INTERORGANIZATIONAL COST MANAGEMENT AND ITS IMPLICATIONS FOR TARGET COSTING IN CONSTRUCTION

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ABSTRACT

Target Costing is closely associated with Interorganizational Cost Management, but it does not actively involve the supplier in the buyer's cost management program. While there is a large body of literature in the supply chain and logistics area that deals with how to involve suppliers, build trust, and get them to participate as partners, very little is focused on how to integrate this concepts in a TC approach.

Based on a literature review, this study contributes to the TC research by providing theoretical insights. It discusses some implications of Interorganizational Cost Management practices for construction supply chains and presents questions to guide future research in this area.

KEYWORDS

Interorganizational cost management, constructions supply chain relationship, target costing.

INTRODUCTION

Over the last decade, there have been numerous attempts of abstraction and adaptation of Target Costing (TC) approach to the construction industry context. However, there are still gaps in knowledge needing to be filled in TC research in construction. While there is a large body of literature in the supply chain and logistics area that deals with how to involve suppliers, build trust, and get them to participate as partners, very little is focused on how to integrate this concepts in a TC approach (Ansari et al., 2007).

TC is closely associated with interorganizational cost management (IOCM) practices (Cooper and Slagmulder, 2004; Jacomit and Granja, 2011; Zimina et al.,2012) and its use can enhance a supply chain's ability to improve customer satisfaction (Lockamy and Smith, 2000). Furthermore, the poor support for IOCM is highlighted as one of the big issues in traditional cost management (Hanid et al., 2011). Therefore, there is also an opportunity to explore the potential benefits of implementing IOCM practices in construction supply chains.

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Based on a literature review, this study contributes to the TC research by providing theoretical insights. Specifically, it draws some implications of IOCM for TC research in construction domain. The paper is structured as follows. The first section provides an overview of the current state of TC research in construction. The second section introduces the IOCM's concept. The third section deals with construction supply chain relationships. The last section discusses some implications of IOCM practices for construction supply chains under a TC approach. The paper ends with questions to guide future research in this area.

TC RESEARCH IN CONSTRUCTION

To begin with, it is important to draw a distinction between two terms frequently used in the literature: target costing and target value design. TC is defined by Cooper and Slagmulder (1999) as a "feed-forward cost management technique that focuses on the design stage of a product life".

Ballard (2011) argues that the term "Target costing" has a different meaning in the construction industry and the term "Target value design" (TVD) better indicates the intent to deliver customer value, as opposed to mere cost cutting. TVD is an adaptation of the original TC concept to the construction industry (Rybkowski, 2009; Zimina et al, 2012). TVD is similar to TC but may be broadened to encompass additional design criteria beyond cost, including time, working structure, buidability, and similar issues (Lichtig, 2005).

One of the first attempts to introduce TC in construction industry was reported by Nicolini et al. (2000) in which they investigated the TC and whole life costing adoption in the British construction industry. Although Nicolini et al. (2000) could not achieve a fully-fledged version of TC in construction, the first successful application of TC in construction was reported by Ballard and Reiser (2004) in a design-build project in the USA.

Since then, TC adoption in construction has been subject to many studies: e.g. implementation along the planning and construction phases of brand retail units in Brazil (Robert and Granja, 2006), TC in public construction projects (Sobotka and Czarnigowska, 2007), analysis of the applicability of TC concepts and principles to the development of low income housing projects sponsored by a Brazilian public agency (Simoes et al., 2008) and investigation into the adoption of TC on Brazilian public social housing projects (Jacomit and Granja, 2011).

Other studies focused on the design process to achieve target cost have also emerged in the literature (Kim and Lee, 2010; Pennanen et al., 2011). More recently, Rybkowski et al. (2011) argues that TVD may not substantially compromise the final aesthetic of building design. To the best of our knowledge the current state of TC research in construction is limited to the publications presented in this section written in English only.

