



The relationship between total quality management and the focus of project management practices

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Abstract

Purpose – The purpose of the paper is to explore the influence of a total quality management (TQM) programme on the level of focus in project management practices.

Design/methodology/approach – Prior literature was used to develop a construct indicating the degree of focus on customers, time/cost/quality (iron/golden triangle) and other stakeholders. A questionnaire was mailed to a random selection of UK organizations to obtain data on the degree of focus and on whether a TQM programme existed.

Findings – The results from an analysis of completed questionnaires show that those in organizations with a TQM programme in place are more customer-focused in their project management practices than those in organizations with no TQM programme. No such relationship was found between the level of iron/golden triangle and other stakeholder focus and a TQM programme.

Research limitations/implications – Given the exploratory nature of the research reported in this paper there is the opportunity for further work on larger populations to confirm the generalizability of the findings. Also, this research has highlighted an association between the level of focus of project management practice and the existence of a TQM programme, and this requires further investigation in terms of confirming suggested cause and effect relationships.

Practical implications – The existence of a link between a TQM programme and customer-focused project management practice provides a potential route for those looking to improve project performance through placing a greater emphasis on satisfying the customer. The absence of a link between TQM and a focus on other stakeholders suggest that the elements of TQM that facilitate an increase in customer-focus are not able to overcome the barriers to high levels of stakeholder-focus on project management practice.

Originality/value – The exploratory research in this paper focuses on the link between TQM and an area of operational practices, namely, project management-related, that has received limited attention in prior studies.

Keywords Total quality management, Project management, Project evaluation

Paper type Research paper



Introduction

One focus of project management research has been on establishing the attributes of effective project performance, i.e. the success criteria (Cooke-Davies, 2002) and the factors that facilitate effective project performance, i.e. the critical success factors (CSFs) (Daniel, 1961; Rockart, 1979). Traditionally, project performance had been defined in terms of the “iron/golden” triangle (Atkinson, 1999; Gardiner and Stewart, 2000), which refers to meeting cost, time and quality (technical)-related criteria. The

iron/golden triangle is still regarded as applicable for measuring project performance, as shown by a recent survey of project managers (White and Fortune, 2002). Project management researchers have explored the factors that influence the emphasis given to the cost, time and quality-related criteria that make up the iron/golden triangle (see Might and Fischer, 1985; Kerzner, 1989; Pinto and Slevin, 1987; Pinto and Prescott, 1990). However, the predominant approach of these studies has tended to be hypothetical, asking the question how project performance criteria ought to be emphasized rather than establishing the factors influencing actual project management (PM) practice (Shenhar *et al.*, 2001). There is a need to investigate influences on the iron/golden triangle that focus on asking the question “what is influencing performance-related decisions in projects?” and the study reported in this paper goes some way to meeting this need by focusing on actual practice in relation to the performance criteria emphasized in project environments

In operations management research there have been studies exploring the links between operational practices and dimensions of organizational performance. Fullerton *et al.* (2003) reported the impact of just-in-time practices on performance and McKone *et al.* (2001) considered the effect on performance of introducing a total productive maintenance approach. There has been limited research specifically focused on project environments, though a study by Tukel and Rom (2001) investigated the link between having ISO 9000 certification and the level of customer-focus in PM practice (finding no link). One area that has received attention in studies is the influence of total quality management (TQM) practices on performance (Hendricks and Singhal, 2001; Kaynak, 2003). The assumption is that there will be a positive effect on performance through the changes brought about from implementing a TQM-type programme, in such areas as leadership, human resource management, process management, supply chain management and information management (Shieh and Wu, 2002). One study has considered the impact of TQM on project performance, though the study by Shieh and Wu (2002) was limited to appraising the effect on the processes in the architectural planning stage of construction projects rather than on achievement of the end objectives across a variety of projects. There is a need for further systematic research into the relationship between TQM and project performance to see if the introduction of a TQM approach leads to changes in actual project management practices relating to managing performance. To meet this need in the context of the traditional iron/golden triangle measure of project performance the following hypothesis was developed:

- H1.* Respondents working in companies with a recognized TQM programme are more likely to be time, cost or quality (technical)-focused in their practices for managing a project than respondents in companies with no recognized TQM programme.

