

TRADITIONAL PROJECT MANAGEMENT APPROACH, INDUSTRY CHALLENGES AND KEY ATTRIBUTES: A CASE STUDY OF CONSTRUCTION PROJECT MANAGEMENT IN SRI LANKA

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Abstract

Construction project performance is critical for any nation because these projects consume a considerable amount of resources in the country and, at the same time, provide major contributions to the economy of the country. On the other hand, project failures are significant due to the challenges associated with the complexity, nature and dynamism of the environment. Therefore, identifying attributes of traditional project management approaches currently being applied in construction is essential in addressing the challenges and reducing project failures. An extensive literature search and review was conducted followed by a qualitative study among twelve experts in the construction industry of Sri Lanka. This paper will attempt to investigate the challenges in terms of key attributes of the traditional project management approach in construction project management and the expected attributes of an innovative approach. The results are used in the main research to propose a new hybrid concept in project management.

Keywords: Traditional Project Management, Challenges, Project Failure, Key Attributes of TPM.

1. Introduction

Project failure rates are abundant and unbearable in Sri Lanka (Silva et al., 2015). In the Sri Lankan construction industry, the delay occurs in almost all projects continuously (Jayalath, 2010), (Pandith, 2001; Samarakoon, 2009). Researchers, in their study of challenges of the industry in Sri Lanka, to reach desired performance, have confirmed that applied project management methods are facing critical challenges and that it is vital to provide a better solution.

Senaratne & Jayarathna (2012), in their research done in the construction industry of Sri Lanka, emphasise that with the changing economic environment, managers of construction companies and projects look for emerging new construction management philosophies (Senarathna & Jayarathna, 2012; Perera & Halwathura, 2012). The construction industry of Sri Lanka needs severe and urgent modifications and attentions according to De Silva et al. (2006). Therefore, as the initial step, the major challenges and key attributes of traditional project management are investigated.

1. 1 Project Failure in Terms of Existing Traditional Project Management (TPM) Approach

In a paradoxical way, project failures, delays, and disappointments are above the average in the construction industry, although modern construction techniques, and methods have become standard across the industry. With most projects failing to meet time and budget goals, and many projects not fulfilling their business objectives, there seems to be an alarming gap between the needs of the discipline and what we know in order to fix them. The gap that exists between the concepts dominating the formal discipline or traditional project management and the way things are encountered in the real, dynamic project environment is a major issue in the context of the construction industry (Shenhar & Dvir, 2007). The current project management body of knowledge is rich and helpful and forms the foundation for basic training and learning project management. Thus, many of the traditional project management techniques became standard and were transformed into tools and applications, with increased detail and sophistication. But as project results demonstrate, all of this seems to be insufficient.

In the current TPM practice, the main plan is generated by the general contractor and the subsequent comprehensive construction plan grows with input from different engineers and sub-contractors. This process is a breeding ground for miscommunication. In turn, poor communication leads seemingly inevitably to budget and schedule-busting scope creep. An alternative and even more destructive outcome may be the creation of scope gap, with terrifying impacts on quality and risk as well as costs and schedule.

In addition to the typical issues related to resources and budget, a partial list of the constantly shifting constraints that must be altered in order to maintain a construction project schedule include environmental factors such as: weather, geography, geology, environmental and other regulatory constraints, and numerous stakeholders representing a diversity of interests in the project. Therefore, maintaining a construction project schedule may often be taking place in an environment that can quite literally change in a matter of hours and thus require a more specific management approach.

Construction project budgets, always subject to cost-cutting initiatives, and the thin margins that do exist require diligent attention to costs and resource requirements at a fairly granular level of detail. This has not been achieved in a satisfactory manner under the current management system, as per the statistics of budget overruns in the projects.

