

## **Searching for Success in Design-Build Projects – A Qualitative Survey of 23 Practitioners**

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### **Abstract**

Success is an abstract expression which means different things to different people. With the wider application of procurement alternatives to construction projects, industry practitioners have shown more concerns on the success criteria of the alternative procurement systems, like Design-Build (D&B). This paper investigates how ‘success’ is defined and achieved in design-build projects. It first provides a summary of the literature review on project success for design-build projects. An empirical study has also been carried out with twenty-three D&B practitioners in Hong Kong to further identify the criteria and factors critical for the success of D&B projects in practice. Key findings from the structured interviews indicate that the success criteria and critical success factors of D&B projects are similar to those of a construction project in a generic sense. The study is considered exploratory to reaffirm the attributes of D&B project success in literature on which the framework of the questionnaire is based. While the interim findings were delivered for the research of D&B project success in Hong Kong, further extensive research on the quantitative analysis of the success criteria and critical success factors for D&B projects is envisaged to be undertaken for achieving a successful project delivery process.

### **Keywords**

Project Success, Critical Success Factors, Procurement, Design-Build, Hong Kong

### **1. Introduction**

Construction projects have long been procured by the traditional design-bid-build method in which the architect designs and the contractor constructs. In order to meet the client’s requirements, researchers and practitioners have established various standards and criteria to assess whether a completed project can be considered a success or failure. In fact, construction is a complex activity which involves different parties with different perspectives on the definition of success. While time, cost and quality have still been considered the ultimate criteria for success measurement, Stevens (1996) classified the success criteria for a construction project into the ‘hard’ and ‘soft’ categories. With the increasing use of

alternative procurement systems, participants have shown concerns on developing success criteria for the non-traditional methods, such as Design-Build (D&B).

Project success is attributed to a number of critical factors (Beale and Freeman, 1991). Therefore, the identification of critical factors can increase the chance of project success. Various research has been conducted on the project success for construction projects in a generic sense (Beale and Freeman, 1991; Chua et al., 1999). However, building clients have shown considerable dissatisfaction on the separated procurement system (Molenaar and Songer, 1998). The increasing use of D&B indeed prompts a need to search for the critical success factors for such procurement alternative.

The paper is divided into four parts. It first outlines the methodology for the research. Then a summary of the success criteria and critical success factors of design-build projects is presented. Key findings from the structured interviews with twenty-three D&B practitioners in the construction industry of Hong Kong are also provided to identify the success criteria and critical success factors of design-build projects from their hands-on experience. The paper will be concluded with further recommendations on the quantitative analysis of the survey on D&B project success.

## **2. Methodology**

The research disseminates the findings of an interim report of the study on project success for D&B projects. It was conducted by means of literature survey and structured interviews. Such method has been applied by Lam et al. (2003a) in determining the reasons for the wider adoption of D&B in the public sector and Lam et al. (2003b) in investigating the misuses of D&B. The method has also been adopted in evaluating the perceptions on the D&B method from the viewpoints of stakeholders and comparing the merits and demerits of the D&B method (Lam et al., 2003c; Lam et al., 2003d). Literature of some high-ranked journals, books and conference proceedings in the construction management field was searched for success criteria and critical success factors of running D&B projects. A summary of the previous research work of the authors on the desk study of project success for D&B projects was also outlined to enrich the literature search.

Structured interviews with twenty-three D&B participants in the construction industry of Hong Kong were carried out to collect empirical data for the research. The interviewees were contacted in December 2001 and interviews took place from December 2001 to June 2002. A list of interview questions were also attached to the letter of invitation to ask the D&B participants for their opinions on the success criteria and critical success factors for D&B projects. While previous work on D&B was conducted with a comprehensive desk study and interview surveys on the general perceptions of participants, this research summarizes the literature review and quantifies the qualitative findings to differentiate the responses of the project participants to obtain the relative importance of the attributes.