As we mentioned previously, TC is closely associated with IOCM, but TC does not actively involve the supplier in the buyer's cost management program. One of the greatest advantages of IOCM beyond other cost management techniques is the active involvement of both the buyer's and supplier's design teams in the joint management of costs (Cooper and Slagmulder, 2004). In the following section, we introduce the IOCM concept.

INTERORGANIZATIONAL COST MANAGEMET (IOCM)

IN WHICH ENVIRONMENT IOCM IS FAVOURABLE?

The two main elements of the IOCM are the environment in which it occurs and the effective use of its various mechanisms to reduce costs. IOCM can be successfully performed in a context in which firms have a high level of outsourcing and are facing increased levels of competition (Cooper and Slagmulder, 1999).

The use of IOCM to coordinate plans to reduce costs in companies across a supply chain can help reduce costs in three different ways. First, it can help the company and its buyers and suppliers to find new ways of designing products so that they can be manufactured at a reduced cost. Second, it can help the company and its suppliers to find ways to further reduce the cost of products during manufacturing. Finally, it can help identify ways to make the interface between companies more efficient (Cooper and Slagmulder, 1999).

DEFINITION

An effective cost management program requires careful integration of both disciplining and enabling mechanisms that operate on two dimensions: product and relationship (Cooper and Slagmulder, 1999) as it shown on Figure 1. The goal of the disciplining mechanisms is to transmit the cost-reduction aims for every aspect of buyer-supplier interactions. The goal of the enabling mechanisms is to aid the firms in the network find ways to pool their skills and coordinate their design and manufacturing efforts and the way they interact so they can achieve their cost-reductions aims together.

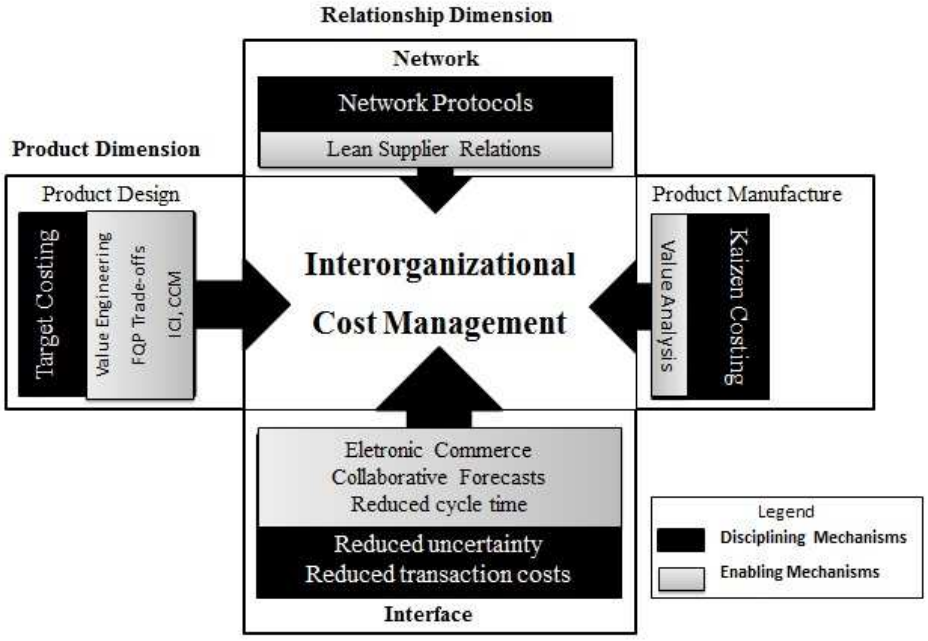

Figure 1. The interorganizational cost management process (Cooper and Slagmulder, 1999).

The product dimension operates at two levels: product design and manufacture. At the heart of IOCM for product design lie two disciplining mechanisms and four enabling ones. The disciplining mechanisms are TC and chained target costing. TC disciplines the IOCM process by establishing the cost reduction purposes for the products and their components. By chaining target costing systems, the discipline of target costing can be extended from a single firm to the supplier network.

