CRITICAL REVIEW ON FACTORS AFFECTING BID/ NO BID DECISION MAKING PROCESS OF CONTRACTORS IN SURAT

Digraj Darbar[1], Dr. Jayesh Pitroda[2]

[1] Department of Civil Engineering, Parul Institute of Technology Faculty of Engineering & Technology Parul University P.O Limda – 391 760, Gujarat.
[2] Department of Civil Engineering, B.V.M Engineering College, Vallabh Vidhyanagar, Gujarat.

Abstract — *Bid/no-bid decisions are critical for construction contractors because the success and existence of any construction company depends on the outcomes of bidding decisions. However, this process is highly complex and involves multiple noisy data sources. Unfortunately, short timeframe for the decision-making process gives contractors limited time to crosscheck the sources and make the right decision. The purpose of this research is to investigate such factors that affect contractor's decision to bid, especially for small and medium size construction projects. The close-ended questionnaire was employed to gather data from small and medium construction firms in the surat . The respondents were asked to rate each variable on a five-point Likert scale; and the RII was used to determine the relative importance of the factors gathered from the questionnaire, in terms of their importance as perceived by the respondents. The results indicated that the most important factors affecting contractor's bidding strategy are project size, equipment availability, number and capabilities of firm's personnel, profitability (profit potential) and labour availability. The less significant factors include tax, bidding price, tendering method, general overhead and tendering duration. The results of this study can be used to develop a systematic decision process, which can be beneficial for companies possessing limited resources.*

Keywords- Construction Management, BID, NO BID, Decision, GDP

I.   INTRODUCTION

Construction bidding is the process of offering the job by inviting tenders to different parties. The person with least price estimate and satisfying the terms and conditions enlisted by the tenderer wins the bid for executing the project within the stipulated time. The decision to bid or not to bid for the job becomes critical as the consequences on acceptance directly impacts the contractor due to the uncertainty involved in the process. Construction industry in India accounts to 3% in overall GDP growth and future improvement depends on the successful completion of the tendered projects. Hence to complete the work successfully prime importance should be given during the initial stages of the project. Decision making at the earliest stages of construction projects involves a process of gathering information from different sources. Most of the bid decisions are heuristic in nature and often contractors commit to a time consuming and expansive projects as the internal and external aspects are not considered. On the other hand some contractors consider the internal and external factors associated with the bid decisions before committing for a project. This study helps the contractors in identifying the factors influencing the bid/no-bid decision before accepting the proposed work.This study helps in identifying the factors influencing the contractor's decision in the bidding process in India. This study develops a framework or a model that can be used as a decision tool for evaluating the projects at the initial stages. A questionnaire survey was carried out among various contractors over the southern region of India and the responses were being documented. This survey was designed to rank the factors based on their importance and the top ranked factors being studied in detail giving the contractor a concrete base for making bid decisions.
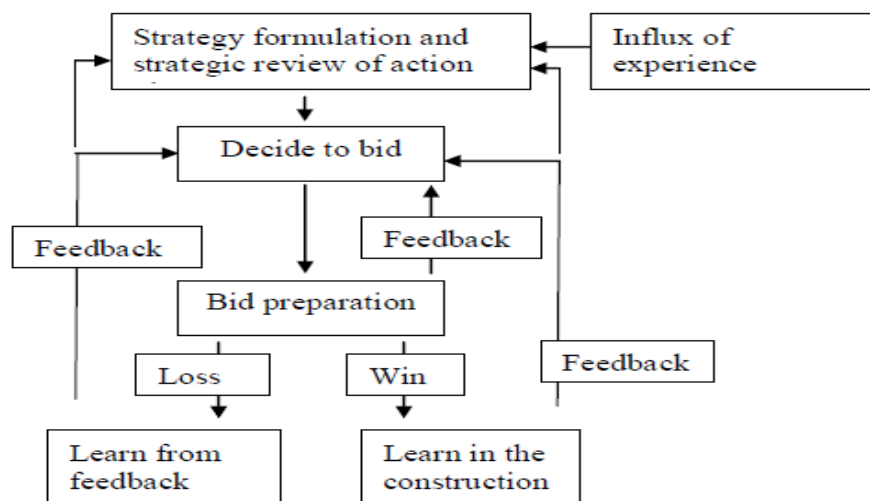
II.   LITERATURE REVIEW