In a TPM approach, plans and estimates are normally made once, in a "big bang," front-loaded approach, and the rest of the project is spent adjusting to reality. Project managers, rather than working with their team to facilitate their creativity, to navigate obstacles, and to provide leadership and mentoring, are often found tucked away in an office somewhere, adjusting Gantt charts and task lists to conform to the plan. (Freedman, 2010) This creates many problems, such lack of space for any change or any option for facing the uncertainties, hence causing failure of the project in terms of time, cost, scope as well as quality, and ultimately the customer satisfaction.

In a TPM planning scenario, once the team has developed its task-based estimate, that estimate typically doesn't change throughout the project. The actual time will change, as reality intrudes on our idealized estimates; this creates discrepancies between planned and actual hours that can cause project managers to spend inordinate amounts of time accounting for the difference and explaining it to the client. DeCarlo (2004) stated that traditional project management, which is characterized by a linear approach to product development, is not effective in today's complex environment. He further explains that traditional project management works only if the project context is stable and certain. For example, a well-planned, step by step process may be

applicable in a highly stable environment. (DeCarlo, 2004) Traditional project management involves very disciplined and deliberate planning and control methods. With this approach, distinct project life cycle phases are easily recognizable. Tasks are completed one after another in an orderly sequence, requiring a significant part of the project to be planned up front as shown in the figure below. (Hass, 2007).

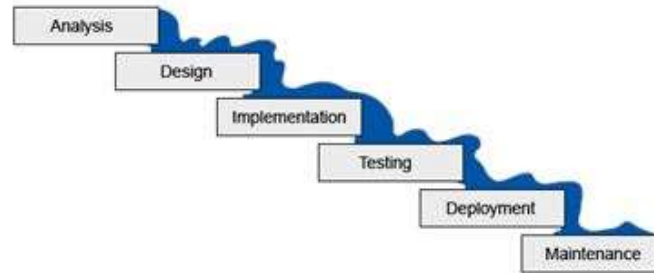


Figure 1: Traditional waterfall model (source <http://www.agile-scrum-master-training.com/agile-project-management/>)

2. Literature Review

2.1 Attributes of TPM Approach and Project Failure

Inflexibility, low customer orientation and difficulty in facing complexities are commonly seen issues in current construction project management (Spundak, 2014), (Marle & Vidal, 2016). In the modern dynamic business environment, this directly influences the performance of a project. Furthermore, the tools and techniques of TPM are designed for static conditions, whereas the nature of the industry is highly dynamic.

The strengths of traditional project management as explained by researchers are that it is characterised by well-organised and premeditated planning and control methods for stages of the project life cycle (Hass, 2007; Thomsett, 2002). However, TPM's distinguishing characteristic is making sure that tasks for the whole project are carried out in this predetermined orderly sequence. Although this was seen as a solution on one hand (Cadle and Yeates, 2008), some researchers have seen this as a major failure in the face of a dynamic project management environment (Leybourne, 2009; Cicmil, Williams, Thomas, & Hodgson, 2006). It is elaborated that, this falls short because reality shows that projects are not sequential in nature (Collyer and Warren, 2009).

The merits that are put forward for the waterfall model by Hass (2007), include its simplicity and ease of scheduling in laying out steps for development. In addition, the waterfall model is favoured for its ability to improve quality management through its verification and validation processes (Cadle and Yeates, 2008). In addition to that, the 'command and control' style of management used in projects inhibits trust and hence reliability (Owen R. , Koskela, Henrich, & Codinhoto, 2006). It is seen by Adjei & Rwakatiwana (2009) that it is these merits that have enabled the waterfall model to become the mainstay of project management. In contrast, Thomsett (2002) argues that the waterfall model is "poorly suited to the chaotic and client-driven business environment of the 21st century" because of its tendency to be rigid. The negative attributes and their results cited by researchers are tabulated below.