The enabling mechanisms are value engineering (VE), functionality-price-quality (FPQ) trade-offs, interorganizational cost investigations (ICI), and concurrent cost management (CCM). The purpose of these mechanisms is to stimulate the design teams to interact in ways that enable them to find lower-cost solutions than would be possible if they acted in isolation. It is the way the disciplining mechanisms interact with the enabling ones that creates an effective IOCM program (Cooper and Slagmulder, 1999).

Kaizen costing is the primary disciplining mechanism of IOCM during product manufacture. It helps communicate the competitive pressure faced by the firm to the firm's manufacturing engineers and suppliers. Kaizen cost reduction purposes are primarily achieved through the application of value analysis.

The relationship dimension also operates at two levels: network and interface. The network level provides the environment in which the production dimension can operate. The high degree of outsourcing that characterizes the companies in IOCM context means that each company in a supply network is responsible for a small percentage of the total value-added of a product. Consequently, to achieve the full advantages of IOCM, all the companies in the supply network have to adopt lean buyer-supplier relations (Cooper and Slagmulder, 1999).

Lean supplier networks function in many respects as a single entity dedicated to producing low-cost products with the high functionality and quality that end customers demand. Two major aspects of lean supplier network shape the environment for IOCM: the type of network and the existence of network protocols.

The type of network is important because it regulates the power balance between buyers and suppliers. Network protocols are critical because they moderate the behavior of all firms in the network to ensure that buyer-supplier relationships retain the characteristics of lean supply.

The interface level deals with the way goods and services are transferred between buyer and supplier. The primary disciplining mechanisms are reduced uncertainty and decreased transaction costs. The enabling mechanisms are electronic commerce, collaborative forecasts and reduced cycle time (Cooper and Slagmulder, 1999).

More specifically, this study focuses on the relationship dimension of IOCM framework. In the following section, we briefly discuss some topics related to the promotion of collaboration among construction parties in supply chain and with the project stakeholders such as relational contracting, clusters.

CONSTRUCTION SUPPLY CHAIN RELATIONSHIPS

Create or improve collaboration along the supply chain and develop relational forms of contracting have been recommended consistently as ways of breaking the cycle of poor communication and industry level fragmentation, and the adversarial nature of construction project relationships (Nicolini et al., 2001). The lack of trust and

negative attitudes are barriers to greater subcontractor and supplier integration (Dainty et al., 2001).

Moreover, many researchers have done considerable work on contractual relationships in construction (Mathews and Howell, 2005) including contract incentive principles that promote non-economic motivation (Darrington and Howell, 2011) and conflicts between the interpretation of contract law from its Common Law base and relational contracting (Culen and Hickman, 2012).

In order to combat construction supply chain issues, Nicolini et al., (2001) argued that the clustering arrangement successfully supported efforts to improve value, eliminate inefficiencies, and reduce costs in a project. A cluster based project requires a profound redefinition of the roles and functions of all the parties involved (Nicolini et al., 2001).

There is still little understanding in current construction of what collaboration really means, what actions it implies and what responsibilities it puts on collaborating parties (Zimina et al, 2012). Cao et al. (2010) define supply chain collaboration (SSC) as "a long-term partnership process where supply chain partners with common goals work closely together to achieve mutual advantages that are greater than the firms would achieve individually" and identify seven components that comprise SCC as shown in Table 1:

Table 1: Supply chain collaboration components (Adapted from Cao et al. 2010)

Components	Definition
Information sharing	The extent to which a firm shares a variety of relevant, accurate, complete and confidential ideas, plans, and procedures with its supply chain partners in a timely manner.
Goal congruence	The extent to which supply chain partners perceive their own objectives are satisfied by accomplishing the supply chain objectives
Decision synchronisation	The process where supply chain partners orchestrate decisions in supply chain planning and operations that optimise supply chain benefits
Incentive alignment	The process of sharing costs, risks, and benefits among supply chain partners
Resource sharing	The process of leveraging capabilities and assets and investing in capabilities and assets with supply chain partners
Collaborative communication	The contact and message transmission process among supply chain partners in terms of frequency, direction, mode, and influence strategy
Joint knowledge creation	The extent to which supply chain partners develop a better understanding of and response to the market and competitive environment by working together

The last section outlines some challenges related to collaboration issues in TC approach application in construction and draws some implications of IOCM for TC research in construction domain.

