

Critical Factors Influencing the Bid/No Bid Decision in Pakistan Construction Industry

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Abstract. In construction industry, adequate and effective decision-making can mean the difference between success and failure. Bidding is the most important element of construction business since it is a mean by which contractors obtain work. This is probably the only option for any contractor firm to sustain in the market and achieve its objective of earning the profits by winning tenders. The capability to select most appropriate ventures not only defines the success and wellbeing of a contractor firm, but even its survival and sustainability in the industry. This research has been opted considering the local construction industry of Pakistan in order to examine the critical success factors from contractors' perspective while making bidding decisions, listing and evaluating critical factors in order of their importance. Literature review and questionnaire are used for identification and quantification of factors affecting bid/no bid decision-making. Statistical methods of ranking analysis were used for analysis. It is found that profitability, need for work and financial health of client are the most decisive factors in bid/no bid decision-making while project size, project type, fulfilling the tender conditions imposed by the client and relationship, identity & reputation of client are least impact factors in bid/no bid decision-making.

Keywords: Bidding, Bid decision-making, Construction procurement, Contractor.

1 Introduction

According to the Pakistan bureau of statistics, the contribution of the construction industry to the GDP of Pakistan increased from 2.34% in 2013 to 2.58% in 2016. Construction sector is considered to be a basic industry on which the development of the country depends to a larger extent [1].

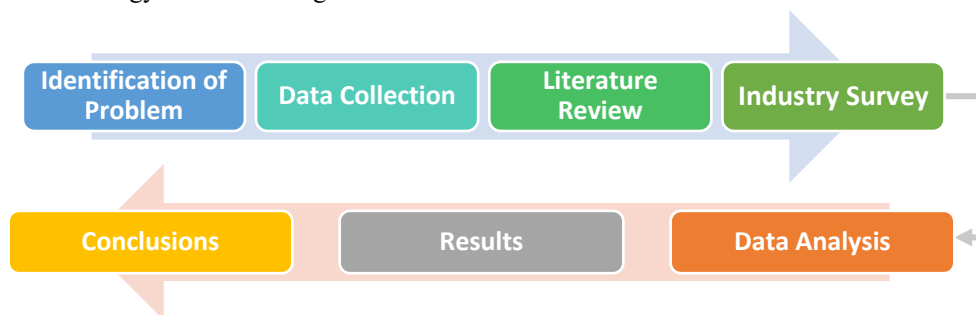
In construction industry, adequate and effective decision-making can mean the difference between success and failure [2]. Bidding is the most important element of the construction industry since it is a mean by which contractors obtain work [3]. This is probably the only option for any contractor firm to sustain in market and achieve its objective of earning the profits by winning tenders [4].

The capability to select most appropriate ventures not only define the contractor's firm wellbeing and success [5], but even its survival and sustainability in the industry [6, 7]. Hurried and irrational involvement in aimless bids for the projects which are

38 incompatible with firms core competencies may result in loss of precious time, money
 39 and other resources, which otherwise could be directed in a more lucrative enterprise
 40 [8, 9, 10]. While not bidding for highly suitable project could lead towards losing a
 41 possibility to earn substantial profits, amplify organization's strength and position in
 42 the market, and establish a profitable relationship with an employer, that can open the
 43 new roads of opportunities for the contractor to endeavor [6].

44 2 Research Methodology

45 With the goal to identify critical bid/no bid decision influencing factors, this study was
 46 performed in three phases. In the first phase, problem statement and research gap was
 47 identified. In the second phase, a detailed literature review was made on the subject
 48 topic, to get the detailed overview of the research already carried out and to identify the
 49 critical factors influencing contractors bid/no bid decision. In the third phase, a closed
 50 ended formal questionnaire survey was conducted to identify and to shortlist the critical
 51 most factors out of those collected from literature, after that data was analysed, results
 52 were formulated and conclusions were made. A brief rundown of the research
 53 methodology is shown in Fig 1.



54 Fig.1. Research Methodology

55 **Sample size**

56 The sample size depends upon the population size, sampling error and confidence level.
 57 To determine the population size, the strategy proposed by Dillman (2011) has been
 58 used.

