COMMUNICATION ISSUES IN DESIGN-BUILD PROJECT DELIVERY

Method

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Abstract: Design-Build (D-B) is a project delivery method in which the owner procures both design and construction services in the same contract from a single legal entity referred to as the design-builder. Having both design and construction in the hands of one contractual entity allows for a single point of responsibility and, in turn, provides improved project performance. There is a limited study on how communication among all parties involved influences the success of D-B projects. This paper investigates the modern-day communication issues that affect the D-B delivery method. A questionnaire was developed to collect data from professionals across the nation with an average of 22 years of experience related to D-B in commercial construction projects. The authors conducted five structured interviews to verify and validate the results from the survey questionnaire. The findings of this study indicate that the primary communication issues that have an effect on D-B are: (1) establishing the clear points of contact throughout the D-B communication process, (2) providing clear and understandable information among stakeholders during the D-B process and (3) the timely sharing of information to all stakeholders. It is recommended that further improvement strategies be implemented which include coordinating, clarifying, documenting and decision-making in order to better achieve project success. Understanding these communication issues will help professionals not only mitigate risk and uncertainty, but also enhance the likelihood of the success in D-B contracts.

1 INTRODUCTION

The design-build (D-B) project delivery method continues to grow as a viable delivery method in the construction industry. The Design-Build Institute of America (DBIA) reported that more than half of projects above $10 million are being completed using D-B project delivery (DBIA 2014). D-B has been used throughout the world for approximately 40 years (Lam et al. 2008) and its popularity has increased substantially over the last two decades.

A number of studies have investigated several topics related to D-B project delivery method in both building and transportation sectors. For example, studies have documented topics such as D-B performance (Konchar and Sanvido 1998), D-B evolution (Molenaar et al. 1999), D-B success factors (Chan et al. 2010), design-builder selection issues (Palaneeswaran and Kumaraswamy 2000), and impact of risk on D-B selection (Tran and Molenaar 2014) to name only a few. However, there is a limited study that focuses on the influence of communication issues on the D-B process. The objective of this study is to investigate the modern-day communication issues that affect the D-B delivery method in the building sector. This study defines communication in the D-B process as a two-way process of reaching mutual understanding in which participants impart or exchange information and ideas.
2 LITERATURE REVIEW

D-B is a project delivery method in which the owner contracts with a single entity to perform both design and construction. The single entity may be represented by a D-B firm with in-house design and construction teams or a joint-venture designer and contractor. Contractually, D-B offers the owners a single point of responsibility for design and construction service such as an overall project planning and scheduling (Konchar and Sanvido 1998).

The literature shows that D-B delivery method can bring about many benefits to a project. For example, in the building sector, the Construction Industry Institute (CII) has supported several studies that compare project delivery performance. Konchar and Sanvido (1998) defined a set of criteria for a performance comparison of different delivery methods, including D-B, a traditional design-bid-build (D-B-B), and Construction manager at Risk (CMR). They used a survey to collect post-project performance data from owners and contractors on 351 completed projects. The sample data consisted of a variety of project types and sizes (i.e., six different project types, project size varying from 500 to 200,000 m²). This study concluded that D-B performs better than D-B-B in terms of cost and schedule, and D-B performs better than both CMR and D-B-B in terms of quality. Another CII related study was conducted by Ibbs et al. (2003). This study compared cost growth, schedule growth and productivity between D-B and D-B-B based on 67 global projects from the CII database. The study concluded that D-B outperformed D-B-B in terms of schedule. However, D-B did not perform better than D-B-B in terms of cost growth and productivity in this sample.

Researchers showed that many factors impact the success of D-B projects. Chang et al. (2010) identified six project success factors for D-B delivery method, including project team commitment, contractor’s competencies, risk and liability assessment, client’s competencies, end-users’ needs, and constraints imposed by end-users. Lam et al. (2008) indicated that a clearly defined scope is vital for the success of a D-B project. Under D-B project delivery, the amount of information and the level of detail also play an important role in D-B contracts. Xia et al. (2012) showed that a sufficient amount of owner-provided design information should be provided in order to describe the owner’s requirements without compromising the potential for innovation.

