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Procurement Innovation: Perspectives from Chinese International Construction Companies

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Abstract

The international construction business is witnessing a trend that companies deliver projects through the adoption of innovative procurement systems (e.g. Building Operate Transfer, Public Private Partnership). By devising innovative procurement systems, it is possible to realise construction projects that are difficult for traditional procurement methods, to develop competitive advantages for companies, and ultimately, to deliver value to the society. Notably, Chinese companies are making impressive inroads into the international construction market through enhancing their competitiveness. However, little we know about how Chinese international construction companies (CICCs) perceive procurement innovation and how it relates to their recent success. This research aims to capture their perspectives towards procurement innovation by interviewing nine key decision-makers of CICCs and experts in this area. It is found that CICCs are gradually adopting procurement innovation as a competitive strategy. Unlike the traditional life-or-death competition, competing through procurement innovation can make more projects possible; the emergence of CICCs, in particular their strengths, can be encouraged to deliver more projects and value in the international construction market. This research not only provides CICCs with insights into the procurement innovations in the construction sector, but also enables other companies to know CICCs with which they might compete or collaborate in the near future.

Keywords: Procurement innovation, international construction, competitiveness, construction companies, China

Introduction

With the globalization of the world economy, today's construction is becoming an internationally interdependent marketplace. Statistics published by the Engineering News-Record (ENR, 2010), for example, show that the ENR's top 225 international contractors (TIC 225) generated \$383.78 billion in revenue from projects outside their home countries in 2009, up 0.4% from \$382.44 billion in 2008. This increase came despite the financial turmoil experienced in many markets. Advanced technology, fast transportation, convenient communications, effective knowledge transfer, integrated markets, and trade liberalization have all helped transcend traditional country boundaries and transform the international construction market into a place with fierce competition.

Under this circumstance, one of the main strategies for companies to compete is to sustain their competitiveness through continuous innovation of procurement systems. Innovative procurement systems such as Build-Operate-Transfer (BOT), Private Finance Initiative (PFI), Public-Private-Partnering (PPP), and prime contracting have been created to procure a number of significant projects that would not be possible for traditional approaches (e.g. MacDonald, 2002; Li *et al.* 2005; Zhang and Kumaraswamy, 2001). It thus creates new business opportunities for companies.

While a kaleidoscope of procurement innovations is happening in the international construction marketplace, little research has been conducted to investigate how they were fostered by various factors and how they sustain competitive advantages for international construction business. Notably, Chinese international construction companies (CICCs) are making impressive progress in this marketplace. Lu *et al.* (2009) reported that CICCs' business in the international market presents some new patterns: (1) CICCs are able to compete in more sophisticated markets such as the US and European although about 70% of their total turnover still comes from Asia and Africa; (2) the projects types that CICCs are able to compete for are of increasing diversity. It seems that CICCs sharpen their competitive edge by catching up this procurement innovation. However, little we know about how CICCs discern procurement innovation and how it relates to their recent success.

The aim of this research is to ascertain how CICCs perceive procurement innovation with special consideration given to how it can be used to improve their international competitiveness. The rest of this paper is structured into four sections. Firstly, literature review is conducted to understand the key concepts including procurement, innovation, and procurement innovation. Research questions are raised based on the literature review. Secondly, research design and methods are described – this is comprised of nine key decision-makers of big CICCs and experts in this area. In the third section, discussions are conducted to deepen the understanding; and research findings are presented. Finally key conclusions are drawn together.

Procurement in the construction industry

Recent years have seen a burgeoning research agenda on procurement in the construction industry (e.g. Skitmore and Marsden, 1988; Franks and Harlow, 1990; Turner, 1990; Masterman, 1992; McDermott *et al.*, 1994; Ogunlana, 1999; Rowlinson and McDermott, 1999; Walker and Hampson, 2002; Hughes *et al.*, 2006; Walker and Rowlinson, 2008). In addition to the increasing research papers, the growth in popularity in this field can also be evidenced by the formation of the International Council for Building Research and Innovation in Construction (CIB) working commission W092 – Procurement systems, and the inclusion of the topic in the PMBOK by the Project Management Institute (PMI).