BURTON *Y*. DEAN et al. (1965) this paper has investigated some relevant factors and strategies associated with the research and development proposal preparation and contract award process. Both bidder and customer problems and strategies are studied. The probability of contract award is demonstrated to be a meaningful concept providing competitors employ overlapping mixed strategies. Methods are provided for estimating the probability of contract award in the cases of known and unknown numbers of competitors and are illustrated using examples. [13]

R A Eastham et al. (1993) the paper examines construction companies' project selection decisions, with particular reference to the bid/no bid decision, from a portfolio theoretic viewpoint. A method was proposed by which objective decisions may be made considering the risks involved. An illustration was provided with 'live' bidding data in this paper By using Kangari and Rigg's (1988) probabilistic approach and applying the concept of project decision effect scores associated with measureable variability in an existing portfolio of projects it is possible to produce a measure which describes the efficiency of combining a proposed project with an existing portfolio. Thus it is possible to describe a model which identifies the key decision issues and produces a guide as to the desirability of adding any project to an existing portfolio [1]

Ahmad, I. et al. (1988) ''Questionnaire survey on bidding in construction.'' J. Mgmt. in Engrg., ASCE A study in Syria indicated that the three most important factors, out of the 38 factors, in making bid/no-bid decision include meeting the to-tender conditions, financial capability of the client, and client relation/reputation [2]

Wanous, et al. (1998) Tendering factors considered by Syrian contractors. In: Hughes, W (Ed.), 14th Annual ARCOM Conference, 9-11 September 1998, University of Reading. Association of Researchers in Construction Management, Vol. 2, 535-43. . A study in Singapore revealed four factors that are most significant, out of the 52 important factors, for bidding. These factors include payment record of client, size of client, type of client, and competitiveness of other tenders [3]

Inuwa, I.I.1, et al. (2000) This research was able to identify significant factors that can influence NICs' project planning in building projects procurement systems, through an explorative and a descriptive survey method in northern Nigeria. Their search result reveals that all the respondents agreed that the identified factors are significantly important to theNICs' projects planning in any type of construction procurement system. The respondents ranked contractors 'technical competence, project management capability and understanding procurement tasks, as the most important factors that can influence contractors' project planning in any type of construction procurement system. The attainment of these influencing factors for NICs' project planning will improve the NICs' potentials, hence facilitates its meeting international construction best practice. The research therefore recommends: indigenous contractors' to employ competent personnel and embark on continuous training, embrace project management techniques, and invest in knowledge management; an dclients/consultants adhere to project management procedures. Though, this research is delimited to NICs 'building projects operational planning at the construction stage, further research can be conducted on NICs' strategic planning and its effect on operational planning at the construction stage.[14]

Yean, F. et.al (2005). Factors considered by successful and profitable contractors in mark-upsize decision in Singapore." Building and Environment 40, 1557–1565. A study in Northern Cyprus and Turkish showed the most important factors for bid/no-bid decision process include the need for work, project profitability, strength of firm and client's financial situation [4]

Bagies, A, et al. (2006) A study in The United State of America indicated that the type of job and need for work are identified as the top two factors, out of the 31 factors, in the bid/no-bid decision [1]

Abdulrahman Bagies et al. (2006) This research was considered the front end of a project selection process. In particular, it was based on the problem of business and projects failure in the Saudi Arabia (SA) construction industry The review of the literature resulted in identifying 94 potential factors affecting contractor's bid/ no bid decisions. Parametric, utility- theory, artificial neural network (ANN), fuzzy neural network (FNN), fuzzy logic, and regression techniques were used to construct the mark-up determination models [11]

Egemen, M.et.al et al. (2007). "A framework for contractors to reach strategically correct bid/no bid and mark-up size decisions." Building and Environment 42, 1373–1385. A study in Qatar revealed 10 important factors, out of the 43 factors, in the bid/no-bid and mark-up decision-making. These factors include previous experience with the employer, need for work, current workload, previous experience in similar projects, project size, identity and reputation of the employer in the industry, employer's financial stability, availability of other projects, promptness of the employer in the payment process, and tender documents' quality level [5]

Min-Yuan, Cheng et al. (2010)in this paper Vietnam bid case was used to validate the efficacy of BD-MCPM. Results indicate that the proposed BD-MCPM can effectively assist primary decision makers (PDMs) to select bids on which

their firm should bid and to establish optimal markup scales. decisions were identified through a review of relevant literature. Forty-four and 29 potential factors for bid / no bid and markup decision making, respectively, were identified and then filtered using the questionnaire analysis method to a shortlist of ten and eight, respectively . BD-MCPM model was validated on actual project bids obtained from surveys of construction companies operating in Vietnam and helped PDMs successfully select cases on which to bid and set optimal markups.[22]

