

Contractor's Selection Criteria in Construction Works in Pakistan

Noor ul Islam Soomro

Department of Civil Engineering
Mehran University of Engineering and Technology Jamshoro
Sindh, Pakistan
noorsoomro93@gmail.com

Nafees Ahmed Memon

Department of Civil Engineering
Mehran University of Engineering and Technology
Jamshoro Sindh, Pakistan
nafees.memon@faculty.muett.edu.pk

Aftab Hameed Memon

Department of Civil Engineering
Quaid-e-Awam University of Engineering, Science and
Technology, Nawabshah, Sindh, Pakistan
aftabm78@hotmail.com

Kashif Rafique Memon

Department of Civil Engineering
Mehran University of Engineering and Technology
Jamshoro Sindh, Pakistan
kashif.memon33@gmail.com

Abstract—The contractor is the primary stakeholder in materializing a project concept. For the successful completion of any project, it is compulsory for the contractor to have relevant experience. The selection of the appropriate contractor depends on various criteria. This study aims to study these selection criteria. Based on 71 questionnaire forms received from representatives of contractor, consultant and client firms involved in execution works of construction activities it is found that quality, bid amount, technical capability, financial stability, and experience are five commonly adopted criteria for contractor selection in construction works in Pakistan. On the other hand, quality, technical capability, financial stability, equipment availability, and management capability are reported as the top five effective criteria for appropriate contractor selection for any construction project.

Keywords—contractor selection; selection criteria; Pakistan; Sindh; construction works

I. INTRODUCTION

The success of a project depends on the performance of the contractor, hence its selection is essential. The selection of the right contractor reduces cost while assuring high quality work [1]. A research carried out in Hong Kong identified five critical factors for project success: initiation and transmission of conflict resolution, energy, resource sharing among project participants and responsibilities have been defined clearly [2]. In traditional contracting, the contractors are mostly selected based on lowest bid criterion which often results in declination of quality, cost, and completion time of the project. Thus, it is essential to select a suitable contractor for the project for achieving effective performance and successful completion. This paper focuses on studying the contractor selection criteria adopted in construction works in Pakistan. This paper identified the level of adoption for selection criteria of contractors and the level of effectiveness of each criterion. The level of adoption references to the occurrence, i.e. how

common each criterion is used in construction industry, while the level of effectiveness defines the importance of the criteria.

II. CONTRACTOR SELECTION CRITERIA

For the success of any construction work, contractor selection is very imperative phase. A selection criterion is involved in judging and measuring the potential of contractors. The skills of contractors are judged and calculated. Some common criteria considered in contractor selection are:

- Technical capacity: Contractors must have the capability of completing project activities successfully [3].
- Experience: Experience plays an important role in performing any task with ease and perfection. Hence, it is essential to select the contractor based on its relevant work experience in past [3].
- Management capacity: Planning, organizing and handling of project express the management capability of the contractor [3].
- Financial stability: Overall financial position and capability must be examined based on the cash flow of the contractor [3].
- Past performance: Past performance should be considered for time, quality, and cost control requirements [4].
- Past relationship: Clients need to gather all the information regarding the contractor and evaluate its past affiliation which contributes in construction activities [4].
- Reputation: Project manager must have an opinion about the contractor's past performance and reputation regarding the success in projects' completion [4].
- Occupational health and safety: Contractors must apply occupational health and safety principles [3].

Corresponding author: Noor ul Islam Soomro

- **Quality:** The contractor must be capable to maintain the desirable quality standards [3].
- **Organizational skills:** Focus on the effective utilization of the required resources with teamwork creating environment for team work while directly reduce the level of individual stress.
- **Current workload:** It refers to the present workload of the running project [3].
- **Equipment:** It should be ensured that the contractor has the sufficient equipment required for the project [6].
- **Human resources:** Human resource management deals with employee selection, recruiting, providing orientation, training, and development, appraising employee performance, motivating employees, deciding compensation, and ensuring safety, welfare, health and incompliance with labor laws [6].
- **Project-specific requirements:** They are some specific requirements necessary to ensure the specific project's success. They are meant to align the project resources with the objectives of the owner. The benefits of collecting project requirements include cost reduction, higher project success rate, enhanced stakeholder communication and effective management of change [5].
- **Business location:** The location of a business is the place where it is situated and it refers to the nearby locations where all the requirements can be achieved successfully.

The owner should look at the advantages which each area has to offer [5].

- **Bid amount:** It is colloquially known as a "Bid" in markets, and is often lower than the asking price [4].