Largely based on a review of the evolution of the concept in the construction sector by Walker and Rowlinson (2008), Table 1 was produced to list the various definitions of procurement that have appeared in the literature over the years. The attempts to define construction procurement reflect the changing and expanding nature of the scope of this important process in realising projects (Walker and Hampson, 2003). According to Walker and Rowlinson (2008), the construction procurement concept had been poorly defined prior to CIB W092's formation in year 1990. McDermott (1994) argues that CIB W092's definition serves a useful purpose as it is both broad, encouraging a strategic interpretation, and neutral, being applicable to developed and market economics. Rowlinson (1999) adds the systems view to construction procurement and emphasizes a procurement system including elements such as contract strategy, culture, and finance, should deserve more attention of the construction and project management fraternity.

Table 1 A list of definitions of procurement

Definitions	Sources
The amalgam of activities undertaken by a client to obtain a building.	Franks (1984)
The acquisition of new buildings, or space within buildings, either by directly buying, renting or leasing from the open market, or by designing and building the facility to meet a specific need.	Mohsini and Davidson (1989)
The framework within which construction is brought about, acquired or obtained.	CIB W092 meeting (1991)
The organizational structure adopted by the client for the management of the design and construction of a building project.	Masterman (1992)
Procurement is a strategy to satisfy client's development and/or operational needs with respect to the provision of constructed facilities for a discrete life-cycle.	Lenard and Mohsini (1998)
Procurement is about the acquisition of project resources for the realization of a constructed facility.	Rowlinson (1999, p34)
From the project management point of view, procurement is the process of acquiring project required resources; it includes development of the procurement strategy, preparation of contracts, selection and acquisition of suppliers, and management of the contracts	Association for Project Management, (2005)
The processes required to acquire goods and services, to attain project scope, from outside the performing organization.	PMI (2004)

Kumaraswamy and Dissanayaka (1998) traced and linked definitions of “procurement” as “the action of process of acquiring or obtaining material, property or services at the operational level”; “building procurement” as “the amalgam of activities undertaken by a client to obtain a building”; and “construction procurement” as “the framework within which construction is brought about, acquired or obtained” in a less confrontational manner. Herein we prefer to deem a building and construction inclusively as a constructed facility. It thereby seems that there are two levels of analysis of procurement in construction: one is literal and relatively narrower meaning of buying resources and the other is a figurative and wider sense of purchasing a facility within a broad framework involving features such as culture, management, economics, environment and political issues.

Procurement Innovation

Procurement innovation can be understood differently by placing different emphasis on “procurement” or “innovation”. The concept has been used to stand for how procurement, too often predominated by insatiable clients, can be conducive to innovation, which has been widely considered to drive business competitiveness, improvements, and ultimately, economic growth. For example, a CBI/QinetiQ Innovation (2006) reported that public procurement spending in the UK stands at around £150bn a year. The potential for using these spends to stimulate innovation in the UK was recognized in the DTI's 2003 innovation report. In the construction sector, this concept is also the underlying inquiry of many research projects. For example, a series of studies carried out by the Health and Care Infrastructure Research and Innovation Centre (HaCIRIC) in the UK look for relations between the procurement methods and innovation adoption in hospital infrastructure procurement. The Built Environment Industry Innovation Council (BEIIC) in Australia also believes that better procurement practices can catalyse innovation and deliver infrastructure more effectively.

