



THE ROLE OF EFFECTIVE COLLABORATION FOR SUCCESSFUL DELIVERY OF CONSTRUCTION PROJECTS

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This paper is written with the purpose of assessing the role of effective collaboration for successful delivery of construction projects. Generally, in construction industry, to come up with the successful project delivery; the construction management team has to work against any factor that may lead to cost overruns, project delays, poor quality delivery and high level of variation. Construction projects present extreme varieties and occur in different size, shape and quality. Undertaking any construction project is a process that involves many bodies and organizations. Effective collaboration between the various parties is crucial for successful completion of both design and construction. Based on a case study of a commercial building project, this work discusses how project managers can use collaboration approach to solve project challenges that may arise during execution such as high level of project variations, endless time extension and disputes between parties to the contract. Collaborative Approach in Problem Solving helps the integration of knowledge and gain of experience, to reduce payment delay, achieve the proper evaluation and control of the schedule of activities and to motivate the contractor to achieve effectiveness and efficiency. The effective collaboration between the various parties and the early involvement of the contractor are crucial for successful completion of both design and construction and the early integration of knowledge.

Keywords: Collaborative working, Construction management, Contractual relations, Project management, Proper project delivery, Contractual parties.

1 INTRODUCTION

1.1 Background

The construction industry is an economic investment and its relationship with economic development is well posited. Many studies have highlighted the significant contribution of the construction industry to national economic development (Myers 2013). Among the major economic sectors, the importance of the construction industry is unique regardless of whether the country is underdeveloped, developing or developed (Olanrewaju and Abdul-Aziz 2015). Generally, in construction industry, to come up with the successful project delivery; the construction management team has to work against any factor that may lead to cost overruns, project delays, poor quality delivery and high level of variation. Undertaking any construction project is a process that may involve many bodies and organizations. Effective collaboration between the various parties is crucial for successful completion of both design and construction.

In general, these parties can be referred to as the ‘client’, the ‘design team’ and the ‘construction group’.

As said by Lahdenperä (2012), in recent years the construction industry has experienced a development towards new collaborative project arrangements, driven by dissatisfaction with the inbuilt opportunism and adversarial relations in traditional project delivery forms like design-bid-build and design-build. Executing construction projects with a design-bid-build approach creates a separation between the design and construction processes (Forbes and Ahmed 2010). This separation is shown to hinder integration of knowledge between the technical consultant and the contractor, as well as diminishing the opportunity for contractors to have influence on the design decision (Song *et al.* 2009). Introducing collaboration and engaging the different project parties at an earlier stage of the construction project process is one way to include this construction knowledge and create better relationships between the client, contractor and consultant (Song *et al.* 2009, Mosey 2009, Walker and Lloyd-Walker 2015).

1.2 Collaborative Management

According to Collaborative Management Tutorial (2018), Collaborative management can be defined as a collection of various management techniques that enlighten a sense of unity and teamwork among managers, supervisors, and the employees within a business organization. It can be broadly seen as the act of working together as a team to accomplish a common goal within a given timeframe.

The concept behind collaborative management style is to: allow managers to combine their strengths with the strengths of their team, make it possible to collectively overcome any weaknesses found among the team members, and enhance the efficiency and productivity of all the company.

1.3 Collaborative Approach in Problem Solving

One of the important objectives of the collaboration on any project is to solve disputes and taking effective and efficient decisions.

As applied to the organization, the collaborative problem solving model sets forth two major tenets: First, the problems are well understood in terms of the cause, the issue, and the bugs present (Rather than pointing out mistakes of the team members); second, these problems are best addressed by mutual discussions where everybody speaks and everybody listens (rather than showing superiority and trying to dominate other members).

Collaboratively resolving problems isn’t necessarily all that complicated, but it’s something for which the leaders need to have experience as well as patience, so it can take a while for all involved members to feel comfortable and keep their views open.

1.4 Collaborative Decision Making

The term collaborative decision making refers to processes in which autonomous or semi-autonomous actors interact through formal and informal negotiation, jointly creating rules and structures governing their relationships and ways to act or decide on the issues that brought them together” to achieve mutually beneficial interactions (Thomson *et al.* 2007).

It is very important to note that on any construction project, the management is as successful and powerful as its decision making based on the contract arrangement agreed-on for the particular project.

As mentioned earlier, executing construction projects with a traditional approach creates a separation between the design and construction processes. This separation is shown to hinder integration of knowledge between the technical consultant and the contractor, as well as diminishing the opportunity for contractors to get involved on the design decision.