Although the iron/golden triangle is still a valid measure of project performance it focuses on a narrow range of criteria that are managed during a project's life. In addition, the iron/golden triangle views project performance from a tactical perspective, detached from the high-level, longer-term strategic imperatives that exist in organizations. The deficiencies of a narrow perspective were recognized in the performance measurement domain (Bourne *et al.*, 2000). In operations the limitation of traditional performance measurement frameworks that focused on a narrow range of

mainly financial-based measures, such as return on investment included a failure to focus on continuous improvement and the sub-optimization of performance (Ghalayini and Noble, 1996). As result of theoretical developments, principally as a result of Kaplan and Norton's work on The Balanced Scorecard (BSC) (Kaplan and Norton, 1992, 1996), many organizations developed frameworks that consider a range of attributes.

The theoretical developments in the area of performance management have informed changes in understanding of the attributes of effective project performance. The need to move frameworks for measuring project performance beyond the iron/golden triangle to take into account other attributes led to a distinction being made between "project management" success and "project" success (De Wit, 1988). Project management success encompasses meeting the iron/golden triangle time, cost and quality (technical) objectives and also the way in which the project is managed, i.e. the quality of the process. Project success is broader in its perspective and includes the effect of the final product or service on the customer (Baccarini, 1999). Adopting a holistic view, optimization of performance encompasses both project management and project related measures. As well as the iron/golden triangle and internal process, projects will provide some benefit for the customer (Tukel and Rom, 2001) and hence effective project performance will be customer-focused.

The concept of customer-focus is a fundamental principle of TQM (BSI, 2000). A link between TQM, customer-focus, and organizational performance has been made in relation to the management of operations (Terziovski and Samson, 1999). In this study of manufacturers in Australia and New Zealand, Terziovski and Samson (1999) concluded that elements of TQM, such as customer-focus, related positively to organizational performance in the areas of customer satisfaction, employee morale, delivery, productivity, cash flow, and sales growth. The aim of customer-focused project management, as articulated by Egan (1998), is predicated upon a similar link existing between TQM, customer-focus, and project performance. However, a consistent message through the debate about the need for change has been the recognition that project-focused industries, such as construction, were not as customer-focused as some other industries, as shown by a specific aim set out by Egan (1998, p. 40), who stated in his report that within five years of his study, the construction industry should "deliver its products to its customers in the same way as the best customer-led manufacturing and service industries". As a means of understanding the antecedents to customer-focused PM, it would be useful to investigate whether the link between TQM and customer-focused practices, observed in manufacturing environments, exists in project environments. This leads to the second hypothesis:

- H2.* Respondents working in companies with a recognized TQM programme are more likely to be customer-focused in their practices for managing a project than respondents in companies with no recognized TQM programme.

In terms of maximizing project performance the literature has also recognized the theoretical importance of considering the interests of other stakeholders, besides the customer, (Cleland, 1986; Karlsen, 2002; Mallak *et al.*, 1991; Tuman, 1993). A multi-dimensional performance management framework will include measures that take an external-oriented and social perspective, in particular focusing on the satisfaction of key stakeholders, such as local communities and the environment