Alternatively, the concept can be understood as innovative procurement in contrast to those “traditional (conventional)” procurement methods in construction. Nonetheless, it is difficult to delineate a clear boundary between the “traditional” and “innovative” procurement methods. For example, writers generally agree that traditional approach procures projects involving discrete phases from design development, tender, contract development, to construction delivery (Walker and Hampson, 2003:13; Walker and Rowlinson, 2007:45). According to Masterman (1992), this traditional procurement approach has been commonly adopted since the end of the 1700s. Design and building (D&B) mode and its variants emerging later are supposed to be innovative as they are new to the industry at that time. Raisbeck *et al.* (2010) termed ‘traditional procurement’ as those including all non-PPP procurement policies, including D&B and ‘alliances’, although PPP as a co-operative and integrated procurement system has been discussed by Masterman dated back to year 1992.

According to OECD and Statistical Office of the European Communities (1997), to innovate is the introduction of technologically new products or processes that are new to the organization. Innovation is also defined as an idea, practice, or object that is perceived as new by an individual or other unit of adoption (Rogers, 1995). If we take these definitions, any idea, practice, or object can be innovative as far as it is perceived as new by its adopter. Thus, it is possible that a conventional procurement method will be perceived as innovative by others, i.e. the Third World countries. Innovative procurement means different things to different adopters. Based on the above discussions, a working definition of procurement innovation is briefly defined as *new methods to acquire project resources such as finance, technical skills, materials, labours, and professional services for the realization of a constructed facility.*

It might be more helpful to understand the concept by enumerating those procurement methods that can be categorized as “innovative”. Hughes *et al.* (2006) suggest that to define procurement, the following six aspects of procurement must be defined at the same time: (1) ownership; (2) selection method; (3) price basis; (4) responsibility for design; (5) responsibility for management; and (6) amount of sub-contracting. The combination of these aspects proffers a wide range of procurement options where innovations could take place. It is thus almost impossible to enumerate all the options of innovative procurement systems in order to help understand the concept. However, in addition to the working definition above, to have a general, if not crystal clear, idea of real instances of procurement innovation is vital for the research design in this study. In view of the state of the art of procurement in the international construction market, this study intends to deem *those co-operative and integrated procurement systems, mainly PPP such as BOT, PFI, D&B as real options of innovation procurement while it opens to any innovative options emerging from a certain political, economic, social, technological, legal and environmental background.*

Chinese international construction companies (CICCs)

The global construction market in recent years has witnessed a fast expansion of Chinese international construction companies (CICCs). This has been echoed by an article

reporting that many international contractors see Chinese and Indian contractors rapidly becoming a force in the marketplace (Reina, 2007). Latest statistics show that 54 CICC were listed on the ENR's Top 225 International Contractors (TIC225) in 2010, and in 2009 alone gained total contracting revenue of \$50.57 billion from their overseas construction market (ENR, 2010). Although many construction firms have grown to become huge through expansion of services and acquisition over the past few years, no group has grown like the major Chinese contracting firms (ENR, 2010). The fast expansion is a result of the internationalization of CICC, which is widely called "going-out" strategy, referring to an overall strategy that was formally set forth in 1998 by the Chinese central government to encourage companies in various industrial sectors to compete in the international arena (Xing 2002).

Of particular interest is some trends relating to CICC in the international market. Lu *et al.* (2009) reported that the regional markets that CICC are able to compete are diversified. The projects undertaken by CICC were distributed mainly in their traditional market - Asia and Africa. In 2005, for example, about 70.8% of the total turnover for CICC came from these two markets. But they started to edge into the U.S. and European market, weakly though. Second, the projects types for which CICC are able to compete are of increasing diversity. Some companies, which only undertook building projects or provided labour service in the past, are expanding to a variety of sectors such as water, power, petroleum, transportation, telecommunications, etc. CICC are able to conduct procurement innovations such as financing, building, operation by formulating consortium with other organisations. In the face of this emerging force, it is not clear how CICC perceive procurement innovation and how it is used as a competitive strategy to sustain their recent success. This led to the basic research questions underpinning this study.