Morteza Shokri-Ghasabeh et al. (2010) four phase integrated bid/no bid decision process, which is based on the application of earlier lessons learned collected by construction contractors, was introduced and recommended in this paper In this paper, as the first phase of a thorough research study, based on an extensive literature review, a number of research studies on bid/no bid decisions were identified and discussed and an authentic list of generic bid/no bid decision criteria, which can be very useful for contractors, was derived. The study also explained the integrated bid/no bid decision process in four phases in which the contractors need to list the important criteria and evaluate the projects while they are assisted by the lessons they have learned from their previous experience. As the last phase, the contractors are encouraged to make the bid/no bid decision dynamic by collecting the lessons they learned from previous similar projects that they had bid for and delivered.[20]

Sukkasam, B., et al. (2010) "Factors for Selecting Local Government's Construction Works for Bidding a contractor Perspective" Master thesis, Suranaree University, Nakhon Rajchasima, Thailand. A study in Thailand studied factors that have the potential to impact bidding selection of local government's construction works. Two provinces in the north-eastern part (2.6 million populations) and eastern part (0.7 million populations) of Thailand were selected for the study. Among 14 factors, the most important factors were project size, site location, relationships with the owner, type of work, and availability of working capital [8]

Adnan Enshassi et al. (2010) The purpose of this paper was to identify and rank the factors that affect the bid/no bid decision according to their relative importance from the perspective of the contracting parties operating in the Gaza Strip, Palestine, objectives of this research were investigated through a postal questionnaire, which covered a randomly selected sample of 63 contractors, 29 clients and 13 consultants operating in the construction industry in the Gaza strip. The questionnaire was structured based on related literature, the pilot study and actual factors affecting bidders' decisions to bid or not that arise from special conditions in gaza. paper provides supportive practical solutions for contractors, clients and consultants to enhance and improve bidding decisions. It is recommended that clients and consultants consider the financial capabilities, technical capabilities and staff competencies of the contractors during the awarding stage, and not simply focus on the lowest bid.[15]

El-Mashaleh, et al. (2014). "Understanding Key Bidding Factors Considered by Top Jordanian Contractors." Jordan" Journal of Civil Engineering, 8 (4), 455-464. A study in Jordan revealed that the top three factors, out of the 53 bidding factors, in the Jordanian construction industry, are client's financial capability, client's reputation for making timely payments, and client's identity [7]

Abdulrahman Bageis et al. (2014) aim of the paper was to explore basic factors that assist new and existing small and medium sized construction enterprises (SMEs) to be successful. This paper reports o the results of a preliminary study that examined these factors globally. Then the paper examines the findings in the context of construction contracting firms operating in Saudi Arabia (SA) This review identifies a large number of factors that are seen as being potentially significant in delivering organizational success. In second phase of the paper involves exploring the relationship between project cost control and business success in more depth via a small number of project-centered case The aim of the present paper was to explore basic factors that assist new and existing small- and medium-sized construction enterprises (SMEs) to be successful. In this regard, the result of the literature review shows that there is a strong contribution from both the intra and inter organization success factors in obtaining better performance in these companies. The factors identified are important for the company because they provide it with the foundation of a good contracting company; this in turn allows the company to remain in business profitability. Also, these factors are vital to protect the company from gaining a bad reputation and to grant continuous improvement for the company [6]

Dr jayeshkumar pitroda et al. (2015) This paper presented the analysis of factors affecting contractor's bidding strategy of 81 respondents from various construction firms of central Gujarat region using RII method. In this research, the study was focused on the bidders' competitiveness strategies during the procurement stage in the project life cycle. The data collected was manually analyzed by the RII method with the help of which a decimal figure for each factor is obtained which is known as its Relative Importance Index total 50 factors were analyzed The results indicated that the most important factors affecting contractor's bidding strategy are:Terms of payment, Current financial situation of the company, Possessing enough qualified technical staff to do the job, Possessing enough qualified technical staff to do the job, History of client's payments in past projects (considering delays, shortages), History of client's payments in past projects (considering delays, shortages), Financial status of your company (working cash requirement of project) and Availability of the required materials within the region.[27]