Table 1: Attributes of TPM

Attributes of TPM	Result	Reference
Rigid, structured and inflexible	Requirements are defined and approved before development starts, which makes it difficult to make changes in product specifications later in the process.	(Gutiérrez, 2012), (Mohomad, 1999)
No customer focal point, mainly process centric	The response to customer's needs become a slow and aggravating process in the traditional approach due to lack of customers' center of attention. Communications are channeled through higher management. Top level managers then pass on all difficult issues to the functional manager	(Kerzner 2003), (Nerur et al., 2005)
Good ideas are held back	Structured sequential flow of process does not give sufficient pace for innovations. Change is not facilitated In the TPM the specialist constructors, who deliver the project, are involved in the project after the design is substantially complete, so they miss the opportunity to contribute their ideas in the design phase.	(Matthews & Howell 2005)
Lack of coordination	In the TPM method the subcontractors involved in the project work individually rather than as part of a team. There is no formal attempt to create any mutual commitment or expectations amongst them. This further increases low levels of communication among parties.	(Matthews & Howell 2005), (Nawi et al., 2014) (Mohomad, 1999), (Provebs et al., 2000)
Local optimization	The lack of integration among different functions, processes, or trades, hence, lack of waste control with the planning and control process, and the need for not only verification but also monitoring of the efficiency of construction processes. Try to optimize their performance due to lack of mutual commitment and coordination, which drives them to defend themselves when something goes wrong at the expense of both the clients and other subcontractors	(Matthews & Howell 2005), (Formoso et al, 1999) (Provebs et al, 2000)
Holistic approach of defining objectives, deliverables etc.	Although the holistic approach creates the best, it creates more ambiguities in a complex project context where many uncertainties cause changes in objectives and deliverables requirements.	(Koskela, 1992) (Owen & Koskela, 2006), (Demir. Et al., 2012)
Most of the techniques are defined for a static environment	Most of the planning and scheduling techniques are static with deterministic parameters, creating unavoidable errors in scheduling and thus deliverables.	(Brucker, 1999)
Reactive	Attempts to control in terms of after-the-fact variance detection (Cost, time quality)	(Ballard et al, 2004), (Aziz & Hafez, 2013)
Unidirectional flow of communication	Denying opportunities for retrospection. Does not facilitate learning and perfection.	(Owen et al, 2006),

3. Methodology

Interviews are most appropriate where little is already known about the study phenomenon or where detailed insights are required from individual participants (Gill et al, 2008). Sekaran (2003) suggests that these types of semi-structured interviews can be conducted either face to face or over the telephone. In this study semi-structured interviews were conducted in both modes, The semi-structured interviews were conducted to gain an insight into the current status of the traditional project management approach in the industry, key attributes and suggested attributes of efficient management concepts. To gather this type of specific detail, selecting the suitable sample was a challenge. According to Bryman (2012), semi-structured interview samples can be used by the researcher as appropriate. Since this is pertaining to the project management concepts as well as the construction industry applications involved, representation of both areas is considered. The sampling method chosen was purposive, judgmental sampling. This method is considered as the most suitable sampling method for selecting experts for interviews, as any other sampling method does not serve the purpose. According to Umasekaran (2003), when the sampling should be confined to specific types of people who can provide the desired information, because they are the only ones who have it, purposive sampling methods should be used. Judgment sampling involves the choice of subjects who are most advantageously placed or in the best position to provide the information required. (Sekaran, 2003).

The size of the sample depends on the purpose. (Baker & Edwards, 2012). Bryman (2012) even mentioned that it may vary from 5 to 350 for a purely qualitative research. According to Adler P. in her paper among those 14 papers in NCRM review, she advises readers to select the sample size in the range 12 to 60. In this study, the number of experts is selected as twelve. These twelve were selected from PMP certified managers and qualified construction managers with experience of more than fifteen years and who were currently in the industry.

The semi-structured type sixteen questions were formulated to get the views from the experts in construction project management. The instrument is adapted from the work of Jayalath (2010), Demir (2013). The set of questions asked during the interview had the following objectives:

- i. To investigate the challenges and causes of project failure in the context of the Sri Lankan construction industry in terms of the existing traditional project management (TPM) approach
- ii. To identify attributes of TPM that contribute to project failure
Qualitative analysis of the interviews was managed with the Nvivo 11 data managing facility.