Research design and methods

To make sense of CICC's perspectives towards procurement innovation, a bunch of questions were raised as following:

- (1) Are there any interesting innovative procurement examples in your experience?
- (2) Shall we relate these innovations to the background they are growing from, e.g. globalization, and a given Political, Economics, Social, Technology, Environmental, and Legal (PESTEL) setting?
- (3) What are real instances of procurement innovations adopted by CICC?
- (4) To which extent can we say that the recent success of CICC has benefited from these procurement innovations?
- (5) By considering the strengths, weaknesses, opportunities, threats, what do you think CICC should do to achieve bigger international success through procurement innovation?

The questions, based on authors' experience and previous literature review, were designed in a way that allows some general "chat" at the beginning and then more specific viewpoints towards CICC. Given that both procurement innovation and CICC are broad topics, it is extremely difficult, if not completely impossible, to enumerate all

questions that can cover every interesting area. The questions are thus raised to capture meaningful, yet not necessarily exhaustive, “perspectives” from CICC’s.

Apparently, there is no ready data to answer the above questions directly. Soon it reaches a consensus amongst the authors that qualitative research such as interviews should be conducted to collect the CICC’s’ perspectives towards procurement innovations. Interviews also allow for an in-depth interpretation of this topic. To make sure that insightful perspectives will be captured, it was required that the interviewees should be at executive level or above, particularly abounding with experience in international construction. This further limited the number of interviewees but fortunately with strong contacts, nine interviews have been conducted. Under the term of the data policy agreement, the names of the interviewees and their company names are to be kept confidential.

Before the interviews, the questions were sent to the potential interviewees for preview, and a suitable date was then agreed. Some of the interviewees were conducted face-to-face while for others, as they were mainly based in major cities in China, telephone interviews were conducted. The interviews generally started with an explanation of the concept of procurement innovation. This was followed by the interviewees explaining the work and structure of their organizations. The research questions listed above were asked one by one. It is not necessarily for them to just briefly answer these questions which have been sent to them in advance. They were encouraged to talk in greater detail if a certain aspect is of particular importance. Each interview lasted 40–60 minutes. Not all nine interviews were recorded in audio but notes were taken in a way to ensure that key messages given by the interviewees will not be omitted. They were transcribed to allow for subsequent analyses and good attention has been paid to language usage to ensure no information would be lost in the translation.

Analyses, discussions, and findings

Analyses of CICC’s’ perspectives towards innovative procurement systems were started from China’s indigenous construction market for two reasons. First, most CICC’s have both domestic and overseas businesses, which are mutually dependent by nature. A domestic market can provide a business buffer for conducting international construction, particularly when it is in a recession. For example, the ENR (2010) reported that companies including China Railway Group Ltd., China Railway Construction Corp. Ltd., China State Construction Engineering Corp., China Communications Construction Group and China Metallurgical Group Corp. report a combined total of \$326 billion in new contract awards in 2009. Of that, 85% was from domestic projects in China as their home market. In addition, according to Porter (1990), a sophisticated domestic market is an important element to producing international competitiveness. It is thus legitimate to investigate innovative procurement systems in China, and to examine how they foster CICC’s’ competitiveness in the international market, which is bound to be different from China in many ways.

First of all, interviewees pointed out that the main procurement mode in China is still the

traditional DBB (Design+Bid+Build), although it was introduced as an innovation in 1984 when competitive bidding and tendering was not a market mechanism. The interviewee E reflected that:

Over the past decades, we have made significant improvement in engineering, technical skills, and construction methods. We are doing fine in project management. These are all achieved within China's market conditions; the whole China is a massive construction site. The increasingly sophisticated market helps achieve the above improvement. But we have not really made major breakthrough in procurement innovations. China is a big government, and a big client. (The interviewee may imply this has constrained procurement innovation in China).

More specifically, the academic interviewee F in Table 2 pointed out that the current legal and regulation system is only conducive to traditional procurement modes:

For example, before any soil can be excavated, you have to get approval of the drawings. You can start next step only after the previous step has been approved (by government administrative departments).

