STRATEGY: TOWARDS ITS APPLICABILITY FOR SUCCESSFUL PROJECT DELIVERY

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Successful project delivery is somewhat elusive because cost overruns, time extensions and quality failures have become common features on construction projects. Advanced database software packages and computer aided design, using nD modelling and artificial intelligence have been developed, but these solutions are inadequate to mitigate construction failures. Some studies suggest strategic approaches as the ideal alternative for successful construction project delivery. The pros and cons of this suggestion are reviewed in this paper. The key objective is to proffer strategy-led approaches as the best practice in construction project management, recognising the drawbacks in current project management practices. It is part of an on-going initiative to determine the applicability of a strategy-led approach to successful construction project delivery. The study on which this paper is based reviews different solutions available to planning for successful construction project delivery. The larger study aims to gather successful project delivery strategies that project managers use in project delivery. Successful project managers will be recruited and questionnaire surveys and structured interviews will be employed to evaluate their abilities to cope with project complexities, dynamisms, uniqueness and uncertainties. Contextual information on the larger study programme is provided while concluding with postulations for the adoption of a strategy-led approach to construction project planning. The strategy led approach is suggested as a root for the adoption of both reflective practice and technical rational paradigms. The authors believe there are benefits that could be derived from taking this conceptual approach to construction project delivery.

Keywords: project failures, project success, strategies.

INTRODUCTION

Project failures and corresponding company failures are a problem in the construction industry. Several factors are attributable to these, some of which relate to the interactions of stakeholders, poor planning and resource management and exogenous factors (Fryer, 2004; Kumar, 2002; Chan and Kumaraswamy, 1997; Belassi and Tukel, 1996). The complexity, dynamism, uncertainty and uniqueness of the construction industry make decision making and planning for their success particularly difficult (Ballard and Howell, 1998; Baccarini, 1996; Betts and Ofori, 1992). A notable solution to construction failures is the improvement of planning methods (Hegazy and Mensi, 2010; Kumar, 2002; Dias and Blockley, 1995; Schon, 1992). In this light, planning and decision tools e.g. micro-computer based design software were developed to improve decision making and for problem solving. Yet these costly solutions have not successfully curbed project failures in the construction industry (Kumar, 2002). Various attempts have been made to identify critical success

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Ramanayaka, C and Rotimi, J (2011) Strategy: Towards its applicability for successful project delivery *In:* Egbu, C. and Lou, E.C.W. (Eds.) *Procs 27th Annual ARCOM Conference,* 5-7 September 2011, Bristol, UK, Association of Researchers in Construction Management, 869-878.

factors for project management, but the studies have little value to construction practitioners (Abeysekara, 2007). The identification of critical success/failure factors is useful, but what approach should be taken to achieve the critical success factors? The authors believe that developing a reliable construction planning approach for the industry to assist project implementation is required. The study proposes that a complementary planning approach using professional education, experience and qualities could yield a more strategic solution to project failures.

The study therefore reviews the literature on both the technical rationality (TR) and reflective practice (RP) paradigms in construction project planning. It presents arguments for and against these paradigms. It takes the premise that a strategy-led approach may be a more feasible approach to practicing both paradigms thus achieving project success objectives. The paper concludes with contextual information on the larger research on which the current paper is based. Information provided includes the research questions, aim and objectives.

The need for a new construction planning approach

Project success and failure have become a contemporary topic within the construction industry. Research shows that construction project failures in one form or the other is common, with construction companies being vulnerable to bankruptcy (Wong and Ng, 2010). For example, only about 43% of construction firms that began operation in 1998, survived after four years of operation in the US (Ganaway, 2006). Similarly delays and time overrun are prevalent on construction projects (Al-Momani, 2000). Research shows that 10%-30% of projects are delayed in Saudi Arabia (Assaf and Al-Hejji, 2006) and 70% of projects suffered delays during their execution in Nigeria (Odeyinka and Yusuf, 1997 cited in Sambasivan and Soon, 2007). Several factors could account for these poor construction business performances. Chan and Kumaraswamy (1997) suggested 83 indicative factors by which one could know that a construction project is under crisis. However, key contributors to project failures are poor project management practices and lack of skill/experience of management personnel (Ganaway, 2006).

