DEVELOPMENT OF A NEW BEST PRACTICE MODEL FOR BUILDING PROJECTS

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Time, cost and quality are the traditional determinants of project success. The level of client satisfaction is a newly defined measurement of project success. Often the satisfaction level of construction clients is not high.

The reasons for this situation are twofold, firstly due to the temporary organizational structure of construction team and secondly, the inefficient construction process. The traditional procurement route, whilst still the most popular in the building sector, is probably subject to most criticism.

The primary aim of this research is to develop a new best practice model for building projects. This will enable the client's project manager to identify best practice under the traditional procurement route before the work is executed. Within this model, the sequence of construction activities, the responsibilities of the parties and the critical aspect of each phase of the project are identified. This model can then be utilized at both the design and/ or the construction stage in order to secure project success.

Keywords: buildings, best practice, traditional procurement.

INTRODUCTION

The traditional definition of project success is that it achieves satisfactory performance in time, cost and quality. The newly raised measurement of project success is the level of achievement of the objectives of the project parties (Belassi and Tukel 1996).

De Wit (1988: 165) stated the 'project is considered as an overall success if the project meets the technical performance specification and/ or mission to be performed, and if there is high level of satisfaction concerning the project outcome among the key people in the parent organizations, key people in the project team and key users or clientele of the project effort'.

The final decision-maker on whether the project is a success is the client (Boyd and Kerr 1998). The importance of the client has been identified in a number of reviews and reports. Some relevant quotations are given below:

- Flanagan (1981: 29) stated 'the important party within the construction industry is the client. Building is about getting it right for the client because he is the only man who matters at the end of the day'.
- Latham (1994: 3) has mentioned 'clients are the core of the process and their needs must be met by the industry'.
- Boyd and Kerr (1998: 88) stated 'the recent doctrine of being 'client-focused' has elevated the role of the client in the property and construction industry to a God-like position'.

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It can be concluded that 'client satisfaction is the most important criteria for project success'.

Numerous researchers have mentioned that value for money is the ultimate destination of client satisfaction. The concept of value for money is defined as 'the relationship between cost and quality' (Kim 1998). In other words, the determinant of success is unchanged.

NECESSITY FOR INCREASING THE LEVEL OF PROJECT SUCCESS

Poor performance in time, cost and quality

The performance of the construction industry in relation to time, cost and quality has been criticized as inadequate for many decades. According to the findings of the Construction Client Forum's survey on UK construction clients, the performance of the construction industry is not satisfactory. This survey found that fifty-eight percent of respondents having experienced programme overruns on their projects with the length of delay averaging forty-eight days from the anticipated completion to the actual finishing date. Delays were also experienced at the front-end of the project with construction work starting on average fifty-three days behind schedule (Ridout 1999).

On the budget front, clients were also critical of the industry's ability to keep to the agreed contract budget, with thirty-two percent of projects exceeding the agreed sum (Ridout 1999).

When defining 'quality', there were many aspects to be considered as measures of quality. Absence of defects can be seen as one of the determinations of quality. Six percent of clients experienced major defects that affected handover substantially, twenty-four percents identified one or two defects that caused slight delay and fifty-seven percent experience a few defects. The average delay to respondents who reported one or two defects was four weeks, while those who suffered from major defects had their handover date pushed back by nearly eleven weeks (Ridout 1999).

Low satisfaction level of construction client

Construction clients are often not satisfied with their projects and this situation has existed for more nearly two decades. Mackenzie, managing director of Slough Estates stated that 'I believe that the industry's objective is to satisfy my needs but it is failing to do so' (Mackenzie 1979: 22). His criticism focused on the aspect that the building industry failed to deliver the goods on time, and at a reasonably price (Mackenzie 1979: 22). Latham (1994: 11) also stated 'the clients do not always get what they ask for and the level of client satisfaction in the construction industry is lower than the motor industry'. Improving performance to satisfy clients is still the focus of a number of post-Latham reports (e.g. Construction Clients Forum 1998, Construction Industry Board 1996, 1997, Egan 1998). Egan (1998: 2) also expressed his 'deep concern that the industry as a whole is under-achieving' and 'the need to improve in construction is clear' Egan (1998: 8).

REASONS FOR UNDER-ACHIEVEMENT OF CONSTRUCTION PROJECTS

Temporary multi-organization of the construction team
The working relationship of the construction team is often temporary. The background of the construction parties is different and they have different specialist skills. It is critical therefore treat the parties understand and appreciate the interdependence and responsibilities of each other.