(Mallak *et al.*, 1991) and measures that consider the psychosocial perspective of internal stakeholders, such as team members (Boehm and Ross, 1989; Bryde, 2003). The US-based Project Management Institute, in their latest body of knowledge, state that project management is concerned with “adapting the specifications, plans, and approach to the different concerns and expectations of the various stakeholders” (Project Management Institute, 2004, p. 8). However, evidence exists showing that the practical implementation of the stakeholder-focus concept is difficult to achieve in project environments. Boehm and Ross (1989) gives examples of situations in which a failure to meet the needs of various stakeholders to the project, including the team, leads to poor performance. Maylor (2001), in a review of the current state of the project management discipline, states that the processes for managing stakeholders are poorly understood. A theoretical contribution of a TQM-type approach, in terms of overcoming the obstacles to developing a high degree of stakeholder-focus has been put forward (BSI, 2003) yet there has been little systematic research into whether there is a link between the implementation of TQM and stakeholder-focused PM practices. This link is explored through the final hypothesis:

- H3.* Respondents working in companies with a recognized TQM programme are more likely to be focused on stakeholders other than the customer in their practices for managing a project than respondents in companies with no recognized TQM programme.

Research method

Prior work has shown the usefulness of collecting quantitative data via surveys for exploratory research of perceptions, attitudes and behaviour (Sotgiu and Ancarani, 2004; Craig and Johnson, 2006; Konidari and Abernot, 2006); and given the focus of the study reported in this paper is on exploring behaviours in relation to project management practices, a questionnaire was regarded as a valid measuring instrument.

To obtain contemporaneous data, the first part of the questionnaire asked people to select a particular project, which could be either ongoing or completed, and to then base their responses solely on this project. The questionnaire then asked for data about whether a TQM-type programme existed.

In the questionnaire’s final section, more detail was sought about project management practices. Tukul and Rom (2001) developed and validated a construct indicating preferences towards the degree of customer, time, cost, quality (technical) specification, and rework focus. This framework was adapted to measure the degree of focus on customers, time, cost, quality (technical) and other stakeholders. A review of the literature highlighted the importance of psycho-social factors related to team members and staff, such as opportunities to learn and develop (Boehm and Ross, 1989) and of satisfying all stakeholders (Mallak *et al.*, 1991) therefore four statements were devised to measure the emphasis placed on stakeholders linked to these issues. The level of focus associated with each item was measured using a seven-point Likert scale. The full list of questions asked is provided in Table I. The validity of the project success construct was examined using Cronbach’s alpha test. Table II shows the results of the test.

(See Table I for extract of questionnaire.) The validity of the construct was examined using Cronbach’s alpha test. The internal consistency for the amended part of the construct, namely the addition of stakeholder focus, is strong (alpha value 0.72), suggesting that the construct is a valid measure.

- Customer-focus*
Fully satisfying the customer's needs takes precedence over other objectives
Measuring overall customer satisfaction
Making prompt responses to customer requests
Taking corrective action to meet customer requirements
- Other stakeholder-focus*
Providing development opportunities for project team members
Providing organization learning
Fully satisfying stakeholders' needs (other than the customer) taking precedence over other objectives
Measuring overall stakeholder (other than the customer) satisfaction
- Time-focus*
Evaluating suppliers/subcontractors based on how well they meet schedules
Making additional resources available to meet project milestones and deadlines
Taking corrective action to control progress against the project schedule
Minimizing the project duration precedence over other objectives
- Cost-focus*
Taking corrective action to control project costs
Relaxing deadlines to fully meet costs
Evaluating suppliers/subcontractors based on how well they meet the agreed budget
Minimizing the project cost taking precedence over other objectives
- Technical-focus*
Evaluating suppliers/subcontractors based on how well they meet technical specifications
Taking corrective action to control conformance to technical requirements
Relaxing other constraints to meet technical specifications
Meeting the technical specification precedence over other objectives

Table I.
Emphasis on success
criteria in project
management practice

Source: Adapted from Tukul and Rom (2001)

Table II.
Cronbach's alpha score
for project success
construct

Construct	Cronbach's alpha score
Customer focus	0.76
Time focus	0.65
Cost focus	0.75
Quality (technical) focus	0.75
Other stakeholder focus	0.72

The values for customer, time, cost, and technical focus are comparable to those previously reported by Tukul and Rom in their 2001 study. The internal consistency for the amended part of the construct, namely the addition of stakeholder focus, is strong (alpha value above 0.7), suggesting that the construct is a valid measure.