New approaches have been suggested to improve the effectiveness of current practices in the construction industry (Hegazy and Mensi, 2010). Although when carefully examined, most of the suggestions focus on improvements to planning tools, rather than the creation of new approaches. As an example, there are suggestions for improving critical path method (CPM) as a planning technique for construction projects (Hegazy and Mensi, 2010; Jaffari, 1984). Jaffari (1984) suggested accurate estimation of crew's productivity and inclusion of buffers between activities to minimise the drawbacks of the CPM. Hegazy and Mensi (2010) on the other hand, developed the critical path segment method (CPS) to minimize the shortcomings of the CPM. They explain that their developed CPS crumbles the duration of an activity into separate segments with buffers added (instead of considering activity durations as continuous blocks of time). Hegazy and Mensi suggest improving communication by presenting daily segments on time through the CPS. There is no fault with these suggestions, but the question remains: how are they able to calculate activity durations and buffers correctly? There are many salient activities which require strategic thoughts which are not reflected in a prepared CPM (Clough, Sears and Sears, 2008). For example: what should be done? How should it be done and in what manner? What is the optimal start and finish times for an activity? It is therefore conclusive that an

approach that will support decision making and problem solving should be developed to address these shortcomings.

Further, Kumar (2002) explains that advance data based software packages and computer aided design were developed to enhance project management capabilities. Artificial Intelligence (AI) and nD modelling are some examples of these information management technologies. AI has the ability to capture and store expert knowledge and concerns human intelligence, experience and artistry (Dias and Blockley, 1996). Alternative solutions and the identification of strategies are possible with AI, but there are huge hurdles to applying AI in the construction industry (Fryer, 2004). Fryer suggests that the human brain is much more elaborate than even more advanced AI models. In any case, investments in computer technologies are huge for most construction companies and it takes time to familiarise with new software (Kumar, 2002). This reminds one of Schon's dilemmas of rigor or relevance resulting from technical rationality (Schon, 1992).

More recently emphasis shifted towards the improvement of decision making capabilities of project managers for successful project delivery. Zhoa, You and Zuo (2010) introduced an innovative critical chain method (ICCM) to manage situations under resource constraints and uncertainties. While Kessab, Hegazy and Hipel (2010) developed a decision support system (DSS) to resolve conflicts between project stakeholders. These developments address only some of the complex aspects in construction project delivery. Consequently project management practitioners would have to be thorough in many disciplines to tackle actual problems.

Critical success and failure factors have been identified over decades, but deciding on the most appropriate way to achieve success, seems not to have been catered for. Some expected outcomes are questionable due to context dependency and the uniqueness of the construction industry. Schon (1992) had considered some of these as the dilemma of abandonment or alienation. According to his review, academic research has not been able to solve practical problems. Because practitioners could keep critical success or failure factors in their minds, but more invention is required on pre-identification of existence, the application of remedies and approaches to address the factors. Therefore it seems that there is yet a requirement to develop a sustainable planning approach for construction project execution. The authors suggest that a human-centered approach may be more beneficial to the construction industry as a complement to previous solutions. Hence, the suitability of a strategy-led approach is being explored in the larger research on which this paper is based.

What is strategy?

There are different definitions of strategy which sometimes tend to confuse rather than clarify (Norton and Irving, 1999). For example Chandler (1962, p 13) defines strategy as ‘the determination of the basic, long-term goals and objectives of an enterprise, and the adoption of course of action and the allocation of resources necessary for those goals’. Thompson, Strickland and Gamble (2007, p3) state that strategy is the ‘management action plan for running the business and conducting operations’. Both definitions provide contrasting views on the time frame for which a strategic plan is developed. While Chandler sees it as a long term issue, Thompson *et al* believe strategy involves both long term and short term planning. The reason is they have viewed the term 'strategy' within two different contexts. Chandler (1962) has focused on business administration. The scope of his study is limited to four goals such as decision to expand the volume of activities, to set up business plants and offices, to

move into new economic functions and become diversified along many lines of business. All the goals are towards long term achievement. However, Thompson, Strickland and Gamble (2007) focus on all the level of management functions including corporate level, business level, functional level and operational level. Therefore, the definition contains both long term and short term achievements.

Some other useful definitions include White (2004, p5) that defined strategy as the 'coordinated series of actions which involve the development of resources to which one has access for the achievement of given purpose'. Also Johnson and Scholes (2002, p 10) define strategy as 'the direction and scope of an organization over the long term which achieves advantage for the organization through its configuration of resources within a changing environment to meet the needs of markets and to fulfil stakeholder expectations'. An early and precise definition of strategy is useful to avoid conflicting its interpretations in any activity (De Wit and Mayer, 2004).