However, in reality the working situation is not so perfect. There have been various studies, the most notably Higgin and Jessop (1965) mentioned that 'the relationship between the construction parties was problematic, divisive and litigious'.

The construction participants often find it difficult to rationalize the whole procedure and understand the responsibilities of other parties (Low 1998). The British Property Federation survey in 1997 further supported this argument; the same survey also pointed out that more than a third of major clients are dissatisfied with the performance of contractors and consultants (Egan 1998).

Inefficient construction process
The second reason is the inefficient construction process (Low 1998, Tucker and Ambrose 1998). The traditional procurement strategy is the still the most popular procurement method (Royal Institution of Chartered Surveyors 1994 and 1996). At the same time, it is also the procurement method that is subject to the most criticism (Tucker and Ambrose 1998).

The nature of the traditional procurement method further enhances the problem within the construction team. In the traditional procurement method, the design and construction responsibilities are separated. The contractor is the party responsible for the construction but they do not have responsibility or liability in the design process. This separation of the design and construction process tends to foster a 'them and us' attitude between the designers and contractors. This reduces the team spirit that is vital to the satisfactory conclusion of a building project.

AIMS OF THE RESEARCH

The aim of this project is to develop a model based on best practice, for use by the client's project manager. This can then be used to predict the likelihood of success on the building project. This model is focused on the traditional procurement strategy as it is the most popular procurement strategy but at the same time subject to most criticism.

The sub-aims of the project will be to develop a framework which clearly identifies the roles and responsibilities of the major parties on the building team and identifies the issues within the project cycle which can prove critical to project success viz. completion within time, cost, quality and safety.

DISCUSSION OF THE NEW BEST PRACTICE MODEL FOR BUILDING PROJECTS

Reason for choosing the criteria

The criteria in this model include time, cost, quality and safety. The first three criteria are the traditional determinants of project success. Safety is an additional factor which should be included.

The construction industry is one of the most dangerous industries in the nation and the combined injury and illness rate in this industry is higher than for all other industries except for agriculture. Construction accidents can cause both loss of human life and loss of money to the parties (Sawacha *et al.* 1999).

Apart from these criteria, certain 'hotspots' are also identified within the each stage of project cycle. The 'hotspots' are the 'critical activities', to which each participant should pay special attention in order to ensure satisfactory performance before proceeding to the next stage. The 'hotspots' were identified following an extensive literature search and feedback from practitioners.

Parties responsible for construction activities

The participants, at the pre-contract stage, include the architect, quantity surveyor, client and the planning supervisor. In the traditional procurement strategy contractors will not participate in the project until the estimating stage.

The Planning Supervisor is a relatively new role in the construction process that was introduced following the implementation of the Construction (Design Management) CDM Regulation in 1994. They have overall responsibility for co-ordinating the health and safety aspects of the design and planning phase and for the early stages of the health and safety plan and the health and safety file (Health and Safety Executive 1994).

Methodology for developing the framework

The standard cycle of work in a building project identified in the RIBA Architect's Job Book (1995) and known as 'the RIBA Plan of Work' has been chosen as a skeleton framework. The information on the RIBA Plan of Work made up only one third to one half of the activities in this new best practice model. The changes within construction industry has been greater in the last five years than the past fifty years, therefore, new construction management issues should also be included. The other activities are abstracted from the information in various documents and they are listed below:

- The RIBA Plan of Work identified within the Architect's Job Book (Royal Institute of British Architects 1995)
- Responsibilities of the quantity surveyor identified by the RICS (Royal Institution of Chartered Surveyors 1983)
- Responsibilities of the contractor in the traditional procurement method (Chartered Institute of Building 1996, National Joint Consultative Committee 1989)
- Procedure for single-stage tendering identified by the NJCC (National Joint Consultative Committee 1989)
- Responsibilities of the client identified by the Construction Clients Forum (1998)

- Current government publications concerned with improving performance of the construction industry (Construction Industry Board 1996 and 1997, HM Treasury 1993, 1994, 1996 and 1998)
- Official advice on health and safety within the construction industry (Health and Safety Commission 1995a and 1995b, Health and Safety Executive 1994)
- Design management concept for construction (Gray *et al.* 1994)
- Environmental management concept for construction (Griffith 1997)
- Constructability concept (Construction Industry Institute 1986)

Apart from reviewing literature, comments from practitioners are also included. The framework of the best practice model has been sent to the representatives from the UK Housing Associations. The reason for the choosing Housing Associations is because they are clients with experience of the traditional procurement route. Before the framework was sent out, a letter requesting co-operation was sent out first. The purpose of sending this letter was to identify which procurement method they used. Only the Housing Associations which used the traditional procurement were chosen. Finally, twenty sets of questionnaires were distributed, twelve were returned but only ten sets are usable.

