

Effects of cooperative procurement procedures on construction project performance: A conceptual framework

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Abstract

In this paper, we develop a testable holistic procurement framework that examines how a broad range of procurement related factors affects project performance criteria. Based on a comprehensive literature review, we put forward propositions suggesting that cooperative procurement procedures (joint specification, selected tendering, soft parameters in bid evaluation, joint subcontractor selection, incentive-based payment, collaborative tools, and contractor self-control) generally have a positive influence on project performance (cost, time, quality, environmental impact, work environment, and innovation). We additionally propose that these relationships are moderated or mediated by the collaborative climate (i.e. the trust and commitment among partners) in the project and moderated by the overall project characteristics (i.e. how challenging the project is in terms of complexity, customization, uncertainty, value/size, and time pressure). Based on our contribution, future research can test the framework empirically to further increase the knowledge about how procurement factors may influence project performance.

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1. Introduction

Since construction projects and/or their outcomes heavily affect our modern society, the importance of a well-functioning construction industry is beyond doubt (Cheung et al., 2001). In many countries the construction industry has, however, attracted criticism for inefficiencies in outcomes such as time and cost overruns, low productivity, poor quality, and inadequate customer satisfaction (Egan, 1998; SOU, 2000; Yasamis et al., 2002; Chan et al., 2003). Practitioners, researchers, and society at large have, therefore, called for a change in attitudes, behaviour, and procedures in order to increase the chances for project success and improved end products (Dubois and Gadde, 2002). The client is proposed to act as a change agent in such a change (Egan, 1998; SOU,

2000). The way the client deals with procurement determines responsibilities and authorities in the entire construction process, affecting the degree of integration and cooperation among project participants (Love et al., 1998; Briscoe et al., 2004). Since traditional procurement procedures cause adversarial relationships and many problems in all stages of the buying process, this is a vital improvement area that can contribute substantially to project success (Cheung et al., 2003; Eriksson and Laan, 2007). Although procurement procedures need to be tailored to enhance the fulfillment of different project performance objectives (Cox and Thompson, 1997; Wardani et al., 2006), clients tend to choose those procurement procedures that they have a good knowledge of and a habit of using, regardless of any differences between projects (Love et al., 1998; Eriksson, 2008b). For a new procurement procedure to be implemented, clients need to feel confident of how to use it and have positive attitudes towards its effect on outcomes (TysseLand, 2008). Hence, the key to a change of practice lies in an increased

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understanding of how different novel procurement procedures actually work and affect project performance.

Even though issues relating to procurement procedures seem highly important for accomplishing project success, earlier research on this topic is limited. The few conducted investigations focused on how only one or a few procurement related factors affect a few project outcomes. Examples are how bid evaluation affects cost and schedule growth (Assaf and Al-Hejji, 2006; Wardani et al., 2006), how technology usage (joint IT-tools) affects cost and time performance (Yang, 2007), and how the use of partnering tools affects partnering success (Tang et al., 2006). In order to achieve successful governance of construction projects, a holistic and systemic approach to procurement procedures is crucial (Cox and Thompson, 1997; Eriksson, 2008a; Pesämaa et al., 2009). The purpose of this study is therefore to develop a testable holistic procurement framework that examines how a broad range of procurement related factors affects project performance criteria. By doing this, the paper will contribute with both a holistic perspective on procurement effects on performance and a detailed perspective, discussing specific procedures' effect on certain performance criteria. By using this framework in future empirical investigations, it will be possible to analyse if and how different factors and criteria interact and affect one another. To fulfil the aim, a comprehensive literature review of procurement related success factors and success criteria reflecting construction project performance is carried out.

2. Success criteria reflecting project performance

“Success criteria are the measures by which success and failure of a project will be judged” (Cooke-Davies, 2002, p. 185). Traditionally, researchers and organisations have focused on the three success criteria of *cost*, *time*, and *quality* (Belassi and Tukel, 1996; Chua et al., 1997; Swan and Khalfan, 2007). This “iron triangle” focuses on short-term aspects of performance crucial for clients' immediate project success. Since sustainable development is becoming increasingly vital, consistently successful projects are important from a corporate perspective (Cooke-Davies, 2002). For professional clients with concern for long-term competitive advantage and sustainable development the iron triangle is therefore too limited; all stakeholders' objectives must be considered (de Wit, 1988). Hence, this literature review has identified three additional performance aspects vital for sustainable success: *environmental impact* (Chan and Chan, 2004; Swan and Khalfan, 2007), *work environment* (Chan and Chan, 2004), and *innovation* (Harty, 2008).

Environmental impact has become a critical issue in recent years since the construction industry is acknowledged as one of the major contributors to environmental problems (Tam et al., 2006a,b). In the modern construction industry, environmental impact therefore needs to be included in the list of success criteria to assure sustainable

development. Environmental impact may include emissions, energy usage and toxic substances associated with the construction process and the final product.

The labour-intensive construction industry has a poor *work environment* record and is still generally a dangerous work place in terms of health and safety (Ai Lin Teo et al., 2005; Rwamamara, 2007; Ling et al., 2009). In today's knowledge intensive society increased attention to human resources is required to attract the intelligent and creative young people that the industry so badly needs for developing and sustaining long-term competitive advantage (Green, 2002). Since a safe work environment is a requirement for sustainable development (Rajendran and Gambatese, 2009), it is a critical success criterion in our framework. Work environment may include number of accidents and sick leave days.

Traditionally, the construction sector has been seen as a low tech industry, with little *innovation* compared to other industries (Reichstein et al., 2005; Harty, 2008). In recent years, however, innovation in construction has received increasing interest in an explicit manner, both among practitioners and academics (Reichstein et al., 2005). Innovation is a vital success criterion, enhancing both long-term competitive advantage and sustainable development. Innovation may include both new methods/processes (process innovation) and new materials and technologies in the final product (product innovation).

3. Procurement related success factors

“Success factors are those inputs to the management system that lead to the success of the project” (Cooke-Davies, 2002, p. 185). As pointed out in the introduction, earlier Project Management research regarding procurement methods' impact on project performance lacks a holistic view. However, based on transaction cost economics (TCE) and industrial buying behaviour literature, Eriksson (2008a,b) and Eriksson and Nilsson (2008) have developed a systemic and holistic conceptual model regarding clients' procurement procedures during all stages of the buying process, starting with the design of the product and ending with performance evaluation. As illustrated in Table 1, all procurement related choices will affect whether the focus of the governance form will rely more on competition or on cooperation. A cooperative governance form is established by choosing the cooperative procedures in the right column, whereas the alternatives in the competition column will result in a governance form focusing on competition. In between these opposing standpoints are cooperative choices which result in a governance form that balances competition and cooperation (Eriksson, 2008a).

According to TCE, traditional procurement focusing on competition is suitable for simple and standardised projects with low uncertainty (Eriksson, 2008b). Most construction projects are, however, not like that. There is a trend towards increased complexity, uncertainty, and time pressure in construction projects, which has rendered

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