The construction projects are highly subjected to changes or variations that need to be early assessed in a way to minimize them and/or solved in collaboration by all parties to contract. Any collaboration between project contractual parties helps to prevent delay of decision making and long-time disputes, helps to build good relationship and to achieve the timely delivery of the project. This needs to be a shared concept; in understanding and acting process to all contractual parties to the construction management team as whole.

1.5 Collaborative Project Delivery Forms

Partnering: The basics of partnering can be associated to a number of hard elements such as formal integrative mechanisms like workshops for team-building and common goals, financial incentive systems, dispute resolutions procedures and continuous improvements programmes (Bresnen and Marshall 2002, Nyström 2005, Eriksson and Westerberg 2011, and Bygballe *et al.* 2010). Additionally, as both a prerequisite and result of these integrative mechanisms trust and mutual understanding has an important place in partnering arrangements (Bresnen and Marshall 2002, Nyström 2005). Complementally, optional procedures like early involvement of contractors in concurrent engineering, joint project office and joint IT-tools can be adopted for increased partnering in a specific project (Eriksson and Westerberg 2011).

Two more distinct partnering approaches can be defined, namely project partnering and strategic partnering. In project partnering the different project parties agree on working collaboratively in a specific project (Rigby *et al.* 2009). Strategic partnering, on the other hand, is when a client (or contractor in that sense) works with a limited set of suppliers through a number of projects, with an intention to improve relations and performance over time (Rigby *et al.* 2009).

Relational contracting with early contractor involvement: The early contractor involvement (ECI) is a form of collaboration that originates from the ideas of partnering but with the goal to involve the contractor at an earlier stage through formal contractual mechanisms (Mosey 2009). It is a two-stage project delivery approach where the contractor is procured for two separate phases with open books. Figure 1 presents an overview of ECI compared to design-build and design-bid-build delivery forms from a construction project life-cycle perspective.

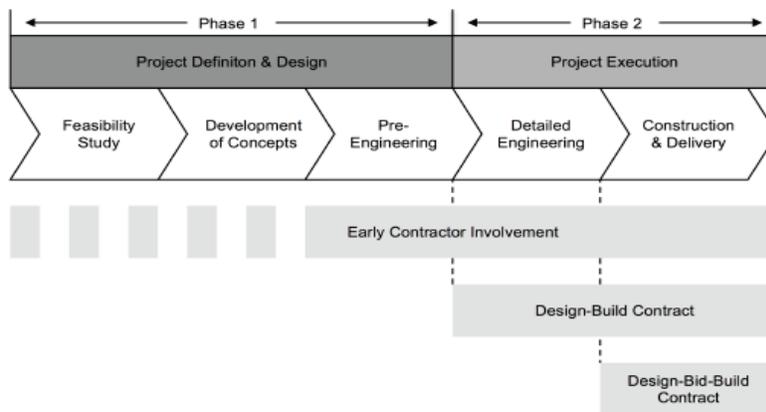


Figure 1. Construction project delivery activities in relation to different contract forms.

The point of time at which the contractor is awarded in an ECI project can vary depending on the project. The time of involvement ranges from the initial idea phase to the pre-engineering phase (Walker and Lloyd-Walker 2015). The range of work for the contractor, and the consultants, therefore, depends on the time of involvement of the contractor.

1.6 Opportunities and Challenges of Collaboration on Project Delivery

There is not a small number of advantages associated with collaboration on for delivery of any construction projects, including- Helping to develop a strong mind-set of best-for-project, building long-term relationship, achieving high performance and increased commitment in the project delivery, integration of knowledge and gain of experience, achieved constructability, avoidance of opportunistic behaviour, it enforces project parties to work together sharing both pain and gain; etc.

However, there are also the challenges associated to lack of proper integration of collaboration during project delivery, it includes: High level of project variations, increased number of disputes, cost overruns, project delays, poor quality delivered, long-term rivalry, etc.

2 METHODOLOGY

The Commercial Building Project mentioned in this article as an illustrative case study, provides a clear image about challenges of lack of collaboration during project delivery and advantages of adopting collaborative work for the best-for-project. This case study focused primarily on the execution stage, where complexity and novelty of processes are highest.

It is important to note that, one of authors was directly involved in the project management team as consultant quantity surveyor; which gives credit to genuineness of information and data analysis to be provided.