4. Data Analysis

Data is analysed under three main themes; challenges in the industry, attributes of TPM, and future expectations which may blend to trends in PM. The interview transcripts of Construction Project Managers (CPM 1 –CPM 4), Project Management Consultants (PMC 5-PMC8), Project Engineers (PE 9- PE 10) and Project QS (PQS 11- PQS 12) are used for this analysis.

4. 1 Challenges in the Industry

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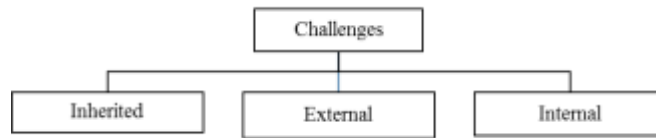


Figure 2: Three main categories of challenges

Under the theme ‘Challenges’, three main codes are identified. The answers carried challenges under three main categories as the ones inherited to the industry, challenges due to external elements, and challenges arising inside the project itself.

Inherited nature of the industry -

Most of the respondents pointed out that the nature of the industry is the most challenging factor that must be addressed by a project manager. Some of them have emphasised that “the initiation of the project or the planning is completely done by one party, then during construction different subcontractors in different work areas re-establish their own plans and schedules; although these two stages should be coordinated, a proper coordination is rarely seen.” The same phenomena is explained as “insufficient integration on design and built operation” as well as “fragmented nature” by few others. They pointed out that the existing management system is incapable of handling this fragmented nature and it further intensifies the problem.

Respondents indicated that the nature of long project timelines is also a challenge, since it is causing the high fluctuation of budget and schedule targets. Hence, they suggested that incremental phases should be identified to avoid such failures. The complexity of designs as well as the project process were also considered as challenging factors by the interviewees. It was confirmed that “the complex nature of the construction industry contributes further to chaos in situations due to ambiguities and uncertainties. Uncertainty results in the inability to pre-evaluate project objectives and characteristics of the project elements as well as the impact of actions and decisions”.

External -

Among the factors that are external to the project environment are the financial issues due to changes in the financial environment of the country, and difficulties due to the lack of government policies or ineffective policies to support the construction industry. For instance, government tender procedures based on low price-based are sometimes shown to be very inefficient. Other than that, according to respondents, policies are also one of the main concerns.

The political instability of the country directly influences the economy of the country and the construction industry as well. In the context of government as well as private projects, bribes/corruption and favours are considered a huge drawback and a challenge a project manager may face in the construction industry of Sri Lanka.

In addition to that, scarcity of materials and high cost of materials in the construction industry in Sri Lanka also is a critical challenge.

Internal –

Internal challenges are identified as the factors relating to a combination of management deficiencies and other project environment related features. It is emphasised that poor cost planning at the initial stage of the project can be considered as a challenge in later stages because most of the time the initial bidding cost is very low and unrealistic. High labour turnover is highlighted by many respondents saying that “it is a challenge recruiting skilled

labour as well as retaining them”. Mainly due to poor site conditions, and most of the sites are concentrated on urban areas, so it is difficult to recruit people for a lower wage. Low level of administrative flexibility is indicated as a challenge, in current projects lesser authority is allowed for managers to make any changes or add any innovative practices due to this low level of administrative flexibility.

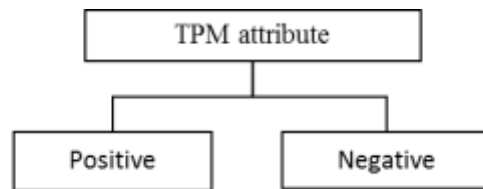
When comparing the construction industry of developed countries with Sri Lanka, inadequate technological knowledge among workers, low level of technology transfer and low level of usage of IT is observed and it is certainly a challenge in the current developed business environment and expectations of clients and other stakeholders.

Safety issues are given minute consideration. There is a severe shortage of safety officers and safety training teams in this field. The attitude of workers involved in high risk activities is also a challenge, since they do not understand the importance of safety gear or safety measures.