Jin-Sub Hwang et al. (2015) Recently, the award of overseas construction projects to Korean construction companies has substantially increased, and the number of Korean bids to win such projects has grown significantly also. Overseas project bidding characteristically requires ahigher resource input cost in the initial preparation phase than does domestic project bidding. However, the bidding process of construction companies is frequently suspended for various reasons, and hence the opportunity cost associated with the bidding process becomes a sunk cost which, in turn, puts the bidder at a further loss. Therefore, by identifying projects with the highest chance of proceeding up to the final bid submission in the early phase of bidding, the sunk cost that results from a bid drop or suspension can be reduced and the projects with high bid probabilities can be targeted to enhance order possibility and performance capability. Unfortunately, many contractors tend to rely on qualitative assessments based on their past experiences and intuition, or onthe Chief Executive Officers' (CEO) subjective instructions, when making a bid decision. In this respect, this study proposes a model utilizing the logistic regression method, analyzing the correlation between various factors of project and bid decision making to increase the effectiveness of future decision making. If factors relating to the internal decision-making process of a construction company and overseas bidding process are coordinated, the bidders can be expected to enhance the reliability of their decisions using this model, and the cost incurred during a bidding process may be reduced.[24]

A. LEŚNIAK1 et al. (2015) The paper's aim is first to depict an output set of observed variables, that is bid /no bid factors, in terms of a smaller set of latent variables which cannot be directly observed and then to interpret the dependencies between them. In the study selected experts evaluated 44 bidding procedures, with emphasis on the participation of the contractor. Each tender was described by means of 15 criteria (factors identified in Poland and presented in a influencing the bid/no bid decision. Each factor was evaluated in accordance to a1-7 scale, where 1 was the factor with no influence on the decision and 7 was the one with the greatest significance in decision making [18]

LESINAK et al. (2015): For the construction company, tendering is the most popular way of acquiring contracts. The decision to participate in the tender needs to be made carefully, as it affects the condition of the company and is an important aspect in its quest for success. The bid/no bid decision making is a complex process involving a number of factors. The research carried out so far has mainly concerned the identification of the various kinds of influences on contractors' bidding decisions. The researchers, on the basis of contractors' opinions, created rank lists in an attempt to categorize the factors. In this paper the author employs factor analysis which belongs to basic methods of multi-dimensional data analysis. The paper's aim is first to depict an output set of observed variables, that isbid/no bid factors, in terms of a smaller set of latent variables which cannot be directly observed and then to interpret the dependencies between them.[19]

Agnieszka Leśniak et al. (2015) In this research carried out so far has been concerned mainly with identification of various kinds of factors influencing contractors' bidding decisions. The present study describes a group of factors – identified using a survey method – that may influence the contractor's decision to participate in a tender procedure. An important problem revealed by the survey is assessment of experts' opinions consistency. The method used in this paper for the consistency evaluation is Kendall's coefficient of concordance

Bhushan Ratekar et al. (2016) In this research paper Based on an extensive literature review, a number of research studies on bid/no bid decisions found out and discussed with the employees of EPC Company and to develop four stage integrated framework in which contractor need to identify factors that influencing the bid/no bid decision, while they are assisted by the lessons they have learned from their Past projects. The SWOT analysis is also recommended to take the bid/no bid decision which helps contractors to identify their strength, weaknesses, opportunity and threats against particular projects. Finally bid Assessment will helps the contractor to take bid/no bid decision more correctly. This research work has contributed to the existing body of knowledge in that it would help to Encourage the contractors to make the bid/no bid decision by using right tools at right time. As a result, the contractors can select more feasible projects with a higher likelihood of success by integrating SWOT analysis, Bid assessment and lessons learned into their bid/no bid decision process

Isaac Olaniyi Aje1 et al. (2016) The focal point of this paper was to assess the perspectives of construction professionals on factors influencing tender prices of construction works and the contribution of the factors to the success rate of contractors. Using literature review and questionnaire survey, 15 factors were identified in respect to contractors' tender price and success rate in Nigeria. The findings of this study based on the results of statistical analyses (mean score and chi-square) reveal that all the construction professionals (architects, builders, engineers and quantity surveyors) are of the opinion that material availability, labour productivity and level of profit are the most significant factors that highly influence tender price of construction works and consequently affect the success rate of contractors in competitive bidding. Project definition and construction plan have least influence on contractors' tender price. Also, it was found that government policy does not have significant effect on contractors' success rate in competitive bidding in Nigeria.[14]

Huawang Shi1 et al. (2016) Aiming at aiding bid/no-bid decision making, this paper introduced a novel identificationmodel through integration of rough sets(RS) and GRNN, with NPSO algorithm tooptimize the smooth factor GRNN neural network and improve the prediction accuracyand convergence of networks. This method comprehensively considers various parametersthat affect the tender decision. Rough sets(RS) were used to reduce the

factors .MIBARK algorithm is applied in attribution reduction to simplify the network input dimension number. Furthermore, the NPSO algorithm is proposed to realize the optimization of GRNN parameters. A simulation example is provided and some comparisons with other ANN algorithms are carried out. The results show that the model proposed in this paper exhibits fairly good prediction accuracy in the same test sample, that is,the value of MSE is only 0.0112.The results of examples show that using NPSO-GRNNneural network prediction model for Bid/no-bid decision prediction is reasonable and feasible. NPSO-GRNN neural network model offers a novel model and method to predictBid/no-bid decision.