59 **Data collection**

60 The data was initially collected in two steps as shown below in Fig 2:

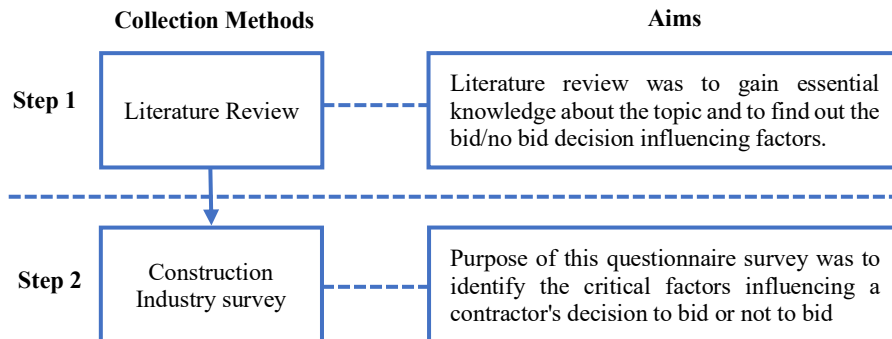


Fig. 2. Data Collection Methods

61

62 Literature review

63 A total of 19 relevant research papers published in international journals were selected
 64 to gather bid/no bid decision-making factors which is being mentioned in Table 1. Total
 65 114 critical factors were identified from the extensive literature review.

66 Industry Survey

67 After detailed literature review, a comprehensive data was collected through industry
 68 survey. Questionnaire survey was conducted on 114 factors identified from literature
 69 review. In total, 150 seasoned construction professionals having managerial and
 70 decision-making positions were requested to mark the relevance of each bid or not to
 71 bid decision-making factor on the five-point Likert scale where 1 stands for very low
 72 while 5 stands for very high. 104 responses were received with a response rate of 69%.
 73 Final ranking of factors was carried out using Equation 1 that includes 40% of literature
 74 score and 60% of industry score.

$$75 \quad FS = 0.4LS + 0.6IS \quad (1)$$

76 Using above equation, total 11 critical most factors were selected and in the end these
 77 factors were categorized into two categories: firm related (internal) factors and project
 78 related (external) factors.

79 Data analysis

80 Descriptive statistics were applied on the collected data. Firstly, factor analysis was
 81 done followed by normalization to reduce data redundancy and to improve integrity of
 82 the data. Spearman's Rank correlation coefficient is used to identify and test the
 83 strength of a relationship between two sets of data. T-test was also applied to check the
 84 difference between mean of two sets. Factors were ranked and results were generated
 85 on the basis of this analysis.

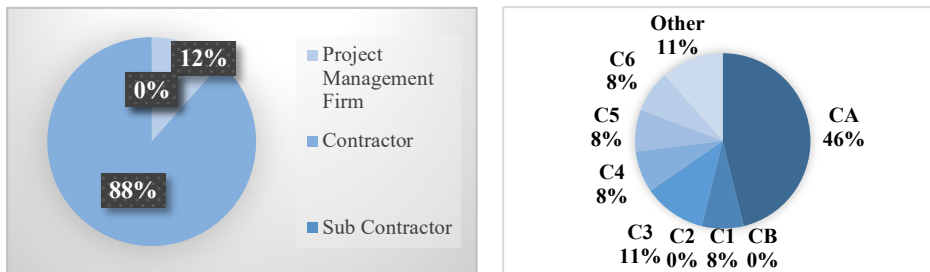
86 3 Results

87 As a result of literature review, 114 factors were identified, ranked on the basis of their
 88 frequency of appearance and importance in the literature. The literature score was

89 converted into a qualitative scale of 1 to 5 where 5 stands for High, 3 stands for medium
 90 and 1 stands for low. The literature score for each factor was calculated and then
 91 normalized. In order to have the opinion of industry practitioners regarding the 114
 92 identified factors and to shortlist the factors, a survey was conducted.

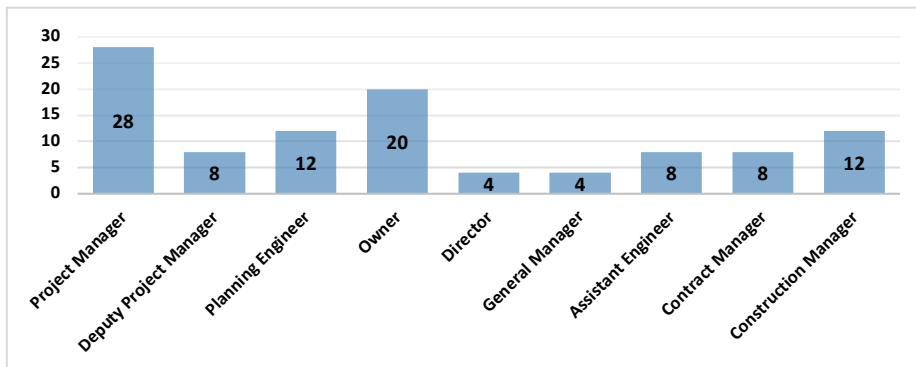
93 3.1 Demographic profile of the respondents

