



Measuring the effect of project management on construction outputs: a new approach

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Abstract

The precise nature of the influence that project management has upon building project performance in terms of time, cost and quality outputs is not well defined. In this paper we present a new approach to the measurement of the effect of Building Project Management (BPM) on these key outputs using 15 'cases' derived from UK data. Within the UK construction industry there is doubt as to the added value of BPM. We argue that it is essential that an objective analysis of the value added potential of BPM is undertaken with a view to demonstrating whether BPM in the UK does or does not improve the efficiency of the construction process and thereby add value to the output. The modelling strategy adopted attempts to achieve this. The evaluation undertaken in this paper demonstrates that BPM as it is presently implemented in the UK fails to perform as expected in relation to the three predominant performance evaluation criteria; time, cost and quality. If these criteria are considered to be joint products, the results presented suggest that BPM does not represent added value for UK construction clients. © 2000 Elsevier Science Ltd and IPMA. All rights reserved.

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1. Introduction

Building project management (BPM) has two principal purposes; first, to identify the most appropriate project objectives, typically expressed in relation to time, cost and quality, having taken due cognisance of the project's intended purpose, its client and its environment[1]. Second, project management must establish an organisational structure which allows a project to be managed by its agreed objectives with respect to its technology, its contributors and the environment in which it takes place[1–3]. This must allow for the integration of a large number of contributors who must be made aware that the delivery of the project's core

objectives is their common goal. However, in the case of the UK construction industry, it is apparent that the use of consultant project managers specifically to secure successful project delivery is questionable. This paper is concerned with evaluating the effectiveness of the project management discipline in delivering successful project outputs where successful outcomes are measured in terms of time, cost and quality. The structure of the paper is as follows: first we provide a brief discussion of what the *purpose* of BPM is meant to be.

Subsequently, we present a theoretical framework to evaluate the effectiveness of building project management in terms meaningful to clients, and operationalise this by developing a path model using 15 case studies from the UK. Finally we offer a number of conclusions focusing on the requirements for future research in this area.

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2. BPM and project performance

BPM may now be considered to be a relatively mature discipline. There is an extensive body of knowledge concerning project management practice and implementation. Nevertheless, the precise influence of BPM upon the performance outcomes of building projects remains unclear. It is generally recognised that BPM exists as a discipline primarily for the benefit of the building client. Therefore, it may be argued that the success or failure of projects in connection with the application of project management practices is most appropriately measured using the criteria which are of most importance to the client.

Thus the criteria, time, cost and quality assume a particular significance. There are some objections to the analysis of time, cost and quality performance as the sole basis for the measurement of project success, and it is evident that a degree of concern exists regarding the emphasis placed upon the contemporary project manager in relation to the accomplishment of targets[2].

Such objections are balanced by an increasing demand from building clients for improved project performance *specifically* in relation to the delivery of time, cost and quality objectives. Forums such as the Construction Productivity Network have allowed large clients to express demands concerning what they require from the building industry. In the case of leading clients the demand is for building project delivery to be 100% predictable[4]. Their aim is to procure a high quality product at a low cost which will be reliable and which will be delivered on the date that it is required[4]. It is clear then that time, cost and quality assume principal importance.

3. The importance of measuring the influence of project management

The UK construction industry is now characterised by poor performance. In relation to other industries the construction industry is uncompetitive[5]. The increased awareness of the present position has been driven in part by the Latham review published in 1994 [6] and by the report of the construction industry task-force undertaken by Sir John Egan at the request of the Department of Trade and the Regions (DETR)[7]. Additionally, client led research groups such as the *Construction Productivity Network* (CPN) and the *Agile Construction Group* further emphasise the uncompetitive nature of the industry. Recent years have seen a number of initiatives and manufacturing practices publicised within the industry. Such initiatives include '*lean production*' or '*agile construction*' and '*supply chain management*'. Whilst commendable, these

initiatives in the main, attempt to shift the emphasis away from project management per se and it is apparent that the project manager is viewed as simply another consultant in a complicated supply chain.

However, the focus of these initiatives, particularly those of *lean* and *agile construction* and *supply chain management* are inescapably project management functions. Thus, the pure role of the project manager, in terms of the *management of projects*, is seemingly marginalised and alternative parties (such as principal contractors) are approached with the aim of securing for clients the core objectives of the modern project management discipline. Yet clients continue to invest funds in BPM via the appointment of Consultant Project Managers to oversee their capital building projects. Therefore, an appropriate evaluation of the influence of BPM upon project deliverables is timely and important.

4. An approach to measuring the efficiency of BPM

A rigorous evaluation framework which has the objective of determining the precise influence of BPM upon building project performance must have the ability to compare projects having implemented BPM with those not having done so. This can be achieved using conventional economic analysis tools. Time, cost and quality can be considered to be real outputs. Quality relates to the physical building asset and this is generally considered to be the exclusive output of the building process, however, the interdependency which exists between the three criteria, juxtaposed with the prevailing attitude of the contemporary building client, mean that the criteria time, cost and quality can be argued to be joint products. Considering them as such, the following may be stated:

$$\{T, C, Q\} = f(\text{PM}) \quad (1)$$

but;

$$\{T, C, Q\} = J \quad (2)$$

therefore,

$$\{J\} = f(\text{PM}) \quad (3)$$

To differentiate between BPM projects and non-BPM projects, let: $J1$ = Joint products of a PM project; $J0$ = Joint products of a non-PM project; $PM1$ = PM project; and, $PM0$ = Non-PM project.

A PM project is considered to be one using consultants to discharge the project management function, and a non-PM project is considered to be one which does not.

In theory, by designing and implementing an organisational structure and an integration system which is

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