

THE USE OF EARLY CONTRACTOR INVOLVEMENT IN DIFFERENT COUNTRIES

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ABSTRACT

In recent years, many countries have employed Early Contractor Involvement (ECI) delivery system mostly for their big, complex projects with a relatively high risk profile; however they customise this method based on their needs and situations. Some countries such as UK adopted a relationship-based approach throughout the whole life of the project while the ECI being used in some other countries such as Australia is distinctly different from its UK version and more adopts a hybrid model where the contract starts with a collaborative approach and moves on to a more conventional type of contract such as Design and Construct (D&C). ECI as an emerging procurement system is still very much in its embryonic stage and there is lack of knowledge in the concept of ECI and evaluating its effectiveness when it is used. This paper, therefore, aims to contribute to this under-developed area by comparing different types of ECI as carried out in different countries to help understand implementation process and the characteristics of ECI in each context. This paper is part of the literature review of a PhD research study under progress by the first author.

Keywords: Early Contractor Involvement, ECI, Relationship-based procurement systems.

INTRODUCTION

Single-stage procurement and contractual model in which the main contractor and its subcontractors are appointed only for the construction phase, remains the common approach within the construction industry perhaps due to its familiarity, simplicity, and economic, procedural and cultural factors (Mosey, 2009). However, such a model is unlikely to obtain the best contributions of all parties to a successful project as it excludes the main contractor and subcontractors from the early design and project planning which inhibits opportunities for innovative solutions,

constructability, and health and safety planning into design (Edwards, 2009; Mosey, 2009). In particular, the problems are caused by awarding contracts solely on the basis of lowest price. Experience has shown that value for money is not achieved in either the final cost of construction or the whole life and operational costs (British Highways Agency, 2004a).

The construction industry has embarked on a sustained campaign to overcome its perceived performance problems through a number of initiatives and radically different approaches to the procurement and management of construction projects. Subsequently, emerging project delivery methods increasingly rely on collaboration between the principal, designer and builder, and are aimed at developing longer-term positive relationships. Early Contractor Involvement (ECI) procurement system is one of these new delivery methods (Scheepbouwer and Humphries, 2011). The development of ECI was based on the premise that traditional methods create the team much too late in the project development and there is little scope for innovation and consideration of constructability (Edwards, 2009). According to Alliancing Association of Australasia (2010), ECI contracting is a process where the designer and constructor work together in a contractual relationship with the client, firstly to scope and price a project (Stage1) and then to design and construct a project (Stage2). ECI is first introduced by the engineering and construction contract published by British Institution of Civil Engineering in 1998 and adopted by the British Highways Agency for their infrastructure projects. In this two-stage procurement and contractual model, client appoints design and construction professionals early in the project development process through a non-price based selection on the basis of the contractor's track record and availability, understanding of the project and quality of new ideas (Laursen and Myers, 2009), and those professionals assist in planning, assessing constructability and developing an "open book" target cost in conjunction with client. The target cost is agreed before construction, and detailed arrangements for the distribution of potential extra costs or savings are determined (Mosey, 2009).

Using ECI would offer a number of benefits to the parties involved. According to Song, Mohamed and AbouRizk (2009), contractors generally have a higher level of construction expertise compared to the owners and designers due to their comprehensive knowledge of construction materials, methods and prices, and when they ultimately become responsible for the construction operations, their input to design will have a direct impact on the quality of their own planning as well as construction performance. ECI increases the opportunity of better relationships and understanding of parties, while decreases the potential of adversarial relationship as a result of the frequent interaction and enhanced communication between parties (Rahman & Alhassan 2012). According to Chan, Chan and Ho (2003) early involvement of contractors leads to improved project delivery with reduced project cost or reduced overruns of time and cost.

Moreover, contractors realise some other benefits of using ECI including improved risk management (Mosey 2009; Rahman & Alhassan 2012; Rahman & Kumaraswamy 2005) and better constructability in design by instilling specialised construction expertise and in-depth knowledge of construction materials, methods and local practice into design (Gil, Tommelein & Ballard 2004; Jergeas & Van der Put 2001; Pocock et al. 2006; Rahman & Alhassan 2012; Song, Mohamed & AbouRizk 2009; Swainston 2006; Uhlik & Lores 1998).

There are also a number of benefits that ECI can offer to a project from consultants perspectives including improvement in the quality of design, long-term benefits to consultants by improving the quality and capability (knowledge) for their future projects, a more realistic and reliable schedule and cost estimate for the project, and better risk assessment leading to innovation (Bundgaard, Klazinga & Visser 2011)

Clients can benefit out of ECI through improved schedule, cost, safety, higher level of innovation, better risk management and quality performance (Song, Mohamed & AbouRizk 2009). Early availability of state-of-the-art knowledge from the contractor can create better awareness and understanding of risk profiles which will result in fewer changes during later stages (Bundgaard, Klazinga & Visser 2011).