If the contractor is technically sound and has adequate experience, equipment availability, and personnel to satisfy the client, it can achieve the successful completion of the project. Further, the financial soundness of the contractor may help to achieve the best quality and project success within the desired time. If the contractor management capability is high, then it is easy for the contractor to deal with technical personnel with experience, quality, and management and project management capabilities. If the contractor's reputation is high then past performance and past relationships are considered by the clients making the contractor favorable for more awarding contracts. The selection of a suitable contractor is the key to project success by awarding the contracts to the lowest price with multi-criteria selection practices. Both technical and financial criteria are considered in a multi criteria process. Most changes occur by local official authorities and are useful for maintaining construction quality. A study of Gaza strip showed that central bidding committee provides a fair bid evaluation process, with equal opportunities to all bidders, and suitable responsibility [4]. Authors in [3] revealed that financial soundness, technical ability, management capability and health and safety are major criteria for selecting a contractor. Various researchers have highlighted different criteria for selecting the appropriate contractor as shown in Table I.

TABLE I. CONTRACTOR SELECTION CRITERIA

	[3]	[4]	[5]	[6]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]	[19]	[20]
Experience	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
Technical capability	✓	✓	✓				✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
Financial stability	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Management capability	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓		✓	✓
Past relationship				✓						✓						✓	
Past performance		✓	✓	✓	✓	✓				✓	✓	✓		✓	✓	✓	✓
Occupational health and safety	✓	✓	✓	✓	✓		✓	✓	✓		✓	✓	✓		✓	✓	✓
Reputation			✓	✓			✓			✓			✓	✓		✓	
Organizational skills		✓				✓						✓			✓		
Quality	✓		✓	✓	✓			✓	✓	✓	✓				✓	✓	
Environmental aspects											✓						✓
Current workload	✓		✓											✓			
Equipment		✓															
Human resources/ managerial resources		✓	✓													✓	✓
Project-specific requirements			✓						✓								
Business location			✓														
Bid amount				✓									✓			✓	

III. DATA COLLECTION AND ANALYSIS RESULTS

The data for this study were gathered through a survey amongst construction practitioners. Out of 120 sent survey forms, 71 were received from various professionals in relevant fields. Prior to the analysis of the gathered data, the reliability of the data was assessed by Cronbach's alpha computed with statistical software package SPSS. Cronbach's alpha for the level of adoption of the criteria is 0.949 while the alpha for the level of effectiveness is 0.859. The value of alpha for adoption

level and level of effectiveness are higher than 0.7 (the alpha value is considered satisfactory if it is greater than 0.7 [7]), hence, the data are considered reliable and can be considered for further analysis and drawing conclusions. The forms were analyzed statistically and the results are discussed below.

A. Respondents Profile

The respondents participating in the survey had strong technical profile and were employed in the construction sector. The characteristics of the participants are summarized in Table

II, from which it can be observed that the majority of the participants (33 out of 71) are representatives of client firms while at the second level, 24 participants are engaged in contractor companies, and 14 participants are working with consultants. Among these respondents, 36 have completed civil engineering education, 26 have finished a Master, 6 have a diploma, while 3 are PhD holders. These respondents are working for several years in construction works with experience spanning from less than 5 years (49) to more than 20 years (5). Among these participants, 13 are involved in project executions with contract sum above Rs. 3000M, 14 are working in projects costing Rs. 400M to 3000M and the other practitioners are working in projects costing below Rs. 400M. Eight participants are directors of their companies, 11 are working at a managerial level, 28 are resident and planning engineers, while 24 respondents are site supervisors and site engineers.

TABLE II. PROFILE OF RESPONDENTS

	Frequency	Percent	Cumulative percent
Organization type			
Consultant	14	19.7	19.7
Contractor	24	33.8	53.5
Client	33	46.5	100.0
Education level			
Diploma	6	8.5	8.5
Degree	36	50.7	59.2
Master	26	36.6	95.8
PhD	3	4.2	100.0
Experience level			
0-5 years	49	69.0	69.0
06-10 years	9	12.7	81.7
11-15 years	5	7.0	88.7
16-20 years	3	4.2	93.0
21-25 years	2	2.8	95.8
more than 25 years	3	4.2	100.0
Project size (Rs.)			
Less than Rs. 20M	18	25.4	25.4
20M - 50M	16	22.5	47.9
50M - 150M	4	5.6	53.5
150M - 400M	6	8.5	62.0
400M – 800M	8	11.3	73.2
800M – 1800M	5	7.0	80.3
1800M – 3000 M	1	1.4	81.7
Above 3000M	13	18.3	100.0