The understanding and interpretation of the owners’ requirements along with communication between owners and design-builders was essential to the success of D-B projects. Adnan et al. (2012) pointed out that it is the responsibility of the design-builder team to provide care and attention to understanding the owners’ requirements. In addition, researchers claimed that communication is sometimes a problem in D-B contract due to the lack of contractual relationship between the owner and designers. Owners and design-builders need to have a proper and comprehensive checking and communication system to ensure the design is coordinated and construction complies with the design documents (Ling and Poh, 2008). One of the problems in D-B contract involved coordination issues arising from design and construction concurrence. Chang et al. (2010) concluded that further investigation into the coordination and communication issues resulting from the concurrence of design and construction is recommended.

A review of the literature indicated that although a number of studies have investigated the benefits of D-B projects, the overall D-B process, and D-B success factors, limited studies have explored the impact of communication on the D-B process. To fill this knowledge gap, this paper investigates the modern-day communication among all project participants involved corresponding to each of the typical phases in D-B delivery method.

3 RESEARCH METHODOLOGY

This study employed a survey questionnaire and interview methodology to examine the impact of communication on major phases of D-B projects. An online questionnaire survey was developed and distributed to 282 members of the DBIA Mid America region. The web-based software allowed for an anonymous link to be used and sent to potential participants. The use of this anonymous link was a requirement of the DBIA, because it allowed the responses of the participants to remain confidential. The
participants were divided into five different groups based on their roles in the D-B delivery method and the type of services their organization provided:

- **Owner Agency**: A private or public organization that advertises awards and supervises the design and construction of the project.
- **General Contractor**: The general construction contractor who physically completes the construction with its own forces and/or who holds the construction subcontracts.
- **Design-Build Firm**: An organization that has the internal capability to complete both the design and construction of a project.
- **Engineering/Design Firm**: An organization that completes the design portion of the D-B project prior to and during construction. This includes both architects and engineers.
- **Other**: This group includes specialty firms, consultants and educators that have experience with D-B.

The survey questionnaire included thirty-one questions that were either multiple choice or open-ended questions. The questionnaire consisted of three parts. In the first part, the participants were asked to read a series of definitions related to communication and the D-B delivery method. These definitions were necessary to establish uniformity in the participant’s interpretations and to avoid misunderstandings. The second part of the survey consisted of collecting the participant’s background information. The respondents were asked to describe which type of group or organization they worked for. They were also asked to provide their job title and their years of experience in the building industry. Finally, respondents were asked to provide their email information if they were willing to be available for additional follow-up questions. The third part involved D-B communication issues, which was divided into six different sections corresponding to the key phases in the D-B process as follows:

1. Request for Qualifications (RFQ)/Qualifications Statements;
2. Request for Proposal (RFP);
3. Design-Build Evaluation and Selection;
4. Design Development Phase; and
5. Construction Phase.

In addition to the survey questions, the authors conducted five structured interviews to verify and supplement the findings from the survey. These five interviews, including three with owners and two with design-builder firms were selected based on the responses from the survey questionnaire and their relevant D-B experience. During these interviews, the authors focused on the collection of empirical data by asking project-based questions.

4 RESULTS AND ANALYSIS

Out of the 282 professionals invited for the survey questionnaire, the authors received 59 completed questions. The response rate is 21%. On average, the respondents have more than 23 years of relevant experience. Figure 1 shows the percentage of survey responses associated with the different aforementioned groups. Figure 2 shows the participant experience on D-B project delivery method. The following sections briefly present communication issues associated with the five key phases in the D-B process resulted from the survey and interviews.
4.1 Request for Qualification and Qualification Statements

The owner’s requirements for offerors are defined and articulated in a RFQ either by in-house staff or by outside consultants (Beard et al. 2001). After the project is advertised and the RFQ has been issued, the potential design-builder teams submit their qualification statements. The qualification statement is a description of the design-build team’s composition and organization. To examine the communication issues regarding this phase, the questionnaire asked participants regarding what types of communication and clarification factors can affect their decision to pursue a D-B project. The survey results indicated that the content and presentation of RFQ is essential for D-B projects. Specifically, 38 out of 40 respondents (95%) agreed that the presentation of RFQ affected their decision to pursue the project. It is noted that 14 owner participants did not respond to this question. The completeness of RFQ documentation and how it is written to request the right information was a critical factor for design-build firms to submit their quantification statements. In addition, a number of respondents indicated that the
willingness of an owner to meet and discuss the project has a significant impact on their decision to pursue the project. Overall, almost all respondents indicated that they would like to receive more clear and understandable information, timely responses to their questions, and discuss the project with the owner or owner’s representative directly. The results from the structured interview confirmed this finding. One of the interviewees, who works for a General Contractor firm, stated that “sometimes the owner doesn’t provide any information on the project itself that significantly hinders their decision on submitting the qualification statement.”

