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Framing of project critical success factors by a systems model

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Abstract

Perhaps the best known approach for tackling the human and organisational aspects of projects is through the use of 'critical success factors' but although the approach has very many champions it is not without its critics. This paper sets out the findings of a major review of the sets of factors that are available and outlines the main reservations that have been expressed about the approach. It then shows how a systems model, the Formal Systems Model, can be used as a framing device to deliver the benefits of taking account of 'critical success factors' whilst at the same time avoiding the problems associated with 'critical success factors' that give rise to the criticisms.

Two IS projects are used to demonstrate use of this framing devise. When observation began at the start of the projects they looked very similar and equally likely to succeed. In the event, one of the projects was largely successful across the whole of the range of measures normally used to judge success whilst the other exhibited most of the characteristics of failure. Analysis using the framing device is well able to demonstrate the marked differences in the ways the two projects were managed and to account for stark contrast in the levels of success achieved. The paper concludes that the Formal System Model allows the underlying benefits of 'critical success factors' to be secured whilst overcoming most of the problems associated with a checklist approach.

Keywords: Critical success factors; Formal system model; Human and organisational aspects of projects

1. Introduction

The concept of success factors is usually credited to Daniel [1] who introduced it in relation to the 'management information crisis' that was being brought about 'by too rapid organizational change'. In his seminal paper on the topic Rockart [2] unpacked the term 'critical success factors' (CSFs) thus:

> ...the limited number of areas in which results, if they are satisfactory, will ensure successful competitive performance for the organization ...
> ... the few key areas where 'things must go right' for the business to flourish.
> ... areas of activity that should receive constant and careful attention from management.
> ... the areas in which good performance is necessary to ensure attainment of [organizational] goals.

Rockart gave his examples of critical success factors at industry and organization level from the perspective of the Chief Executive but sets of factors have now been developed at very many different levels and across a huge range of undertakings and activities. Where project management is concerned, the search for CSFs began in the 1960s. Since then very many authors have published lists of factors, sometimes relating them to specific problem domains and types of activity, sometimes stressing their applicability to all types of projects and sometimes turning the notion on its head and referring instead to critical failure factors. There have also been a significant number of studies comparing sets

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of factors and either trying to identify the definitive list or pointing out the need to match the list used to the project being undertaken. In recent times, the flow of research publications identifying new sets of factors has slowed but reference to and use of the concept has not diminished.

2. Comparison of sets of factors

This section is based upon a review of 63 publications that focus on CSFs. Between them they draw on a variety of data sources and encompass theoretical studies and empirical studies of successful and unsuccessful projects. The CSFs cited across the 63 publications are listed in Table 1 in decreasing order of frequency of occurrence. It should be noted that in a number of papers, factor definitions were unclear. For example the factors 'board sponsorship support' [3] and 'upper management buy-in' [4] have been categorised here under the heading 'support from senior management' but it is accepted that they could also have been categorised under the heading of 'project sponsor/champion'.

The table shows there is only limited agreement among authors on the factors that influence project success. The three most cited factors are: the importance of a project receiving support from senior management; having clear and realistic objectives; and producing an efficient plan. However, although 81% of the publications include at least one of these three factors, only 17% cite all three. This lack of concurrence has also been identified by Wateridge [46] who states that 'there does not appear to be a consensus of opinion among researchers and authors on the factors that influence project success'.

Another of the many interesting things that emerge from the comparison between publications is that although the importance of having a committed project sponsor or an executive to support or 'champion' the project was only cited in 19% of the publications examined, a study undertaken by Poon and Wagner [35] ranked this factor as the most critical. Similarly the studies undertaken by Cash and Fox [14], Martinez [18] and Jang and Lee [29] rank this factor among the three most critical and Larsen and Myers [66] in their case study evaluating a package-driven process re-engineering project found that a number of the managers they interviewed attributed initial project success to the commitment of the project's sponsor.

3. Criticisms of the critical success factor approach

In addition to the lack of agreement between authors that has been demonstrated above, two criticisms of the CSF approach emerge from the literature. The first is that the inter-relationships between factors are at least as important as the individual factors but the CSF approach does not provide a mechanism for taking account of these inter-relationships. As Nandhakumar [67] points out, 'a better understanding of the relationship between key success factors and the EIS development is required if success factors are to be of any guidance to the practitioners to develop effective information systems'. Belassi and Tukel [24] provide an example of the problem.

For instance, top management support is a factor related to an organization which can be affected by the general state of the economy. Similarly, the uniqueness of the project activities can affect the project manager's competence on the job. Lack of top management support together with the project manager's lack of competence on the job might lead to project failure.

Larsen and Myers [66] draw attention to the second criticism: 'the factor approach tends to view implementation as a static process instead of a dynamic phenomenon, and ignores the potential for a factor to have varying levels of importance at different stages of the implementation process'.

The next section of this paper will propose a way of overcoming these difficulties whilst allowing almost all CSFs that have been identified as a result of a substantial review of the literature to be taken into account.

4. The Formal System Model

Fig. 1 shows a model of a robust system that is capable of purposeful activity without failure. This model, known as the Formal System Model (FSM), was developed as part of their failures method by Bignell and Fortune [68]. It unites most core systems concepts and was adapted from Checkland [69], who in turn drew on the ideas of Churchman (particularly his concept of a teleological system) [70] and Jenkins [71].

The formal system at the heart of the model comprises a decision-making subsystem, a performance-monitoring subsystem and a set of subsystems and elements which carry out the tasks of the system and thus effect its transformations by converting inputs into outputs. The decision-making subsystem manages the system. It is responsible for decisions about how the purposes of the system are to be achieved such as which transformations are to be carried out and by what means and for providing the resources to enable this to happen. It makes known its expectations to the subsystems and components that carry out the system's transformations and to the performance monitoring subsystem. It is therefore the decision-making subsystem