DIFFERENT TYPES OF ECI

In recent years, many countries have employed ECI mostly for their big, complex projects with a relatively high risk profile; however they customise this method based on their needs and situations. Some countries adopt a relationship-based approach throughout the whole life of the project while the ECI being used in some other countries such as Australia is distinctly different from its UK version and more adopts a hybrid model where the contract starts with a collaborative approach and moves on to a more conventional type of contract such as Design and Construct (D&C). In the following sections, background information will be presented on the ECI method as implemented in different countries.

Early Contractor Involvement in United Kingdom

In the UK, some of the principles of ECI contracting are commonly used in the water industry and other sectors, as well as in Highway Maintenance Framework contracts however ECI is mainly utilised by the Highways Agency and Network Rail for their infrastructure projects. After some bad experiences with traditional methods, such as Institution of Civil Engineering (ICE) 5th Edition contracts, the Highways Agency decided to take the Latham (1994) and Egan (1998) recommendations on board and embrace best practice partnering principles included in the New Engineering Contract (NEC). They mainly used Design, Build, Finance and Operate (DBFO) and Design and Build (D&B) before adopting ECI. Although all three forms of procurement are still being used by Highways

Agency, ECI is now the preferred method. Furthermore, this approach is encouraged by the National Audit Office (NAO) and Office for Government Commerce (OGC) as it potentially reduces project duration, promotes innovation, facilitates value management and value engineering, and minimises claims (Nichols, 2007).

The implementation Process:

Under this form of ECI, tenders are invited based on an outline design, but without any pricing requirements. The invited bidding contractors are to demonstrate the attributes required entering into a contract on the basis of a joint development with the client of the design and its implementation, in exchange for payments made to cover costs on the basis of fully open book accounting (Laursen and Myers, 2009). The delivery team then develops a more accurate work estimate through additional planning and design that becomes the contract target price. When contractor and consultant through a purely qualification-based selection process are appointed as the project delivery team, the project has an approved budget price. Henceforth the target price is fixed as the baseline price for the project and a pain/gain share mechanism is created to motivate the contractor to assist with the most economical delivery option for the advance works that are not included in the contract target price (Molenaar et al., 2007).

The typical ECI delivery approach generally consists of two main phases. In Phase 1 the contractor develops the design for the project following the submission procedure to secure the necessary approvals. The submission procedure will gradually allow the principal and the contractor to agree on the various activities that are required to deliver the project and these activities will be priced in an activity schedule. In Phase 2 the contractor is paid or pays a share of any cost savings or cost overruns against the target cost which is the total of the costs for Phase 2 (British Highways Agency, 2004b).

Characteristics:

The key characteristics of the ECI being adopted in the United Kingdom are:

- The target pricing structure has been institutionalised in the contract (Molenaar et al., 2007).
- The premise of the contract generally lies in an agreed target price for the entire project.
- The contract consists of two main phases: conditional preconstruction phase and unconditional construction phase.
- Preconstruction phase is linked to construction phase establishing commercial justification for the contractor's contributions to preconstruction phase activities and also ensuring the contractor that the benefit of their preconstruction contribution will not be transferred

to a competitor who would secure the construction phase by undercutting their tender price (Mosey, 2009).

- A pain/gain share mechanism is included in the target pricing process to motivate the contractor to be innovative and design or construct the project on budget (Molenaar et al., 2007).

Early Contractor Involvement in Australia

The ECI contract in Australia is first introduced by Queensland Mains Roads in 2005. Although the method is categorised as the Early Contractor Involvement, it is genuinely an innovative approach which is not similar to any form of contract used before (particularly in the road construction industry). The premise of this innovation is that all government authorities were not ready to embrace a fully open collaborative approach such as an alliance, concerning over demonstrating value for money and having a Target Outturn Price (TOC) instead of a lump sum contract price; however the industry acknowledged the benefits would be obtained out of strategies that follow a collaborative approach. Hence, the Australian's version of ECI features a two phase strategy and can be regarded as a hybrid version of the original British version. The first phase is generally similar to an alliance delivery system and the second phase is essentially a conventional design and constructs (D&C). The aim of adopting two different approaches is to obtain the benefits of each strategy.

The implementation Process:

The use of ECI method is becoming more popular for infrastructure projects across Australia (Department of Infrastructure and Transport, 2012; Whitehead, 2009). The ECI model commonly used in Australia comprises two phases with separate contract for each phase. Phase 1, Design Development, involves a typical professional consultancy agreement between the engaged parties and includes the design progress from a concept to a preliminary design embracing approximately 70% of the entire design process, and phase 2, Design and Construction which is completion of the detailed design and construction and employs a typical traditional design and construct contract. Prior to commencement of phase 1 a business case has been already prepared by the client as well as little work on preliminary planning and detailed design report, a contractor is selected on the basis of a non-price, qualification based process similar to the consultancy selection process.. Once the contractor has been appointed; price, risks and design are negotiated and fixed and a contract based on an open book reimbursement is signed at the rates contained in the contractor's tender including margins and overhead. During phase 1, the contractor, the client and the designers work together towards achieving certain deliverables which are likely to include identifying and assessing risks associated with the project and developing an appropriate risk management mechanism. The project team jointly plan, design, document and price the project; and the contractor then

submits a “risk-adjusted price (RAP)” offer for phase 2 which is a lump sum payment covering all aspects of the project from completing the design to the construction of the project. If the offer is accepted by the principal, the contractor develops and completes the detailed design, and construction documentation, and carries out construction of the project. If the offer does not meet the project budget or fails to demonstrate value for money, the client has the prerogative to terminate the contract and owns the intellectual property rights to the design enabling him to take the project works to the market as a construction contract (Swainston, 2006).