The updated model incorporates the following modern construction management issues:

Risk management
The construction industry is subject to high risk. Risk can be managed, minimized, shared, transferred or accepted, but it cannot be ignored (Latham, 1994). Therefore, an appropriate risk management method must be chosen, otherwise, risk may 'adversely affect the project sponsor's ability to achieve the project objectives' (HM Treasury, 1993: 1).

Value management
The primary objective of value management is same as the basic expectation of the client, i.e. to achieve value for money.

Total quality management (TQM)
The fundamental goals of TQM are customer satisfaction and continuous improvement.

Safety management
Safety is a rising issue in recent years because the construction industry is one of the most dangerous industries in the nation. Therefore, this concept should be considered in the model.

Design management
The primary aim of a construction project is to produce a high quality building. Therefore, appropriate management of the design process is an essential element.

Environmental management
The construction industry is one of the industries which causes tremendous effects on environment. The best method in order to minimize the effect is to implement control systems in the construction process.

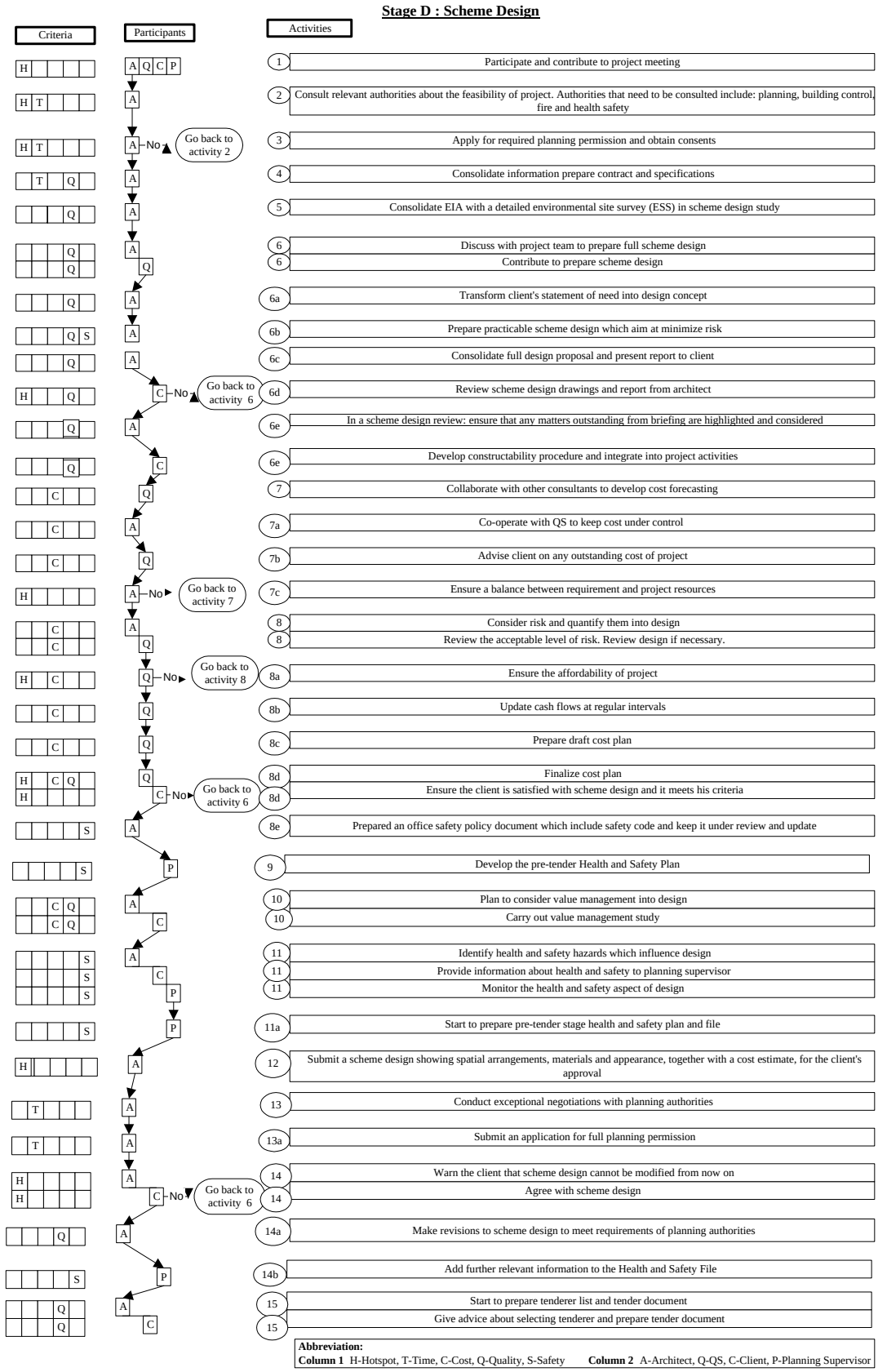

Figure 1: Framework for scheme design stage

Partnering
Partnering is ‘a strategic alliance’ that delivers vast improvement in the construction performance. The implementation of this method can improve the working relationship of the construction team.

Benchmarking
Benchmarking is a process of continuous improvement and the search for industry best practice that leads to superior performance. It should be incorporated as it is the procedure for finding the best practice in industry.

Constructability
Constructability is the optimum use of construction knowledge and experience in planning, design, procurement and field operations to achieve overall project objectives. Maximum benefits occur when people with construction knowledge and experience become involved at the very beginning of a project (Construction Industry Institute 1986).

FRAMEWORK OF BEST PRACTICE MODEL FOR BUILDING PROJECTS

Framework for scheme design stage

For the purposes of this paper, the pre-contract Stage D “Scheme Design” has been chosen for demonstration. The reason for choosing this stage is because it is one of the most critical stages in the project cycle as it is the transition stage from briefing to working drawings. As it is within the pre-contract stage, there is no role for the contractor in this stage. Figure 1 shows the framework for identifying best practice in the pre-contract “Scheme Design” phase.

Description of diagram

The diagram is divided into three columns. The first column states the *criteria*.