Although the survey was exploratory, the authors wished to ensure that data were collected from a diverse range of project environments and project management perspectives (which would enhance the generalizability of the findings). This diversity would include: industry sectors with a high degree of focus on projects, such as construction and those with less of project focus, such as service providers; those organizations that typically take the client role on projects and those who are contracted to undertake projects on behalf of the client. Therefore a strategy of purposive and heterogeneous sampling was used.

To ensure that organisations reflecting the client perspective were included in the sample, a sub-sample of not-for-profit social housing providers (housing associations) were included. The suitability of the sub-sample was based upon the authors' personal experiences working on projects in this industry sector. To reflect the perspective of the contractors a sub-sample of construction companies were selected. As the housing associations would typically have a low focus on projects and the construction companies a high focus, a final sub-sample was made up of sundry manufacturing and service organizations that would reflect a mix of client/contractor relationships and different degrees of project focus.

Given that response rates to operations management-related postal surveys can typically be in the region of 10-20 per cent (Larson and Poist, 2004), the questionnaire was mailed to 1,200 organizations. It was anticipated that this sample size would yield approximately 150 returned questionnaires, which would be an adequate number in terms of undertaking some useful exploratory data analysis. To achieve the balance of client/contractor perspectives and degrees of project-focus (discussed previously) the 1,200 sample was made up of: 350 members of the National Housing Federation (NHF) randomly selected from the NHF's *Directory of Members*; 200 organizations in the Fame database (which contains details, including industry sector and number of employees, of 5 million UK organizations) randomly selected from those categorized as construction companies; 650 organizations randomly selected from the Fame database, with the following business codes: manufacture of food products and beverages, manufacture of chemicals and chemical products, electricity, gas, steam and hot water supply, computer and related activities, research and development, public administration and defence, compulsory social security, health and social work.

Before posting, the questionnaire was piloted with three key informants, representing a housing association, a construction company and a service provider. The main purpose of the piloting was to ensure that there were no problems with the wording of questions and any project-management terminology used. A few minor amendments were made to the wording of questions based on feedback from the pilot. The questionnaire was then mailed with an accompanying letter explaining the purpose of the survey. In total, 176 (15 per cent) responses were received from the 1,200 questionnaires posted (which was in line with expectations). In total, 53 (15 per cent) returned completed questionnaires were received from the housing association sub-sample, 38 (19 per cent) from the sub-sample of construction companies and 85 (13 per cent) from the sundry manufacturing and service-provider sub-sample. The number of returned questionnaires was regarded as

acceptable for exploratory data analysis, with adequate representation of the three sub-samples. Therefore no further mailing was undertaken.

Results

Of the respondents, 38 (22 per cent) had the job title of project manager; 138 (78 per cent) did not. However, another 81 (46 per cent) respondents stated they were involved in the management of projects, despite not having a formal job title of project manager. In all, 119 (68 per cent) respondents worked in the managing of projects. The other 57 (32 per cent) respondents held related project management positions, such as sponsor and project team member. For 65 (37 per cent) organizations, a TQM programme was in place, versus 111 (63 per cent) organizations reporting that either no such programme existed or the existence of such a programme was unknown.

