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Examining the influence of participant performance factors on contractor satisfaction: A structural equation model

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Abstract

Participant performance is critical to the success of projects. At the same time, enhancing the satisfaction of participants not only helps in problem solving but also improves their motivation and cooperation. However, previous research related to participant satisfaction is primarily concerned with clients and customers and relatively little attention has been paid to contractors.

This paper investigates how the performance of project participants affects contractor project satisfaction in terms of the client's clarity of objectives (OC) and promptness of payments (PP), designer carefulness (DC), construction risk management (RM), the effectiveness of their contribution (EW) and mutual respect and trust (RT). With 125 valid responses from contractors in Malaysia, a contractor satisfaction model is developed based on structural equation modelling.

The results demonstrate the necessity for dividing abstract satisfaction into two dimensions, comprising economic-related satisfaction (ES) and production-related satisfaction (PS), with DC, OC, PP and RM having significant effects on ES, while DC, OC, EW and RM influence PS. In addition, the model tests the indirect effects of these performance variables on ES and PS. In particular, OC indirectly affects ES and PS through mediation of RM and DC respectively. The results also provide opportunities for improving contractor satisfaction and supplementing the contractor selection criteria for clients.

Keywords: Contractor satisfaction; Structural equation model; Project success; Satisfaction dimensions; Participant performance factors

1. Introduction

The construction industry plays an important role in providing employment opportunities and enhancing economic development, especially in developing countries such as China, India, and Malaysia (Doloi et al., 2012; Ye and Xiong, 2011; Yong and Mustaffa, 2012). However, the industry has a poor record for project success in terms of cost, time, quality, etc. Participant satisfaction is a crucial aspect of this, as noted by Al-Tmeemy et al. (2011) and Leung et al. (2004), in addition to qualified project completion.

Participant satisfaction describes the level of "happiness" of project participants and slow decisions made by clients, poor labour productivity, and architects' reluctance to change, for example, contribute to both reduced satisfaction and unsuccessful projects (Doloi et al., 2012). Enhanced satisfaction, therefore, not only helps to improve motivation and cooperation among participants but also increases the likelihood of successful project completion, making its evaluation important in judging the success or otherwise of a project.

Construction contractors are responsible for the actual production work involved (cost management, schedule management,

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quality management, etc.) in projects and so their performance is critical to the success of projects. Furthermore, replacing a contractor with another during project execution is very costly. It is therefore important to understand the factors influencing contractor performance, and measuring the degree of contractor satisfaction offers a means of achieving this as well as providing an opportunity to enhance the effectiveness of cooperation between contractors and other participants. That is to say, contactor satisfaction is central to maintaining the cohesiveness and level of teamwork needed for a project (Chan et al., 2002).

Previous satisfaction research in construction, however, is concerned much more with the satisfaction of clients and customers than that of contractors. In addition, current limited studies on measuring contractor satisfaction consider only the effects of client behaviour and regard satisfaction holistically (Soetanto and Proverbs, 2002). A more detailed, multi-dimensional account of contractor satisfaction will take into account the behaviour of the different participants involved.

Structural equation modelling (SEM) enables this to be done. Developed from data collected by a postal survey of Malaysian construction contractors, a structural equation model demonstrates that project participants appear to fundamentally influence contractor satisfaction on two dimensions: economic-related satisfaction and production-related satisfaction. Corresponding hypotheses are also developed and tested by applying SEM, describing the causal relationships involved in terms of satisfaction dimensions and associated participant performance factors.

2. Literature review

The concept of customer satisfaction emerged in the early 1980s in the USA and subsequently widely used in the fields of psychology, business, marketing and economics (Liu and Leung, 2002). Defined as the response to the difference between 'How much is there?' and 'How much should there be?' (Wanous and Lawler, 1972), satisfaction is particularly useful in the measurement of performance outcomes (Nerkar et al., 1996).

In the construction industry, the term 'satisfaction' has become progressively used over the past decade, its increased attention being taken to indicate a positive change from a pure focus on business performance to a greater emphasis on stakeholder performance (Love and Holt, 2000). Therefore, in addition to the traditional objective outcome measures of time, cost and quality, measuring satisfaction has become another effective way of helping to improve project performance, especially for large and complex projects (Cheng et al., 2006; Ling et al., 2008; Toor and Ogunlana, 2010). Furthermore, satisfaction can boost repeat business and increase long-term profitability (Wirtz, 2001).

There exist a variety of applications of satisfaction measurement in the construction context. These comprise studies of client satisfaction levels associated with contractor and consultant performance (Cheng et al., 2006; Mbachu and Nkado, 2006); customer satisfaction with the products and services of the industry (Maloney, 2002; Yang and Peng, 2008); and homebuyer and occupant satisfaction in terms of comfort (Paul and Taylor, 2008; Torbica and Stroh, 2001). Leung et al. (2004) also measures the degree of correlation between project participant satisfaction and potential contributing factors.

However, although there are studies measuring contractor performance, contractor satisfaction has received much less attention. The sole example to date is that of Soetanto and Proverbs (2002), who establish an overall contractor satisfaction regression equation based on responses from 80 top UK contractors. However, this is restricted to the measurement of contractor satisfaction exclusively in response to client behaviour. Extending this to accommodate the influence of other participants has yet to be undertaken.

Satisfaction in the construction industry is also viewed as a holistic entity in current research on client satisfaction, homebuyer satisfaction and contractor satisfaction (Cheng et al., 2006; Kärnä et al., 2009; Paul and Taylor, 2008; Soetanto and Proverbs, 2002). However, research conducted in the manufacturing industry demonstrates the importance of distinguishing economic satisfaction from non-economic satisfaction in manufacturer–distributor relationships (del Bosque Rodríguez et al., 2006). Although construction is uniquely different to manufacturing in many ways, the role of manufacturers in the production and transfer of products to the market via distributers has some similarity with the role of construction contractors, who construct and transfer products to clients directly or via client to end users. It is likely, therefore, that construction contractor satisfaction will benefit from receiving a similar decomposition.

3. Research method

To examine the influence of participant performance factors on contractor satisfaction, two main research methods are adopted: questionnaire survey and structural equation modelling (SEM). Eighteen hypotheses are first proposed according to the literature review. A conceptual model is then developed based on these hypotheses by SEM. In the questionnaire design, Keline's (2005) principle, which uses three measurement variables to reflect one latent variable, is applied in order to obtain a stable equation structural model. 125 complete and reliable responses collected from contractors in Malaysia comprise the basis for the data analysis.

3.1. Hypotheses

One conceptualisation of satisfaction is in the form of an input–process–output system where, although the internal process is still unknown, performance outcomes provide an input leading to satisfaction/dissatisfaction as the output (Soetanto and Proverbs, 2002). Performance outcomes are determined by different construction project participants, with contractors, as performance assessors, having their own psychological interpretation of the performance levels of others (Soetanto and Proverbs, 2002). Thus, the satisfaction of contractors is treated as being caused by participant performance.

The Construction Industry Development Board (CIDB), which was established by the Malaysian Federal Government in 1994 and is in charge of planning direction of the industry, reported in its 2006–2015 construction industry plan that project