The owner participants were asked what types of communication and clarification factors influence their decision to select or “short-list” a design-builder for a project. Out of 14 owner participants, nine (64%) stated that clarity, readability and technical approach of the qualifications statement was the primary selection factors. The owner representative in the interview process confirmed that “they selected the shortlisted design-builder based on their ability and clarity in their statements of qualification that demonstrate the understanding of a given D-B project requirement.”

4.2 Request for Proposal

Design and cost proposals are solicited from the shortlisted design-builders in an RFP. Among the items found in a typical RFP are project design criteria, program requirements, performance specifications, site information, contract requirements, selection procedures, and proposal requirements or deliverables. The survey questions were developed to investigate the impact of communication between the owner and proposer on the D-B solicitation process.

Almost all respondents (81%) agreed that developing a clear, comprehensive and well-defined RFP is a critical success factor for D-B projects. However, six respondents (10%) slightly disagreed and five respondents (8%) disagreed that they received RFPs that clearly and comprehensively describe and the owner’s needs and requirements. The survey results also indicated that it is important to enhance communication between the owner and proposers during the solicitation process. In addition, the participants were asked how communication and coordination issues can be improved during the solicitation process. The main responses (66%) involved documenting questions and answers/clarifications and provided them in a timely manner. One contractor in the interview stated that understanding the selection criteria and how the project would be awarded was the essential for his firm to compete for the project. This participant also emphasized that his firm sometimes received RFPs that were not clear in the scope and they need to make assumptions and interpretations. His concern is that each proposer may interpret the RFP differently and the final comparisons would not be fair and transparent. Another contractor in the interview pointed out that “the timeliness of responses, lack of response, clarity of the responses and the time allowed for asking and answering questions were their primary concerns” during the solicitation process. Another interviewee, who works for a public owner, believed that there is some confusion regarding the final decision makers among the owner’s representatives. He stated that sometimes this causes issues because the design-builder does not know who to speak with or get decisions from.

4.3 Design-Builder Evaluation and Selection

Once received, proposals are evaluated on the basis of quantity, quality, functional efficiency, aesthetics, price and other factors (Beard et al., 2001). Compared to Design-Bid-Build (D-B-B) projects, it is more difficult to evaluate D-B tenders because of the need to evaluate both price and design (Ling and Poh, 2008). Effective communication is an integral part of the D-B evaluation and selection process.

Out of 59 respondents, 51 (86%) agreed that a well-established evaluation system along with a guideline for how to use it would be critical for selecting a design-builder. However, eight respondents slightly disagreed that they always received the guidelines for the evaluation process. The participants were also asked whether or not the level of communication between the owner and the proposer during the selection process was insufficient in need of improvement. Twenty eight respondents (47%) believed that the level of communication in their projects were sufficient while 31 respondents (53%) indicated that the level of communication between the owner and proposers need to improve. These 31 respondents suggested several approaches to improve communication between all parties involved in the selection
process. The main theme involves increasing the number of meetings to resolve confusion, especially face-to-face meetings, and specifying the right point of contact during the selection process. With the prolific use of online communication, many respondents would like more face-to-face meetings during the selection process as they believe this would help with communication during the process.

In the structured interview, a participant from a design-build firm stated that “email is a distribution device and not a communication device and the face-to-face meetings are very important in the design-builder evaluation and selection process.” This interview also mentioned that all project information needs to be clear and in writing, especially meeting minutes. Documenting and understanding which information is available to share during the evaluation process is very important. The interviewee stated that “many of the design-builders and general contractors felt that during the evaluation process, there should be clear instructions on what will or will not be shared with competitors.”

4.4 Design Development Phase

After a design-builder is awarded the contract, a notice to proceed with the design work is issued by the owner. In accordance with the design-builder’s proposal and the owner’s comments, the team proceeds to develop more detailed architectural and engineering documents, often in close coordination with representatives of the owner and local building code officials (Beard et al. 2001). Communication is sometimes a problem because once the D-B contract is awarded, owners may be out of the loop if all design and construction decisions and tradeoffs are internal to the design-build team and do not involve the owners (Ling and Poh 2008).