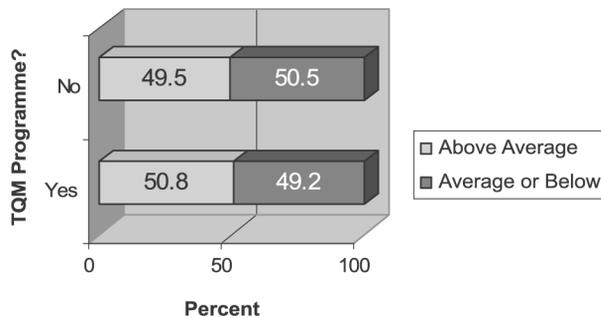
To investigate the hypotheses, a distinction was made between the respondents who had above average iron/golden triangle-focus, customer-focus or other stakeholder-focus, and those who had an average/below average focus. To make this distinction, the mean score for the statements relating to iron/golden triangle-focus, customer-focus or other stakeholder-focus (see Table I) was calculated and those respondents with scores below the mean were classed as above average and those with scores at or below the mean were classed as average or below (after Tukul and Rom, 2001). The Chi Square test was then used to compare the observed and expected levels of focus of those with TQM programmes in place in their organization and those with no such programme.

The results were as follows:

- H1. Respondents working in companies with a recognized TQM programme are more likely to be time, cost or quality (technical)-focused in their practices for managing a project than respondents in companies with no recognized TQM programme.

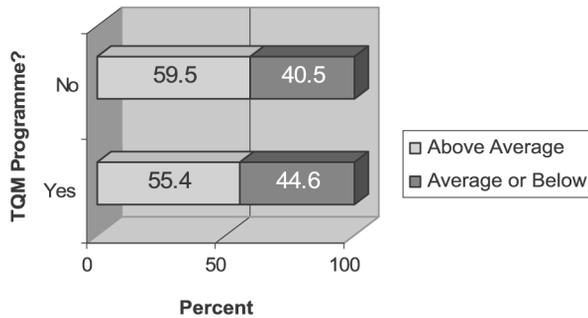
The results of the Chi Square test (see Figures 1-3) *do not support* the hypothesis that those working in companies with TQM programmes are more likely to be time, cost or quality (technical)-focused in the management of a project than those with no TQM programme.

- H2. Respondents working in companies with a recognized TQM programme are more likely to be customer-focused in their practices for managing a project than respondents in companies with no recognized TQM programme.



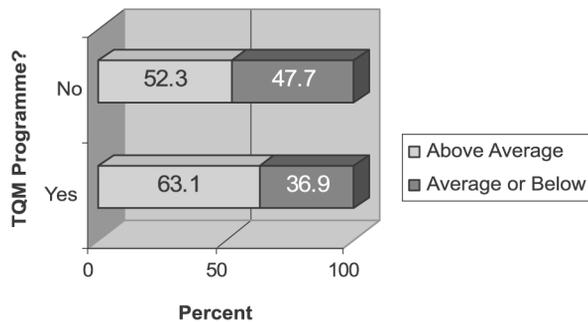
Chi Square = 0.024 1df p = 0.870

Figure 1.
Influence of TQM programme on time-focus



Chi Square = 0.279 1df p = 0.597

Figure 2.
Influence of TQM programme on cost-focus



Chi Square = 1.952 1df p = 0.162

Figure 3.
Influence of TQM programme on technical-focus

Of the 65 respondents having a TQM programme in their company, 49 (75.4 per cent) were classed as having an above average customer-focus in the management of their project. The remaining 16 (24.6 per cent) were classed as having a below average customer-focus. The results of the chi square test (see Figure 4) *support* the hypothesis that those working in companies with TQM programs are more likely to be customer-focused in the management of a project than those lacking a TQM programme.

H3. Respondents working in companies with a recognized TQM programme are more likely to be focused on stakeholders other than the customer in their practices for managing a project than respondents in companies with no recognized TQM programme.

The results of the chi square test (see Figure 5) *do not support* the hypothesis that those working in companies with TQM programmes are more likely to be other stakeholder-focused in the management of a project than those with no TQM programme.