4. 2 Attributes of Traditional Project Management approach

In answering the questions, most of the respondents agreed that the current practicing project management method is more towards a traditional project management method with a sequential flow. They have further named few techniques such as PERT, Gantt chart, MS project scheduling tools as they are using them in their projects.

The attributes were explained under two categories;



To answer the question regarding the key attributes of current practice, seven out of twelve respondents answered that it does not address the issues created due to the fragmented nature of the industry. Their answer says that “traditional sequential management practice does not facilitate coordination between different parties in a project, rather these are considered as separate phases and hence difficulty in delivering one common objective. In the current practice a clear lack of integration of different parties, services and job profiles is seen.” Lack of coordination is highlighted in the current context and it leads to communication barriers between different areas too. It is interpreted that these results are due to the structured and rigid characteristics.

Low customer focus and reluctance to change are negative attributes of current practice. It is stated that changes are not manageable in the traditional practice since there is a limited flexibility. The deliverables are not defined for different stages; rather it is considered as a whole complete product and since financial planning and scheduling are done in the initial stage, change orders are considered as completely negative. It is indicated that due to long procedures and inflexibility, changes are not entertained.

The structured process does not allow managers to take quick decisions. Many documentation procedures and monitoring of process are not effective in the construction project, which carries many ambiguities and uncertainties.

Project management consultants pointed out that financial estimation and schedule of the total project is done considering static conditions and is not achievable in many instances due to the dynamic nature of the environment.

However, construction project managers mentioned, “traditional project management practice is more reliable and more methodical. All the processes are predefined and clear instructions are to be followed, unlike new concepts which have limited history, limited awareness among workers and limited guidelines available in the construction industry.

4. 3 Expected New Project Management Approach

Although the interviews are focused on achieving the objective of investigating challenges in the industry and identifying key attributes of TPM, some more questions are included to gather the information regarding the current practice, and expert views regarding the new trends in project management before analyzing it through the questionnaire survey. Most of the project managers have a knowledge about new concepts such as lean concepts and their application to a certain extent. However it is highlighted that, “the facilities such as reliable communication, proper infrastructure for such a move is not enough and it will be a risk to start such an approach without having proper communication channels, highly motivated work teams, clear instructions on deliverables etc. Since new concepts are basically about reducing waste and preventing idling of people, it is agreed that “such a method is favorable even though it is not possible to practice hundred percent, but a few concepts and techniques may be adopted in the existing system”.

Initially, a negative note was indicated regarding the iterative management of a construction project as designing and construction are two different phases. Although iterative progression may not be possible as applied in a software project, the incremental progression will definitely minimize the risk of discrepancies in time and cost forecasts in the end because incremental progression highlights the deviations at different levels. One extremely positive note was about the flexibility and teamwork enhanced in agile concepts. Customer focus, flexibility and higher coordination will be improved with agile concepts such as iterative progression according.

As the conclusion, respondents’ opinions regarding the suitable additions to current practice towards positive changes in the construction industry of Sri Lanka were summarized. They were more concerned about possibilities and techniques for increasing the coordination between different phases and different specialties by improving communication between parties.

Change order management needs more customer involvement and proactive action to satisfy the customer. “Reluctance in making any changes requested by the customer and longer procedures make it worse. Variation orders must be handled swiftly to achieve win-win situations for both parties.”

“Increasing efficiency and productivity by improving material supply and reducing idling time and meet project deadlines. Faster response and information sharing may ease the situation”. In addition, current project management methods are lagging in the area of taking proactive decisions. Mainly it is monitoring the situation and reacting accordingly. This culture should be changed with more interaction between different phases and improve pro-activeness.

It is emphasized that the waste reduction in both material and man hours at all levels may create a considerable difference in current performance in construction projects. “Waste is not measurable since it occurs as material waste as well as man hour waste, hence not accounted completely when budgeting. Therefore all type of wastes are causing budget overruns.”