In this phase, the participants were asked to explain the impact of communication on solving conflicts in design between the owner and design-builder. The survey results indicated that 25 respondents (42%) agreed that there was insufficient communication between the design-builder and owner to solve design issues occurred during the design development phase. The common theme of these responses is that the majority of projects only have one meeting between the owner and design-builder during design. This finding is consistent with the literature. The researchers showed that there is insufficient communication between the owner and the design-builder team because of the absence of a contractual relationship between owners and the design-builders’ design consultants, subcontractors and suppliers In fact, owners may be concerned that exclusion from the D-B team discussions may compromise project quality (Ling and Poh 2008).

The respondents also agreed that enhancing communication between the owner and design-builder and timelines for approvals were important to solve any potential design conflicts. Forty five respondents (76%) showed that they preferred to have a weekly meeting between the owner and design-builder during the design development phase. Figure 3 illustrates the different methods of communication. One can observe from Figure 3 that email, face-to-face meeting, and phone conversation are common communication methods in the design development process.
The respondents also indicated that allowing direct communication and using multiple methods of communication would be helpful in solving design issues. One of the interviewees agrees that the single-contract basis of D-B almost always limits any communication too strictly between the owner and design-builder entity. This fact makes the communications process extremely linear in both directions and limits the flow of project information.

The participant was also asked for the challenges of coordination and communication during the design phase in a D-B project, and some of the strategies to overcome such challenges. The major challenges included (1) timely and understandable decisions by the owner's group; (2) meeting owner design expectations; (3) timely and successful sharing of information. The main strategy to overcome these challenges involved establishing a centralized information storage and sharing system to ensure effective communication between the owner and design-builder.

4.5 Construction Phase

For D-B projects, construction can begin prior to design completion. When the owner approves the construction documents for all elements or for specific parts of the work, construction can start (Beard et al. 2001). During construction the owner's representative will monitor the work for quality and degree of completion. After the completion of construction, the owner's representative will examine the facility for compliance with the initial program and performance requirements, as well as with the design-builder's proposal and its construction documents (Lam et al. 2008). Similar to the design development phase, 43 respondents (73%) showed that they preferred to have one meeting per week between the owner and design-builder during the construction phase. Additionally, communication methods such as email, face-to-face meeting, and phone conversation are common in the construction phase. Figure 4 shows the different communication methods resulted from the survey.
To investigate further the impact of communication on the construction phase, all participants were asked to identify the challenges of coordination and communication during the construction phase in a D-B project, and the strategies to overcome such challenges. The typical challenge involved timely and successful sharing of information among all project participants in the construction phase. One contractor in the interview process stated that when questions are not asked, assumptions are made which can result in incorrect information being assumed. When answers are not given in a timely manner, the lack of response can affect the proposal, design and/or construction. The contract discussed that “more and more D-B projects are being done because they save time. Response time should be fast. Owners understand the need for responsiveness, but don’t always behave the way that would be best.”

The typical strategy to overcome such challenges is to enhance communication between the owner and design-builder. The survey results showed that 45 responses (76%) agreed that one meeting between the owner and design-builder per week appears to be the standard during the construction phase. In addition, the design and construction teams need to communicate clearly and understandably to one another though they are one team during construction.

5 CONCLUSION

This paper examines the communication issues during each typical phase of D-B projects. The survey questionnaire and follow-up interviews were employed to collect data in the building sector. The results suggested that the primary communication issues that have an effect on D-B include: (1) establishing and meeting with the clear points of contact and decision makers throughout the D-B process, (2) providing clear and understandable information among project participants involved, and (3) and the timely and successful sharing of information. In addition, the results suggested that coordination, clarification, documentation of relevant information in each phase of the D-B process is essential to the success for D-B projects. These findings furnish stakeholders with an understanding of the communication issues that are occurring in D-B. These findings also deepen the current body of knowledge and serve to enlighten professionals regarding D-B communication issues.

There are several limitations to this study. First, the survey questionnaire was only sent to the members of the DBIA Mid America region. It is expected that the accuracy and validity of the finding will increase if
the survey was nationwide distributed. Second, while the response rate of the survey questionnaire was adequate to determine the major communication issues, an increased response would enhance the verification and validation process. Finally, the follow-up interviews included only five participants. Additional interviews can provide more data and input to augment the findings for this study. It is recommended that future studies should seek additional industry input as well as conduct case studies in order to better document how the communication issues affect the D-B delivery method.

References