B. Level of Adoption of Contractor's Selection Criteria

The participants responding in the survey process were required to rate the adoption level of various criteria of contractor's selection considered by their respective companies. The respondents were asked to indicate the level of adoption using a 5 point scale where 1=never, 2=sometimes, 3=moderately, 4=usually and 5=always. Mean value, standard deviation, and ranking obtained from statistical analysis of the data collection for these criteria are presented in Table III. It can be seen that quality with mean value of 3.90 and standard deviation 1.232 is reported as the most commonly adopted criterion and is ranked first by the participants. Bid amount with mean value of 3.87 and standard deviation 1.120 is placed

second and technical capability is third with a mean value of 3.87 and standard deviation 1.170. The participants were also asked to mark the level of effectiveness of all these criteria.

TABLE III. CONTRACTOR SELECTION CRITERIA ADOPTION LEVEL

Contractor selection criteria	Frequency for scale					Mean	S.D	Rank
	1	2	3	4	5			
Quality	6	3	12	21	29	3.90	1.232	1
Bid amount	3	6	13	24	25	3.87	1.120	2
Technical capability	3	8	11	22	27	3.87	1.170	3
Financial stability	4	8	14	18	27	3.78	1.229	4
Experience	8	13	4	13	33	3.70	1.487	5
Past performance	3	10	14	23	21	3.69	1.166	6
Equipment	4	12	10	27	18	3.60	1.200	7
Management capability	3	11	17	22	18	3.57	1.154	8
Reputation	5	9	17	21	19	3.56	1.215	9
Organizational skills	5	9	17	21	19	3.56	1.215	10
Project-specific requirements	3	13	16	23	16	3.50	1.157	11
Human resources/managerial resources	6	14	14	19	18	3.40	1.293	12
Current workload	7	11	19	18	16	3.35	1.266	13
Environmental aspects	8	12	17	18	16	3.30	1.304	14
Occupational health and safety	7	11	24	15	14	3.25	1.227	15
Business location	7	15	16	22	11	3.21	1.229	16
Past relationship	5	16	21	20	9	3.16	1.133	17

TABLE IV. EFFECTIVENESS LEVEL OF CONTRACTOR SELECTION CRITERIA

Contractor selection criteria	Frequency for Scale					Mean	S.D	Rank
	1	2	3	4	5			
Quality	4	2	17	18	30	3.95	1.139	1
Experience	6	3	11	19	32	3.95	1.247	2
Technical capability	4	10	11	17	29	3.80	1.271	3
Financial stability	5	8	9	24	25	3.78	1.241	4
Equipment	4	7	12	26	22	3.77	1.161	5
Management capability	2	8	17	23	21	3.74	1.091	6
Bid amount	3	8	15	27	18	3.69	1.103	7
Reputation	3	7	22	20	19	3.63	1.111	8
Current workload	4	8	15	28	16	3.61	1.125	9
Past performance	3	11	15	24	18	3.60	1.152	10
Organizational skills	2	11	18	23	17	3.59	1.102	11
Project-specific requirements	3	8	20	28	12	3.53	1.039	12
Human resources/managerial resources	5	10	16	24	16	3.50	1.193	13
Past relationship	4	13	25	20	9	3.23	1.075	14
Business location	4	16	20	21	10	3.23	1.127	15
Occupational health and safety	4	17	18	22	10	3.23	1.139	16
Environmental aspects	6	15	17	23	10	3.22	1.185	17

The respondents were asked to indicate the level of effectiveness using a 5 point scale as 1=not effective, 2=less effective, 3=moderately effective, 4=very effective and 5=extremely effective. Analysis of the data was performed with mean value and standard deviation calculation and is presented in Table IV. It can be seen that that quality with mean value of 3.95 and standard deviation 1.139 is reported as the most effective criterion, with technical capability and financial

stability following with mean value of 3.8 and 3.78 respectively. Equipment availability and management capability were at the fourth and fifth place.

IV. CONCLUSION

This paper focused on highlighting the contractor's selection criteria adopted in construction works in Pakistan. This aim was achieved through a survey of construction practitioners using a form based on 17 criteria identified in the literature. Mean value and standard deviation analysis of the 71 survey forms received revealed that quality, bid amount, technical capability, financial stability and experience are common criteria adopted in construction projects of Pakistan for selecting the most appropriate contractor. The study also highlighted that quality, technical capability, financial stability, equipment availability, and management capability are the most effective criteria for selecting a contractor for any construction project. The findings of this study will be very useful for consultants and clients in order to select a suitable contractor for construction works.

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