However, he continued to argue:

Procurement innovation is something continuously happening in China, which has been an active part of the international construction market, even before its entry to WTO. Overseas companies entered China, bringing their innovative procurement methods such as EPC and BOT. Chinese companies are learning. For example, EPC is promoted by the government. BOT projects are widely reported, although without a special regulation on it. China's business environment is changing rapidly, which presents many challenges and opportunities for procurement innovation.

The Interviewee F suggested that innovative procurement systems can be derived from traditional systems, or they can be created by adjusting existing systems, or the both. Attentions should be paid to the past situations from which they were generated, and their suitability to the new environment.

If, for the time being, it is not a key issue to judge whether these are real procurement innovations in China's indigenous construction marketplace, we can alternatively focus on CICC's strengths and weaknesses, and investigate how they deal with the opportunities and threats presented by procurement innovations in the international arena. Through analysing the interviews, it is generally noticed that CICC's have relatively abundant finance in hand, as a result of fast development over the past years. Construction, if conducted using traditional modes, is not an extremely capital-intensive business. In addition, many companies, in particular those SOEs, raise fund by listing themselves in the stock markets in Mainland China or Hong Kong. Although it is not certain whether their finance is as strong as those institutional investors, they can be treated as a new force in terms of financing international projects. Moreover, CICC's have developed delivery capabilities such as engineering expertise, technical skills, resource channels, and project management capacity. A "can-do" culture is highly respected amongst construction companies. CICC's can be treated as a new delivery force in the international construction market.

Coming to the international construction market, it is generally observed that there are two trends in innovative procurement approaches. Firstly, public procurement is shifting from traditional state-led approaches to partnering between public and private sectors (Godfrey, 1996; Egan, 1998; Savas, 2000; Winch, 2000; Chan *et al.*, 2003; Cheung *et al.*, 2003). Secondly, integrated approaches are adopted to reduce the fragmentation and discontinuity by which the construction sector has long been plagued (Anderson *et al.*, 2000; Dubois and Gadde, 2002; Evbuomwan and Anumba, 1998; Leiringer and Green, 2006; Baiden *et al.*, 2006). Procurement innovations present new challenges to the traditional financing, architecture, engineering, construction, and operation individually, and require the integration of the processes as a whole.

Many CICC's are not acclimatized to the new challenges. Project financing is still a new area for Chinese companies. An interviewee reflected that:

We dare not set our foot in BOT, either in domestic or international market.

We prefer investing in less risky areas, for example, we do have investment in cotton mills.

It is not new knowledge to CICC's that design including architecture and engineering not only is a high value-added profit center on its own right, but also has a knock-on effect on subsequent businesses such as construction, and export of materials and machineries. This is particularly true when international clients are increasingly adopting integrated approaches (e.g. D&B) in procuring facilities. Big gap, however, has been witnessed between design and construction in CICC's. Owing to historical reasons such as the old centrally planned economic system, design institutes and construction companies are developed as separate profit centers. The interviewees reported that their in-house design capability is fairly weak, in comparison with those design institutes or design bureaus. In the face of the challenges by procurement innovations, design as a driving force to enhance construction competitiveness is yet to be realized.

Even for the construction part where CICC's possess much strength, the interviewees reflected that:

Some of our pride project managers, having successfully managed billion dollars projects in China, feel helpless overseas even in front of small projects with only a few millions.

The Interviewee E supplemented that:

International project managers are doing stakeholder management, while our managers are still focusing on site management only. Some of them still used the old practices. Managing build and transfer (BT) projects using traditional DBB experience is doomed to failure.

In diagnosing the problems, the interviewees ascribed them to the institutional difference.

Why CICC's possess competitive advantages in Africa? Because there is barely any institutional constraint in Africa. Our practices, good or bad, are "the practices". But in European or North American markets, we have to get used to others' game rules including international technical standards, norms, and laws. Procurement innovations, which require integration, further add to the complexity of the business environment.