Recruiting and retaining methods by introducing more attractive means and measures is also pointed out by construction project managers saying that “a new set of workers every day makes the task impossible. Most of the skilled workers are looking for better opportunities and benefits. Therefore higher wages, better facilities and recognition in a team is needed to keep the place attractive.”

5. Findings and Discussion

5. 1 Investigate the Challenges and Reasons For Failure in Terms of Existing TPM

The interviews with experts and the qualitative analysis was focusing on investigating the challenges and reasons behind project failure in the context of the Sri Lankan construction industry, mainly in terms of the existing project management approach. Table 4-1, a summary of qualitative analysis, lists out the main challenges in the industry as the:

- i. Fragmented nature,
- ii. Complexity
- iii. Ambiguity of objectives and deliverables
- iv. Uncertainty
- v. Economic and political instability
- vi. Unrealistic costing
- vii. High labor turnover

The views of experts are further verified by the previous research findings regarding the challenges and reasons for failure in the construction industry. (Bandulahewa, 2013; Salem et al, 2006; Salleh, 2009; Silva et al, 2006; Nemathullah & Naik, 2016; Wijekoon & Attanayake, 2012).

5. 2 Identify Key Negative Attributes of TPM

Experts were explaining that the traditional project management system is existing in the industry although there are many evidences of project failure, because of its methodical structure and the reliability of not missing out anything.

The key negative attributes highlighted by most of the experts as summarized in table 4-1 as well as in the literature are,

- i. Rigidity
- ii. Structured nature
- iii. Holistic approach
- iv. Tools and techniques consider static status
- v. Reactiveness

Rigidity is identified by many researchers as a negative characteristic as it creates many problems such as low customer relations, bad change order management, customer dissatisfaction, communication barriers etc. (AIAOrg, 2013; Adjei & Rwakatiwana, 2009; Ballard & Howell, 2004; Demir, 2013; Marle & Vidal, 2016) The holistic approach of the traditional project management method is sometimes considered as a positive attribute. (Randel, 2011). However, it creates more negative results than positive (Demir et al, 2012; Koskela, 1992; Owen et al, 2006). The structured nature of the current project management method decreases levels of learning from past failures and experience, which is considered as an important concept for all engineering professionals. (El-sokhn & and Othman, 2014).

Wysocki explains that TPM focuses on meeting the plan driven parameters; time, cost, scope and that the original proposal is the best in the respective business climate. Unfortunately, the project climate is not static at all and it needs a moving target (Wysocki, 2011). This factor is verified by the experts in the industry, highlighting that the tools and techniques used in

determining project targets in TPM are designed for a static status. Therefore, using tools and techniques designed for a static status is also considered as a negative attribute in TPM.

The waterfall method is a sequential flow of work and the planning, execution and monitoring of the discrepancies at that point is the normal procedure. This is identified as a more reactive and a negative way of managing projects in present competitive conditions.

5. 3 Expected New Concepts

In addition to the two objectives, the analysis further discovered details on the possible application of new and innovative approaches in project management. All the respondents agreed that the project management method needs improvements, a fact emphasized by past researchers in Sri Lanka. (Senarathna & Jayarathna, 2012; Perera & Halwathura, 2012; De Silva et al.2006).

Most importantly, the experts' views regarding the expected contributions of new management concepts acted as one of the bases for deriving the framework of hybrid concepts. They specified the deficiencies that are not effectively addressed by the TPM and proposed that effective communication among all the parties, proper coordination and positive change order management, clear objectives and deliverables, waste minimization, and learning from experience for perfection are the most important factors for a positive improvement of project performance.

Conclusion

The current status of construction project management is in need of severe attention and should be provided with better concepts and ways of management. The main challenges faced by the industry are due to the inherited nature of the industry, internal factors such as management inadequacy, insufficient technological development and limited usage, recruiting and retaining of labour, and external factors which are economic, political and social. The key attributes of traditional project management are incapable of resolving problems, and it further increases deficiencies. Therefore, it is suggested to study project failures in terms of the attributes of the traditional project management approach and to develop new management concepts and trends to alleviate the problems and increase project performance.

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