Generally, it can be seen that the definitions depend on the contextual background or perspective from which strategy is viewed. In the current study, strategy is explored within the context of construction project success. Thus strategy is that which will assist a project manager in decision making and problem solving within the complexities, uncertainties and dynamism of construction processes. Then it is essential to discuss the suitable paradigms that create the strategy-led approach.

Strategy, technical rationality (TR) and reflective practice (RP) paradigms

Construction project planning is a balance between logical and generative thinking (Prince and Newson, 2003; De Wit and Mayer, 1999; Mintzberg, Quinn and Ahlstrand 1998). From a rational (logical) perspective, the project manager has perfect knowledge of problems and a clear idea of the alternatives and the kind of solutions wanted. The alternative perspective is that the project manager solves problems in a much more intuitive way; the manager rarely has perfect knowledge and cannot operate entirely rationally (Fryer, 2004). There are other paradoxes within the strategic management literature such as intended vs. emergent strategies, revolutionary vs. transformational strategies, etc. It seems that there is a possibility to categorize these paradoxes under two main paradigms: reflective practice (RP) and technical rationality (TR). Both paradigms approach decision making in two separate ways. The strategy-led approach suggested by the current study assumes a combination of both RP and TR approaches. It is vital to discuss the requirement of using both paradigms for problem solving.

Dias and Blockley (1995) explain that many engineering curricular are dominated by engineering science and mathematics to describe most physical phenomena. They argue that technical rationality (TR) approach is not adequate to handle current complex situations. This is similar to Schon's (1992) conclusions that technical rationality has created a gap between thought and action, theory and practice, the academy and the everyday world. Schon (1992) suggested reflective practice (RP) as a remedy that could fill the gaps created by TR. Dias and Blockley (1995) believe RP provides alternative approaches for professionals which can be developed through professional practice and experiential knowledge. It is useful to add that Winch (2010) recognises RP as a holistic discipline (from inception to completion) for problem solving in the management of construction activities.

A useful distinction between the technical rationality (TR) and reflective practice paradigms is summarised in Table 1. The reflective practitioner has a more holistic view of issues, whereas TR inspires practitioners to provide answers by dividing the

whole into parts (Dias and Blockley, 1995). One may ask: can those separate parts replace the whole? Dias and Blockley provide this explanation: that human's get the ability to talk and walk due to cooperation between the sub-holons of the body such as skeleton and nervous systems. The sub-holons themselves do not have those abilities. Regarding project management, time, cost and quality can be treated as sub-holons of management concerns. The three together could result in successful project delivery. However, if one considers one dimension separately, the project may end up with failures in the other two dimensions.

Table 1: Comparison between RP and TR (Dias and *Blockley, 1995)*

Paradigm	Technical Rationality	Reflective Practice
Characteristics	Selective inattention	
Basis	Science (analytical, reductionist, context independent and practitioner independent	Systems (synthetic, holistic, context dependant and practitioner dependant
Models		
Grounding	Truth	Dependability
Specification	Precision	Appropriateness
Improved by	Calibration against world	Comparison with world
Techniques	Mathematics	Artificial intelligence

Another important fact is that TR provides solutions only to problems which can be described by theoretical phenomena (selective inattention); but most social, political and cultural issues are difficult to describe through science or mathematics. It is important to note that these soft aspects may be the ones that mostly influence project success (Dias and Blockley, 1995). The TR paradigm is context independent and practitioner independent, therefore difficult to think of it as a reliable solution on its own for an industry like construction.

The calculation of the duration of an activity may be taken as an example to clarify the difference between TR and RP paradigms. The first step is to calculate the number of hours. A practitioner has to select appropriate hourly outputs. TR practitioner will most likely select the hourly output from standard rates. However, the reflective practitioner would decide an appropriate hourly output based on experiential data. Material supply, number of workers, consultant's efficiency, quality of work, working space and climate conditions are some important things that may be considered. After deciding on an appropriate hourly output, the calculation of number of hours becomes simple mathematics. Therefore the selection of an appropriate hourly rate seems come under the RP paradigm; while the calculation seems to be under TR paradigm. Both paradigms together create a realistic end result. Complexities, dynamic situations and uncertainties can be handled through reflective practice. Project managers must use both logic and intuition accordingly (Fryer, 2004). It is important to note that the two paradigms are not isolated. Dias and Blockley (1995) depicted several relationships between TR and RP paradigms, where in some decision situations TR becomes the context of RP, while in others RP is a precondition or may be a constraint for TR. Then, what are the approaches needed to practice these paradigms? Seeking the appropriate approaches to root these paradigms is one of the objectives of the current study.