Undertaking international construction business faces higher challenges by nature. Researchers have attributed the challenges to culture difference between home and host countries; they use a culture distance to inform entry mode (Kogut and Singh, 1988; Chen, 2008), or to investigate competitions in an international market (Gatignon and Anderson, 1988; Erramilli and Rao, 1993). North (1990) defined institutions as humanly devised constraints that structure economic interaction and consist of both formal rules (e.g. laws, and contractual arrangements) and informal constraints (e.g. customs, traditions, culture, and codes of conduct) that create order and reduce uncertainty in exchange. Instead of using culture, here we use institutions to stand for a broader context within which companies compete, and engage an “institutional distance” to illustrate the institutional difference between home and host countries. The case of CICC shows that an institutionally sophisticated domestic market does not necessarily guarantee competitive advantages in an international market. Rather, the institutional distance may explain the disparity of competitiveness. Procurement innovations, by requiring integration, further add to the complexity of the institutional context for international construction business.

Owing to the acclimatization, a “wait-and-see” culture towards procurement innovation has been observed in CICC. They wait for other companies, in particular those SOEs, to be “the first person to eat a crab”. This is further exacerbated by the booming indigenous construction market; some CICC are enjoying the comfort zone in China. But there are other CICC pioneer procurement innovation and use it as a proactive competitive strategy in overseas market. Interviewees reflected that

CICCs are learning by doing, although there are a lot of unsuccessful cases. We should do knowledge management. Companies paid the tuition fee (for unsuccessful cases), while the experiences or lessons are still staying with individuals.

An interviewee suggested:

If you have strong design capability, you can undertake D+B projects. If you have strong financial capability, you can conduct BOT projects. If you have unique sources for specialty machineries, you can do related EPC projects.

Basically, procurement innovation provides CICC with a lot of opportunities to sharpen their competitive edges in the international construction market.

Rather than just aligning competence within CICC, they started to collaborate with other international companies in many ways. For example, some CICC adopted a strategy, which is called “co-opetition” by researchers (e.g. Brandenburger and Nalebuff, 1996; Flanagan, 2009; Eriksson, 2008); they collaborate with other companies in one market segment, a region, or even a particular project, while compete against each other in other segments, regions, or projects. In so doing, CICC and their international counterparts can complement each other with their own strengths, and thus can materialise more projects that cannot be achieved using traditional modes.

Conclusions

Procurement innovation is defined as new methods to acquire project resources such as finance, technical skills, materials, labours, and professional services for the realization of a constructed facility. The international construction market is witnessing the

increasing adoption of procurement innovation which helps materialise construction projects, to develop competitive advantages for companies, and ultimately, to truly deliver value to the society. Meanwhile, procurement innovation presents new challenges to the traditional financing, architecture, engineering, construction, and operation individually, and requires the integration of these processes as a whole.

In the face of the new challenges, Chinese international construction companies (CICCs) are gradually adopting procurement innovation as a competitive strategy. They benefit from the huge domestic market which provides business buffer, materials, and labours for their international competition. While for the integration of technical expertise, professional services, management skills, and finance, which is of imperative importance to procurement innovation, CICCs presents uneven strengths and weaknesses. The case of CICCs shows that an institutionally sophisticated domestic market does not necessarily guarantee competitive advantages in an international market. Rather, the institutional distance between the host and home countries may explain the disparity of competitiveness.

Unlike the traditional life-or-death competition, competing through procurement innovation can make more projects possible; the emergence of CICCs, in particular their strengths, can be encouraged to deliver more projects and value in the international construction market. This paper can be read in conjunction with those trying to devise companies' competitive strategies by probing into the key trends in the international construction market. Future research was suggested to make sense of more perspectives towards procurement innovation, from not only CICCs, but also other international companies.

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