</sub> = frequency of the i<sup>th</sup> response given as percentage of the total responses (Odeh and Bettaineh, 2002).

The CSFs are ranked in ascending order of their criticality based on the rating in the responses.

**Table 3: Presents the criticality analyses indices for the critical success factors for the successful practice of construction programme management in the Retail construction environment.**

Critical Success factors	Total Responses
	Criticality Index
Effective planning	0.85
Understanding the stakeholders attitude	0.83
Establishing program priorities	0.79
Cross discipline coordination	0.79
Effective communication.	0.77
Proper coordination of projects	0.76
Effective risk management	0.739
Effective time management	0.725
Effective performance management	0.72
Strategic focus on programme	0.705
Effective budgeting	0.693
Cross project coordination	0.691
Clarity and consistency of vision.	0.678
Smooth handover to business operation on completion	0.672
Cross discipline problem solving	0.650
Clear benefits target	0.648
Effective change management	0.641
Management infrastructure	0.636
Simplicity of programme	0.629
Easiness of techniques used	0.627

According to Table 3, 'Effective planning' is the highest critical success factor with the Criticality Index of 0.850, then 'Understanding stakeholders attitude 0.83. Programme planning ie establishing program priorities is essential for the success of a programme (Bartlett, 2002; Reiss et al., 2006); as a result, it may be directly linked to the success of the implementation and practice of construction programme management.

#### 4. CONCLUSION

The effective programme management though has its roots in the project management, but the two are not the same; hence the two though are related but their CSFs may also be related, but may never be the same. To successfully manage construction programmes, the programme management teams are expected to closely examine and establish those factors that are critical to the success of their programmes. The CSFs presented in the research on Retail construction are by no

means the only ones that programme management organisations should pay attention to as the factors may differ from one organisation and programme to another. The reduction of the factors will provide the stakeholders, Academicians, Project Organisations and consultants with more clear and relevant groups, rather than being puzzled with a long list of factors. However, the organisations can adapt and generate other groups based on the nature and requirements for the critical success factors provided in this study, rather than a heuristic approach to the requirements.

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