Dias and Blockley (1995) explain that the TR paradigm is mathematic or scientific and that AI is an approach under the RP paradigm. However, as previously highlighted there are big hurdles for AI adoption in the industry regarding to its applicability. It would therefore seem that strategies are the most important single factor for successful project completion (Kumar, 2002). Some authors argue that a strategic approach can only support rational methods (Porter, 1998). Conversely, others suggest that strategic approach can only support generative methods (Ohmae, 1982). More recent studies suggest that that successful strategy making involves the right combination of logic and creativity (De Wit and Mayer, 2003; Prince and Newson, 2003; Mintzberg, 1998). Mintzberg (1998) classifies different perceptions according to school of thoughts (as cited in Prince and Newson, 2003). According to his different perceptions, strategy can root different paradigms. Therefore according to above suggestions, strategy led approach can provide the path not only for RP paradigms, but also for TR paradigm. This is quite an interesting fact to investigate. If both paradigms can be addressed through strategy-led approach, it may become a suitable solution for current project failures. However, there is a gap to fill regarding its suitability through practitioner's opinions. Therefore current study discuss about strategy-led approach as an alternative approach to practice the TR and RP paradigms. In addition to suitability, the contribution and relations between two paradigms will be explored by developing a strategy led approach.

Strategy and the construction industry

Several studies support strategic considerations in the construction industry. Wong and Ng (2010) recommended that the construction industry needed regular performance evaluations and strategic applications to cope with dramatic changes in its economic climate. Betts and Ofori (1992) had stated that tactical considerations need to be complemented by strategic concerns to cope with increasingly dynamic situations that the construction industry operates within. They further mention that at least tactical considerations must be put into the context of strategic concerns. Strategic concerns must be kept in focus throughout the project life cycle for successful project delivery, even though the projects could turn from strategic to tactical when execution progresses (Parson, 1983). It can be seen that the essence of a strategic approach in construction has been admired since decades and highlight the importance of strategies; its dimensions; and paradoxes. However are those enough to develop a strategy-led approach as a successful project delivery method? It seems that those considerations can give only an outline for practitioners about strategic approaches.

Strategic model development is relatively new for the construction industry compared to other industries (Kazaz and Ulubeyli, 2009; Betts and Ofori, 1992). There seems to be little information regarding the strategy process, content and context; and in the form of discussions on kinds of strategies. For example, no one has explored the influence of stakeholders to the strategy making process. The relative simplicity of construction activities could account for the non-adoption of strategic approaches (Ofori, 1990), but what is this simplicity? Technically construction may appear simple, but is it realistic to consider only technical issues? Conversely, management issues have made construction projects much more complex today (Fryer, 2004; Baccarini, 1996; Stoner *et al*., 1995). Therefore there cannot be simplicity when technical considerations are considered together with managerial concerns. To some extent Ofori's (1990) statement implies that project issues are mostly due to managerial issues; not due to technical issues.

Further it is observed that there are conflicts between academia and practitioners about strategic approaches. For example, when a British professor showed one of Porter's models to a senior manager in a major construction firm, the professor was dismissed by the manager saying 'get out of here; I have a construction company to run' (Betts and Ofori, 1992). Why do these kinds of conflicts exist? It is worthy to review Porter's model to identify the reasons.

Porter's model is presented in figure 1 which mainly describes the competitive advantage that strategies could offer. It explains how a producer can win the market by addressing high quality products or low-cost products. This seems to be appropriate with marketing. How relevant is this to the construction industry? To win a project, contractors may have to provide a low bid; then the challenge is to keep the quality according to specifications while also making reasonable profit. Construction projects are a balance between cost and quality. Porter's model is biased to either quality or cost, and therefore applying the notion of competitive advantage for construction companies is debatable. Economies of scales are not very relevant to the construction industry (Betts and Ofori, 1992). Therefore applying strategic concepts from a marketing or production perspective may not suit the construction industry. Therefore there is a requirement to fill the gaps of knowledge on strategies in the construction sector. Porter focused on company level strategies (corporate strategies) but, project level strategies seem to be more appropriate in construction because construction projects are different from one another (Wong and Ng, 2010; Fryer, 2004; Ballard and Howell, 1998).