Characteristics:

The key characteristics of Australian model of ECI contracts are:

- A two-staged approach similar to a project alliance during the first stage and a D&C contract during the second stage which follows a collaborative approach without moving radically from the traditional forms of contract (Edwards, 2009; Swainston, 2006).
- Bidders do not need to prepare a preliminary design but would often have to invest in teambuilding workshops prior to phase 1.
- The client needs to utilise some of its resources during assessment process and the assistance of external resources may be required.
- Both parties have to involve their senior management extensively during phase 1 and such management involvement will be significantly reduced during phase 2.

Early Contractor Involvement in other countries

In recent years, many other countries have attempted to employ alternative delivery systems and contractual processes that promote a greater partnership between project participants, effective construction management practices and quality assurance by moving towards integration of project-design, construction, operations and maintenance. New procurement and contracting methods influence project development and may provide a source for innovation (Nijsten et al., 2008). ECI is one of these methods which offer alignment of team goals, integrated use of risk analysis techniques and set a payment method that supports alignment and trust. These trends of early contractor involvement (ECI) seem to be acknowledged globally and can be seen in many countries such as the United States, Portugal, The Netherlands and New Zealand (Arts et al., 2007; Molenaar et al., 2007; Scheepbouwer and Humphries, 2011). Although different terminologies are sometimes used in different contexts such as Target Pricing and Integrated Project Delivery (IPD) in the United States (Cohen, 2010; Molenaar, et al. 2007); Early Supplier Involvement in Sweden (Wynstra et al., 2000); and Interviewing in the Netherlands (V&W, 2004), they all seemingly refer to the same mechanism and principles.

In the United States, a panel including federal, state and private sector professionals conducted a research through international policies, practices and technologies for potential application in the United States in 2004. One of the significant discoveries was the use of target pricing by the Highways Agency in England on its Early Contractor Involvement projects and this method was, hence, proposed to the South Carolina Department of Transportation (DOT). Washington State DOT also adopted a form of target pricing to complete a project that was in critical circumstances in 2005 (Molenaar et al., 2007). Another approach employing ECI concepts which was developed in the USA is Integrated Project Delivery (IPD) and is a procurement form that allows the project owner to not only cooperate with the design team on construction projects but also collaborate from the project initiation stage with the main contractor and sub-contractors who are involved early in project definition and design (American Institute of Architects - AIA California Council, 2007; Cohen, 2010; Dal Gallo et al., 2009). IPD is mostly used for social infrastructures or vertical building construction (Mills and Harley, 2010; Walker and Lloyd-Walker, 2011; Wood and Duffield, 2009).

ECI is mainly employed by the transportation industry in the Netherlands. In 2004, The Dutch Ministry of Transport introduced a number of corporate procurement strategies in the business plan of its operational division (V&W, MoT, Public Works and Water Management, 2004) which has resulted in a substantial changes in the request to contractors in tenders from only price based criteria to open and functional questions that dealt with the quality and value through an 'interviewing' approach (Van Valkenburg et al., 2008). The main purpose of this method was that the market parties, to whom the construction of the project is contracted out, get involved before the planning consent decision (V&W, MoT, Public Works & Water Management, 2004).

In the New Zealand, the Transport Agency (NZTA) completed several infrastructure projects under ECI method. the NZTA has structured the ECI model with three separate stages: SP1-Investigation and Research, SP2-Preparation of a detailed design, negotiation of commercial terms (including price) and contract duration, and SP3- Completion of the detailed design and physical works. Similar to the Australian model of ECI, contractor is selected on a non-price basis however a fixed priced for each stage is negotiated before starting work. The relationship between the owner and contractor relies on mutual cooperation in SP1 and SP2, but during the construction stage of project in SP3 the relationship between them is comparable to that of a Design and Built (DB) project (Scheepbouwer and Humphries,2011).

CONCLUSION

It is generally accepted that relational procurement models potentially enhance the ability to deliver high-quality projects. ECI is one of these

emerging procurement models which can be seen as an alliance-oriented arrangement in that similar alliance principles lie at the core of the relationship (Walker and Lloyd-Walker, 2012). The benefits that ECI can offer to a project and project participants have been recognised by many countries in recent years and the use of ECI is becoming more popular amongst countries worldwide. There is, therefore, a need to gain more understanding about the ECI as employed in different countries and discover its characteristics in each context. This paper studies early contractor involvement in different countries by exploring the process it is implemented and the contractual mechanism that governs this process through existing literature reviews. This study is limited to review only the implementation process and not analysing the pros and cons of each context. This paper is part of the literature review of a larger PhD research study aiming to propose a conceptual model for selecting and assessing ECI for a project by investigating the necessary Knowledge, Skills, Attribute and Experience (KSAE) of a client to be able to adopt an ECI for a project.

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