3 THE COMMERCIAL BUILDING PROJECT

3.1 Background

The new commercial building project is located in Rwanda, it comprises of six blocks with “U-shaped form; four blocks and two blocks have two and three floors respectively. As for the title, it is built for commercial activities. The building covers the surface area of 3,395m², and in total is 22, 650m² with a total cost of around two million dollars. The contractual approach adopted on this project was design-bid-build or traditional method of contract.

The client, a private woodwork cooperative, had the main objective of achieving low total operating costs over the lifecycle of the building. This included construction costs, costs for technical operation and maintenance of the building.

3.2 Project Challenges

Generally, this project suffered three major problems namely high level of variations, high cost-overruns and endless time extension resulting from poor integration of constructability principles and lack proper collaboration approach. Other causes included; poor project study, faulty, ambiguous, or defective working drawings; incomplete specifications; shortage of specialists in the consultant/design firm and lack of trust during project execution between parties on the contract.

According to Project Financial Appraisal As at 31st December 2013, the mentioned problems led to:

- 1) The contract price rise from 2,047,672\$ to 2,891,010\$. It equals the rise of construction cost is 41% (forty one percent) or 843,339\$. It is beyond allowable contract additional cost according to Rwanda Public Procurement Authority (RPPA) conditions of contract, which can only allow 15% rise for public projects. Fortunately, the client was a private developer.
- 2) *Disputes between all parties to the contract:*
 - ~ The client accused the contractor to delay the project as opposed to the contract agreement.
 - ~ The contractor also was accusing the design/consultant firm to be responsible of problems related to a big amount of variations occurred during execution resulting from undetailed, ambiguous, or defective working drawings; incomplete specifications and late of making decision to any available change.
 - ~ The consultant used to accuse the contractor to intentionally change the figure numbers of works executed during preparation of interim payments in order to obtain high payment.
- 3) *Endless extension of time.* Initially the project completion agreed-on in the contract was supposed to take place on 31 October 2013.

For the first time, in the site meeting of 24th September 2013 the contractor started to propose about time extension after realizing that the completion date agreed on in the contract will not be met. In the following site meetings both parties agreed to shift the completion time on 31st December 2013.

Latterly the works were not finished as on 31st December, negotiation agreed to place completion time on 28th February 2014, but the objective couldn't be met still. And finally, the project got completed by October.

3.3 How Collaboration Helped in Problem Solving

Despite challenges that occurred during execution of the Commercial Building Project rooting from improper planning and preparation of the project; there was a need to come up with a common problem solving approach namely the collaborative approach in problem solving. The following are important measures that were agreed-on by all parties for achieving that collaborative problem solving:

- 1) After realizing the high level of project variations in terms of design, cost and schedule, all parties to the contract (client, consultant and contractor) came to agreement of working together to re-work on the project financial appraisal. It as such decided in the way of integrating different knowledge to effectively and efficiently conduct the activity.
- 2) The second agreement was that at the end of each month of the contractual period, quantity surveyors of both the consultant and contractor parties had to work together to measure executed works to be paid in the interim payments. It properly replaced the former method whereby contractor quantifiers were the only supposed to measure the periodical executed work. That was such modified in order to prevent multiple checking of measurements by the consultant, which used to delay the approval of interim payments.
- 3) After facing the above-mentioned problems; the new collaborative agreement instructed the meeting minutes has to be checked and modified if necessary directly at the end of meeting and got signed by all parties to contract at the same meeting location. It is important to note here that the site meetings schedule changed from unplanned (or the

client or consultant instructs it) to planned schedule, at least once a week every Friday. This helped the evaluation and control of the schedule of activities.

- 4) The client agreed on providing bonuses to the contractor if he timely completes works based on the new project schedule. This motivated the contractor to raise commitment and achieve the high performance.

4 DISCUSSION AND CONCLUSION

The purpose of this article was to assess the role of effective collaboration for proper delivery of the construction project with an illustrative case to clearly draw the understanding of the literature. The collaboration model chosen for the Commercial Building Project was the scheduled meetings, working together by professionals from both parties during preparation of project financial appraisal interim payments, and finally provision of bonuses by the client. Even if the project was completed with all issues between parties not settled, however the adopted collaborative approach helped the integration of knowledge and gain of experience, reduced payment delay, achieve the proper evaluation and control of the schedule of activities and motivated the contractor to achieve high performance and efficiently complete the project.

Collaborative project delivery presents many advantages than challenges on any construction projects, especially when it is well organized and established from the early phase of the project. That is from project planning phase to project execution.

The effective collaboration between the various parties and the early involvement of the contractor are crucial for successful completion of both design and construction and the early integration of knowledge.

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