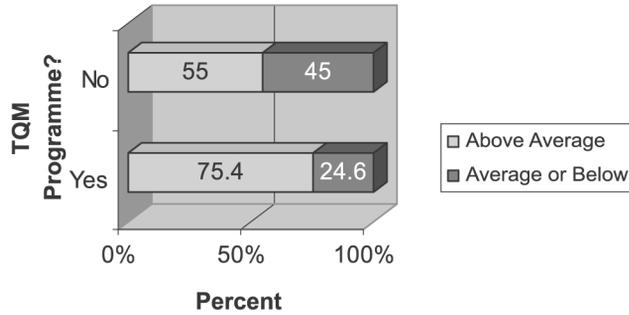


Figure 4.
Influence of TQM
programme on
customer-focus

Chi Square = 7.3 1df p = 0.007

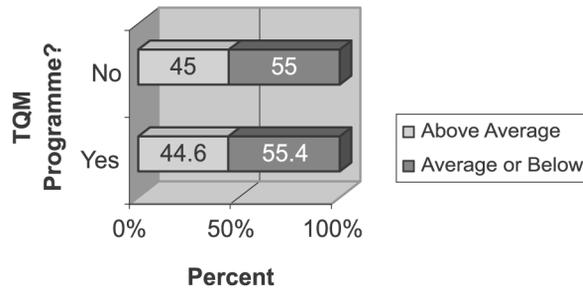


Figure 5.
Influence of TQM
programme on other
stakeholder-focus

Chi Square = 0.003 1df p = 0.956

Conclusions and implications for further study

The first broad finding was that there was no link between the level of focus on the iron/golden triangle and the existence of a TQM programme. This can perhaps be explained by the fact that, as was discussed in the introduction, PM practices focused on the iron/triangle are the most commonly used and will typically exist in some form in most project environments.

The second finding related to the relationship between a TQM programme and the level of customer-focus in PM practice. The existence of such a relationship suggests that TQM is an antecedent to customer-focused PM, and given the link made in prior studies between customer-focus and performance, the relationship may provide evidence of some of the processes needed if an organization wishes to increase the level of customer-focus in the management of its projects. For example, generic factors identified in successful TQM implementations include a clear understanding among management of the nature and purpose of any improvement programme, a clear understanding of other approaches to improving quality, such as ISO 9000, and the potential benefits to be achieved by such a programme (Taylor and Wright, 2003). By translating these factors to a project context, an organization might be able to use elements of a TQM programme to facilitate the introduction of customer-focused

project management. For example, establishing best-practice from one of the findings of Taylor and Wright's study, if an organization wished to move towards a "partnership-type" approach to PM that typically requires a high level of customer-focus (Winch *et al.*, 1998) senior management would need to clearly understand the nature and purpose of any changes in PM practices that were proposed.

The survey reported in this paper is exploratory in nature and focused on investigating whether there is a link between the focus of project management practices and the existence of a TQM programme. Having established a link in respect of customer-focused practices there is a need for further research in this area. In particular, in-depth study is required to understand the relationships and interactions between the diverse elements that constitute TQM and customer-focused PM practices.

The absence of any evidence of a link between the existence of a TQM programme and the level of other stakeholder-focus is also noteworthy. This result may not necessarily reflect any deficiencies in this area on the part of TQM programmes, but rather further confirmation that in project environments the processes for managing stakeholders are poorly understood and ignored (Maylor, 2001). Clearly there is the potential for further study in terms of understanding what the barriers are to the management of project stakeholders and what processes are needed to break down the barriers and introduce an effective stakeholder management process. Indeed further study is required to investigate in more detail the relationships between elements of a TQM programme and factors that may moderate, and perhaps negate, any positive influence of having implemented TQM. For example, although the theoretical benefits of focusing on satisfying other stakeholders have been highlighted in the literature, there is some evidence that in some project environments a particular problem is unwillingness on the part of all parties to commit to the principle in practice, due in part to commercial pressures (Chan *et al.*, 2003; Ng *et al.*, 2002). A useful line of enquiry will be to examine how this and other extraneous variables interact with TQM programmes to impact on the level of focus on other stakeholders in PM practice (and to establish whether there are any fundamental limitations in the TQM implementations that help explain why TQM organizations are not more stakeholder-focused in their PM).

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