94 Data was collected from contracting, sub-contracting and project management firms.
 95 The respondents were also asked to specify the PEC category of the contractor they are
 96 working with. The organizational profile of the respondents (Left) and PEC Category
 97 of the contractor working with (Right) is shown in Fig 3.



98 **Fig. 3.** Organizational profile of the respondents (Left) and PEC category of the contractor
 99 working with (Right)

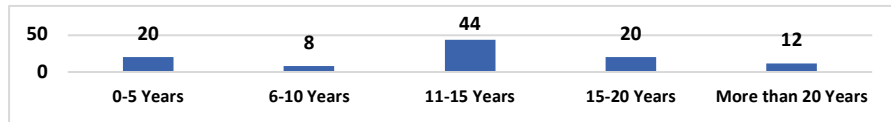
100 Data was collected from construction industry professionals i.e. 27% project managers,
 101 19% owners of construction firms and 12% from construction managers and planning
 102 engineers. Position of respondents in an organization is shown in Fig 4.



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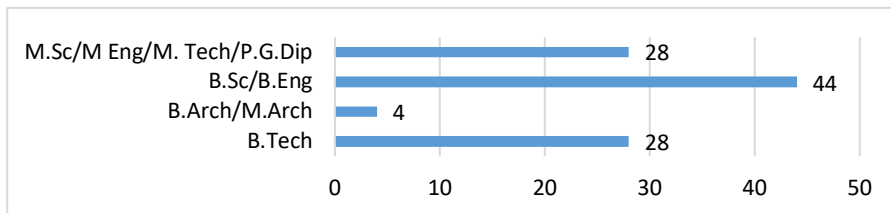
Fig. 4. Position of respondents in an organization

104 Most of the respondents have more than ten years of working experience in the
 105 construction industry. working experience of the respondents is shown in Fig 5.



106 **Fig. 5.** Years of working experience of the respondents

107 Data was collected from the respondents having minimum 12 years of education.
 108 Educational profile of respondents is shown in Fig 6.



109 **Fig. 6.** Educational profile of respondents

110 3.2 Results of questionnaire survey

111 T-test was applied to check mean and variance of the data while correlation and strength
 112 of the data was checked through Spearman's rank-order correlation test. The collected
 113 data from industry practitioners was also normalized to reduce redundancy and
 114 dependency of data. In order to determine the most important factors on basis of both
 115 literature and survey data, combined ranking of factors was carried out on the basis of
 116 cumulative normalized score. Factors were ranked using 40% weighting of the
 117 literature score and 60% weighting of the industry score as shown in Equation 1. Out
 118 of 114 factors, top 11 factors were selected only as these factors cover 50% of the
 119 complete dataset.

120 **Table 1.** t-Test: Two-Sample Assuming Equal Variances

<i>t-Test: Two-Sample Assuming Equal Variances</i>	<i>Survey Rank</i>	<i>Lit Rank</i>
Mean	57.5	57.5
Variance	1092.5	1092.5
Observations	114	114
Pooled Variance	1092.5	
Hypothesized Mean Difference	0	
df	226	
t Stat	0	
P(T<=t) one-tail	0.5	
t Critical one-tail	1.651623859	
P(T<=t) two-tail	1	