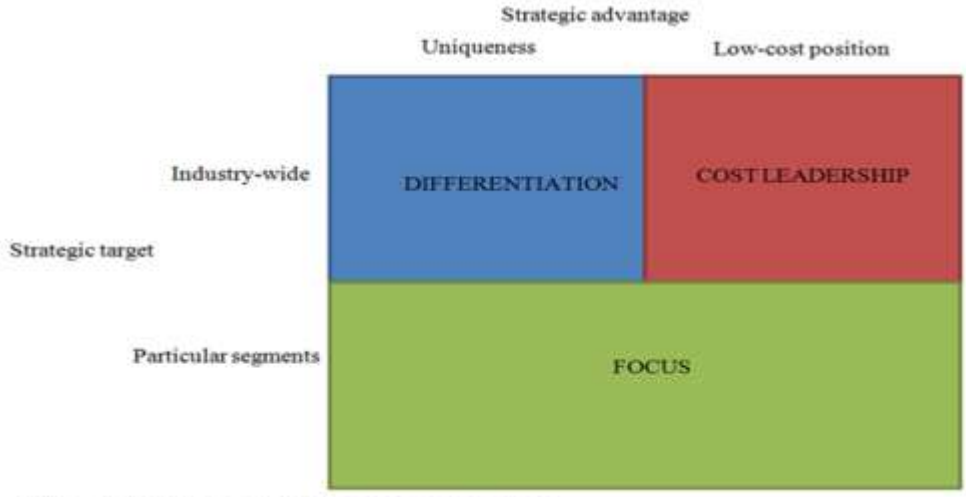

Figure 1 – Porter's model for strategy formation (1985)

Strategy is a trial (Thompson *et al*., 2007); in other words strategy has an uncertainty itself. Then can construction firms do trials at their company levels? Construction projects run for longer, therefore to get feedbacks on company level strategies may take longer when compared to production and marketing activities. Performance feedbacks are more appropriately obtained from site activities. Because of low risks and quick results, the activity level offers the most appropriate position for trial and adjustment. This could account for the rejection of Porter's strategic model by that construction practitioner. The study focuses on developing a strategy-led approach at the project level which could in turn influence company level strategies. It recognises that a two way influence exists between upper and lower levels in the strategy hierarchy (Thompson, Strickland and Gamble, 2007). The larger research programme

on which this paper is based is presented in the next sections to put the strategy concept in perspective.

Design of the research

As previously mentioned, the current study is a part of a larger research (doctoral) programme that determines the applicability of a strategy-led approach to planning for successful construction project delivery. Key information in this larger study are outlined in the following paragraphs.

Aim and objectives

The doctoral research study aims at developing a strategy-led approach as a tool for successful construction project planning and execution by project managers. The study will investigate current project management practices for their drawbacks in project delivery and then seek to proffer strategic approaches as the best practice in construction project management. To achieve this, the following research questions will determine the framework for the study.

- What are project managers' roles in construction project planning and delivery?
- What are successful project delivery strategies that project managers' could use to deliver construction projects?
- Which of reflective practice and technical rationality approaches could ensure success on construction projects?
- Could a strategy-led approach be developed for successful project planning and execution?

The above research questions helped to generate some research objectives. The objectives that will be pursued by the doctoral study include:

1. To identify what constitutes success and failure on construction projects and the contributory role of the Project manager in achieving either outcome (success or failure). Information on the role of the project manager in project outcomes will be gathered through research reports, interviews and a questionnaire survey
2. To investigate the drawbacks in current practices in construction project delivery. This objective is undertaken with a view to ascertaining the potential for alternative solutions to planning and execution of projects.
3. To propose a strategy-led approach for adoption by project managers in the form of best practice for delivering successful construction projects.

CONCLUSIONS

Project success/failure has been an issue for the construction industry since decades. Several literatures identified shortcomings to current practices and have made suggestions for improvements. However construction project failures are still common in the industry. The paper has as its objective to describe an ongoing doctoral research which seeks a more strategic approach to successful construction project delivery. It was suggested throughout the paper that sustainable planning approaches must be a balance between logical thinking and generative thinking; and between the technical rationality and reflective practice paradigms. This will also be pursued throughout the doctoral study programme. The authors believe that a strategy-led approach could become a suitable method to root different construction success paradigms. This alternative planning approach will provide an opportunity for construction professionals to use their education, experience and qualities in project delivery.

Strategy is seen as that which could assist the project manager in decision making and problem solving within the complexities, uncertainties and dynamism of construction processes.

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