## **3. Defining Project Success in Design-Build Context**

Success is abstract in terms of definition, but it is the expected outcome of every business entity. The client, contractor and various consultants also collaborate and work with each other in construction projects towards project success. Chan et al. (2002) have observed a change in the success criteria for measuring project performance over the past ten years. While the design-build (D&B) procurement alternative has been increasingly used to overcome some of the problems associated with the traditional system, there is concern among both researchers and practitioners in the industry about the criteria for judging success

of D&B projects. Songer and Molenaar (1996) advocated on budget, on schedule, meeting specifications, conformance to user's expectations, high quality of workmanship and minimizing construction aggravation as criteria of success for D&B projects. Chan et al. (2002) later provided a comprehensive desk study on the framework of success criteria for D&B projects. The meaning of each criterion measurement has also been demonstrated so that project participants can assess whether a D&B project is a success or failure.

While success is the result of a construction process, it is necessary to determine the factors that lead to the ultimate outcome of the D&B project. Previous researchers considered a clear brief, a greater level of managerial expertise from the contractor and a well-organized and cohesive team as factors critical for D&B project success (Pearson and Skues, 1999; Rowings et al., 2000). Lam et al. (2003e) explored the meaning of critical success factors (CSFs) in the construction context and identified various CSFs to benchmark the D&B method in construction, namely Project characteristics, Project procedures, Project management strategies, Project-related participants, Project work atmosphere and Project environment. Moreover, the findings suggested that the factors are interrelated with each other, and the results are in turn determined by a number of sub-factors or attributes.

#### 4. Participants' Perspectives on D&B Project Success

Literature survey provides a comprehensive knowledge base for the study of project success for D&B projects. To further explore the success criteria and critical success factors for D&B projects, an empirical study has been conducted with twenty-three D&B participants in the Hong Kong construction industry and the details are shown in Table 1.

**Table 1: Demographical Data of the Interviewees**

Ref. No.	Group	Project Types Involved
Cl1 – Cl10	Client	Residential, Godown, Hospital, Slaughterhouse, Government Headquarters, Fits-out
Ctr11 – Ctr18	Contractor	Residential, Office, Maintenance Depot, Slaughterhouse, Hospital
Cot19 – Cot23	Consultant	Residential, Slaughterhouse, Office, Hospital

##### 4.1 Success Criteria for Design-Build Projects

Respondents were asked for their opinions on the success criteria for D&B projects and the findings are illustrated in Table 2.

Most respondents consider time, cost and quality as important criteria to measure success for D&B projects. They also believe that the criteria for judging success of construction projects in generic sense are also applicable to D&B projects. Some client interviewees expressed their concerns on the satisfactory level of project participants, including end-users (e.g., Cl16, Cl17) while the contractor interviewees considered the standards for tender assessment seriously as the success criteria, such as the site safety plan, the quality of environmental protection plan and waste management plan (Ctr12, Ctr15). The award from the public sector client on environmental issues can also be an indicator for including environmental friendliness as one success criterion (Ctr14). The number of disputes and the time taken for settling the final account have also been considered as important measures for D&B project success from the participants' points of views (e.g., Cl1, Ctr18, Cot19).