t Critical two-tail

1.970516243

121

Table 3. Spearman's rank-order correlation test

Σ	162732
$6 \times \Sigma$	976392
N	114
$n(n-1)$	1481430
	0.659088
P	0.340912

122

Table 4. Results of survey

Lit. Rank	I.D	Factors	Lit. Score	Expert Opinion	Normalized Literature Score (A)	Normalized Expert Opinion (B)	Final Score 0.4A + 0.6B	Cumulative Score	Rank
1	B1	Relationship, Identity & Reputation of client	0.74	4	0.0783	0.0093	0.0369	0.0369	1
4	B2	Financial health of client	0.58	5	0.0615	0.0116	0.0316	0.0685	2
5	B3	Project size (Quantum of work, e.g., cubic measure)	0.53	4	0.0559	0.0093	0.0279	0.0964	3
7	B4	Project type	0.42	4	0.0447	0.0093	0.0235	0.1199	4
2	B5	Need for work	0.37	5	0.0391	0.0116	0.0226	0.1425	5
10	B6	Previous experience in similar projects	0.38	4	0.0403	0.0093	0.0217	0.1642	6
3	B7	Work in hand	0.41	3	0.0436	0.0070	0.0216	0.1858	7
17	B8	Profitability	0.25	4	0.0268	0.0093	0.0163	0.2021	8
19	B9	Project monetary size	0.21	4	0.0224	0.0093	0.0145	0.2166	9
22	B10	Contract conditions / details	0.21	4	0.0224	0.0093	0.0145	0.2311	10

20	B11	Fulfilling the tender conditions imposed by the client	0.21	4	0.0224	0.0093	0.0145	0.2456	11
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123 4 Discussion

124 Out of 11 selected factors like relationship, identity & reputation of client and financial
 125 health of client have higher ranks in both literature and survey responses, showing
 126 consistency between literature and current practices in the industry. However, some
 127 factors like need for work have lower rank in the literature but got higher rank in
 128 industry survey. This indicates the higher importance of these factors in Pakistan
 129 construction industry relative to other construction industries.

130 Results show that six out of 11 shortlisted factors are similar to the top 10 factors
 131 identified by the Jarkas et al. (2013) and top 6 factors identified by Leśniak (2017).
 132 Oyeyipo et al. (2016) after analyzing the data collected through 50 structured
 133 questionnaires found that financial health of client is the most important factor that
 134 contractors must consider while making bid/no bid decisions. El-Mashaleh et al. (2014)
 135 found that Jordanian contractors give more importance to client characteristics i.e.
 136 relationship, identity & reputation of client and financial health of client. While Egemen
 137 and Mohamed (2007) ranked financial health of client as the 5th most critical factor.
 138 Enshassi et al. (2010) also considered financial health of client as well as good
 139 reputation of client as key factors affecting the contractors bidding decision.

140 In a similar study conducted by El-Mashaleh et al. (2014), placed client
 141 characteristics i.e. financial health of client at first place while El-Mashaleh et al. (2014)
 142 ranked relationship, identity & reputation of client as the second most critical factor.
 143 Mohammad Wanous et al. (2000) ranked financial health of client as the second most
 144 critical factor while ranked relationship, identity & reputation of client as the third most
 145 critical factor affecting bid/no bid decision making.

146 However some factors like fulfilling the tender conditions imposed by the client are
 147 ranked higher in the literature but have lower rank in the current study which may be
 148 due to change in area of study and experience of respondents.

149 For example, Mohammad Wanous et al. (2000) ranked fulfilling the tender
 150 conditions imposed by the client as the critical most factor while Oyeyipo et al. (2016)
 151 ranked it as the fourth most important factor but other authors like Chua and Li (2000)
 152 and Bageis and Fortune (2009) do not even consider it as one of the critical factor in
 153 their study. This ensures the reliability of the research findings in the light of the
 154 published literature.

155 **5 Conclusions**

156 Making a bid/no bid decision by contractors in Pakistan construction industry involves
 157 a lot of subjectivity and such decisions are majorly made intuitively. This study presents
 158 critical factors which needs to be considered before making any bidding decision.

159 After performing systematic literature review and industry practitioners survey, the
 160 most critical factors influencing the bid/no-bid decision were identified. Relationship,
 161 identity & reputation of client, financial health of client, project size, previous
 162 experience in similar projects, need for work, profitability and project monetary size,
 163 project type, contract conditions / details and fulfilling the tender conditions imposed
 164 by the client were categorized as the critical most factors. Out of these 11 factors, Need
 165 for work, work in hand and previous experience in similar projects were categorized as
 166 firm related (Internal) factors while other 8 factors were categorized as project related
 167 (External) factors.

168 According to final combined score the three factors i.e. relationship, identity &
 169 reputation of client, financial health of client and project size (quantum of work, e.g.,
 170 cubic measure) were treated as critical factors having high impact on bid/no bid
 171 decision-making while, project monetary size, contract conditions / details and
 172 fulfilling the tender conditions imposed by the client were ranked as the factors having
 173 low impact.

174 So, it was concluded that these 11 factors should be considered by contracting firms
 175 while considering any bidding opportunity in Pakistan construction industry.

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