The second column identifies the *participants* in the construction process. The arrows show the sequence of work. If the activities reach the ‘hotspot’ and there is no agreement at that point, the participants should go back and re-start the procedure again. In some activities, only one party needs to participate.

The third column shows the *activities* of the construction process, the numbers indicate the sequence of work. The information in this column is abstracted from various sources of literature that has been listed out in the previous section.

The activities that are listed encompass the typical issues in the traditional procurement strategy, but also reflect the modern construction management issues. The issues will be reflected in the whole construction cycle, but they may not all be reflected in this particular stage.

CONCLUSION

The reasons for the under-achievement of construction projects are two-fold: temporary multi-organization of construction team and inefficient construction process. These two reasons are inter-related and they enhance the severity of problem.

There is a necessity to develop a best practice model, which clearly identities the construction activities and the responsibility of the participants in a diagram. The

activities stated should include modern construction management issues, e.g. risk management, value management, total quality management, safety management, risk management, environmental management, benchmarking, partnering and constructability.

Apart from stating the activities and role of participants, this model should also incorporate the criteria and the 'hotspots'. The criteria include not only the traditional successful determinants: time, cost and quality, but also safety. The 'hotspot' is the critical activity at which the construction parties need to pay special attention.

FURTHER RESEARCH

This paper has embraced the literature study and the practitioners' preliminary comments on the activities within the construction process and the roles of the participants.

The next stage is to perform the major survey. The methodology for carry out the major survey is to interview practitioners within representative institution; the institutions include RIBA, RICS, CIOB, CCF and HSE. The purpose of the interview is to confirm or modify the model.

A hierarchical mathematical model will then be created. The preliminary design of the model should have four levels: the top level is the overall success of the construction, second is the success within individual construction stages (i.e. from inception to feedback), third is the success under the individual criteria of time, cost, quality and safety, fourth is the sequence of activities within each individual stage. The method chosen for analysis should be analytical hierarchy process (AHP). This method has been chosen to enable the user to rank the important criteria by the use of a weighting system.

Finally, a computerized expert system will be developed. The user can use this model as a best practice in order to achieve project success throughout the new project.

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