**Table 2: Success Criteria for Design-Build Projects**

<b>Respondents</b>	<b>Criteria for construction projects in general</b>	<b>Time</b>	<b>Cost</b>	<b>Quality</b>	<b>Satisfaction</b>	<b>Dispute-free</b>	<b>Safety</b>	<b>Environmental friendliness</b>	<b>Aesthetics</b>	<b>Fulfillment of client's requirements</b>	<b>Ability to generate profits</b>	<b>Educational purpose</b>	<b>Functionality</b>
Clt1	x	x	x	x	x	x							
Clt2	x	x	x	x	x								
Clt3	x						x	x	x				
Clt4	x												
Clt5	x	x	x	x									
Clt6		x	x	x	x	x							x
Clt7	x	x	x	x	x								
Clt8	x	x	x	x	x		x	x	x				
Clt9	x	x	x	x	x		x	x		x			
Clt10		x		x		x							
Ctrl1	x												
Ctrl2		x		x			x	x					
Ctrl3	x												
Ctrl4		x	x	x	x			x	x				
Ctrl5		x	x	x	x	x	x	x	x			x	x
Ctrl6		x		x	x			x	x	x	x		
Ctrl7	x	x	x	x			x		x				x
Ctrl8	x	x	x	x		x							
Cot19		x	x	x	x	x	x	x					
Cot20	x	x	x	x	x			x	x				
Cot21	x	x	x	x									
Cot22		x	x	x					x				
Cot23	x	x	x	x				x	x				x
Total	15	19	16	19	11	6	7	10	9	2	1	1	4

**4.2 Critical Success Factors for Design-Build Projects**

While there is a general agreement on the success criteria for D&B projects among clients, contractors and consultants, the critical success factors suggested by the D&B project participants are rather varied and diversified (Table 3).

There is unanimous view among the respondents that the experience of participants managing D&B projects is one critical success factor for D&B projects. The respondents also consider the clear brief and teamwork as important success factors for D&B projects. The client interviewees believe that the contractor should well understand the change of roles in D&B projects in the proper planning of the sequence of the design and construction works (e.g., Clt1, Clt4). He should be experienced enough to maintain a proper budget for the D&B project, as suggested by Clt3, Clt4, Clt5. One client respondent claimed that the management of D&B projects is similar to that of construction projects in a generic sense, except the design management which requires close coordination among project participants (Clt10). Some contractors highlighted the change of mindset of participants as one critical success

factor so that all project parties can work towards the goal of the D&B project (e.g., Ctr11, Ctr12). The consultant interviewees placed more emphasis on the management and supervision for the D&B project (Cot19, Cot23).

**Table 3: Critical Success Factors for Design-Build Projects**

Respondents	Participants' knowledge on the roles in D&B	Project characteristics (clear brief, degree of flexibility in project)	Mindset of project participants	Experience of managing D&B projects	Project environment (physical factors, industrial relations)	Teamwork	Coordination among project participants	Stable financial background of the contractor	Effective management strategies and control measures	Fair contractual provisions	Support from the Company (resources)	Effective design approval procedures
Cl1	x			x		x		x				
Cl2		x		x						x		
Cl3			x	x						x		
Cl4				x		x		x	x			
Cl5	x	x		x		x						
Cl6			x	x		x						
Cl7		x	x	x					x	x		x
Cl8	x	x		x	x	x			x		x	
Cl9	x			x		x			x			
Cl10				x		x	x					
Ctr11	x	x	x	x		x	x					
Ctr12		x	x	x	x	x			x			x
Ctr13		x		x			x			x	x	
Ctr14	x	x	x	x	x	x			x			
Ctr15	x	x	x	x		x			x			
Ctr16	x	x		x	x	x	x		x		x	
Ctr17		x		x		x			x			x
Ctr18		x		x		x			x			x
Cot19		x		x		x			x	x		
Cot20				x		x						
Cot21		x	x	x								x
Cot22	x			x								
Cot23		x		x		x	x		x			x
Total	9	15	8	23	4	17	5	2	12	5	3	6

## 5. Conclusions

D&B has been increasingly used over the world to procure construction projects and practitioners show concerns on the criteria and critical factors to determine the successful execution of such alternative procurement system. This research provides a comprehensive literature base and an empirical study on the topic of project success for D&B projects. Major findings suggest that the success criteria and critical success factors of D&B projects are similar to those of construction projects in a generic sense. This study reaffirms the findings from literature for later research works and a larger sample size is expected to differentiate project success of the D&B method from the conventional method. While only interim

findings were delivered, further research should be focused on the quantitative analysis of the success criteria and critical factors so that the participants of D&B projects can allocate resources accordingly.

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