IOCM'S IMPLICATIONS FOR TC IN CONSTRUCTION

When a topic is relatively young, researchers focus on developing its conceptual framework, foundation, and boundaries and generating hypotheses about them (Ansari et al, 2007). These authors also postulate that any management practice goes through five stages in its life cycle: (i) development and advocacy; (ii) technical refinement; (iii) behavioral and cultural context; (iv) linkage with other tools/process and (v) institutionalization and diffusion (Ansari et al., 2007). As a new research topic for the construction industry, we believe that IOCM can be classified at the first stage of Ansari et al. (2007)'s knowledge progression framework.

At this maturity level on construction context, the researchers focus is more appropriated to generate hypothesis rather than testing construct and relationships. In order to draw some implications, we summarize in Table 2 some challenges pointed by authors who attempted to apply TC approach in construction.

Table 2: Main challenges in TC approach application in construction

Authors	Type of project	Main Challenges
Nicolini et al., 2000	Army facilities	"The existence of long-term relations with suppliers, which include the establishment of 'open book' relations, codevelopment programmes and more, are a precondition for applying a fully-fledged version of TC."
Ballard and Reiser, 2004	Fieldhouse project	"Designing to target cost can have a beneficial impact on at least certain types of projects, beneficial both for the client and for the provider."
Granja et al., 2006	Brand retail units	"Everyone involved in the process must actively participate, by contributing suggestions and in some cases actually allowing interventions on the project."
Sobotka and Czarnigowska, 2007	Public infrastructure project	"From the viewpoint of a contractor, it is practically impossible to use TC in traditionally procured project under design-bid-build arrangements." "The highest potential of applying TC approach to public projects occurs in public-private partnership arrangements."
Simões et al., 2008	Low income housing project	"A barrier for the TC application is the lack of partnerships between the association and suppliers, because the criterion adopted is usually the lowest price."
Jacomit and Granja, 2011	Low income housing project	"Standardization and replication of design can be seen as opportunities, and the outsourcing of design and the bidding process as obstacles."
Zimina et al., 2012	Medical Office Building / Hospital project	"TVD can be equally applied on projects where the client is able to adequately specify what's wanted prior to design, so need not be a continuously active member of the project team. Design-build and various forms of private-public partnerships are among the viable alternatives."

Table 2 shows that absence of long-term relations with suppliers, lack of partnerships and the bidding process are some challenges in TC approach application in

construction. We can infer that these challenges are mostly related to collaboration issues in construction supply chain.

The relationship dimension of IOCM framework offers disciplining mechanisms to fight against these collaboration issues. It advocates that lean buyer-supplier relations are mechanisms to achieve the full advantages of IOCM.

The disciplining mechanisms of the interface level (reduced uncertainty and reduced transactions costs) are also potential ways to enhance collaborative buyer–supplier relationships. The less uncertainty in the transaction environment, the lower the transaction costs, the stronger project performance (Li et al, 2012).

CONCLUSIONS

This paper discussed some implications of a new management practice that could be further explored in the construction industry. The disciplining mechanisms of IOCM's relationship dimension can be a promising approach for better assisting TC applications in construction sector. We suggest below some questions for future research:

- To what extent could construction projects benefit from IOCM practices?
- What kinds of projects are appropriated for IOCM practices?
- To what extent could IOCM practices benefits the fragmented nature of construction supply chains?
- Which are the actions to improve the buyer-supplier relationships in construction supply chains?

The potential knowledge gaps in construction identified in this paper will be further investigated on an on-going doctoral research into how to improve the buyer-supplier interface in construction supply chains.

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