O. O. OYEYIPO et al. (2016) A structured questionnaire was used as the principal instrument for collecting data from respondents. A total sample of one hundred (100) was drawn from these collections of construction contractors from Lagos state. Fifty (50) were completed and returned representing a 50% response rate. Frequency, percentage, mean score and spearman correlation were used in analyzing data collected for the study. The results indicate that financial capability of clients, availability of capital and availability of material are the most important factors contractor consider when taking bid/no bid decision. The study also reveals that competition (number and identity of competitors) does not have significant influence on contractors' bidding decision. The study recommends that contractors should also increase their reputation in the construction industry by acquiring technical competencies and capabilities as these qualities have become important considerations in assessing contractors' competiveness, and key indicators of successful tendering in construction projects. [17]

Huawang Shi1,2 et al. (2016) this paper introduced a novel identification model through integration of rough sets(RS) and GRNN, with NPSO algorithm to optimize the smooth factor GRNN neural network and improve the prediction accuracy and convergence of networks. This method comprehensively considers various parameters that affect the tender decision. Rough sets(RS) were used to reduce the factors. MIBARK algorithm is applied in attribution reduction to simplify the network input dimension number. Furthermore, the NPSO algorithm is proposed to realize the optimization of GRNN parameters. A simulation example is provided and some comparisons with other ANN algorithms are carried out. The results show that the model proposed in this paper exhibits fairly good prediction accuracy in the same test sample, that is, the value of MSE is only 0.0112.The results of examples show that using NPSO-GRNN neural network prediction model for Bid/no-bid decision prediction is reasonable and feasible. NPSO-GRNN neural network model offers a novel model and method to predict Bid/no-bid decision.

Ru Liang,1 et al. (2016) This paper developed a support decision-making system for contractor selection of bidding in construction projects based on individual indicators and collaborative indicators. Construction units, design units, and suppliers are used to form a cross-functional contractor. Then, a cross-functional contractor with 28 candidate units distributed in the three departments (construction units, design units, and suppliers)is used as an example to explain the method. The best 12 candidate units which are distributed in three different functional-departments (construction units, design units, and suppliers) is used to illustrate our method. As a result of limitation of resources and different preference of DMs, we can further modify the model and increase some objectives and constraints for the model. In addition, theory thoughtsput forward in this paper are hoping to bring some enlightenment for bidding problems in construction projects.[25]

Opeyemi Olanrewaju Oyeyipo et al. (2016) The findings of this study serve as a basis for making the following conclusions and recommendations. The purpose of this paper was to evaluate the important factors local and expatriate contracting organizations consider in bidding decisions in the Nigerian construction industry. This paper highlighted the major factors considered by contractors and compared them with related research in other parts of the world. Finally, the Kendall concordance coefficient was used to test the level of agreement among indigenous and expatriate contractors regarding the 48 bid/no bid decision factors for construction projects. Kendall's coefficient of concordance provided sufficient evidence to conclude that there is no significant degree of agreement among local and foreign contractors concerning bid/no decisions for construction projects in Nigeria.[22]

J. Kiran Kumar et al. (2016) In This paper the factors influencing the bid decisions obtained through the response from the survey questioning various contractors from different construction projects in India. This study also ranks the factors obtained based on their importance weight ages and the top ranked factors being studied using a statistical tool. They found the top potential factors 1. Experience and familiarity of your firm with this specific type of work 2. Current financial situation of the company 3 Having qualified material suppliers [16]

Sławomir Biruk et al. (2017) produces an economically justified bid price together with its breakdown, maintaining the logical proportion between unit prices of particular items of the schedule of payment. Contrary to most methods presented in the literature, the method does not focus on the trade-off between probability of winning and the price bus was solely devoted to defining the most reasonable price under project-specific circumstances. The approach proposed by author promotes a systematic approach to real-life bidding problems. It integrates practices observed in operation of construction enterprises and used directly available input. It may facilitate establishing the contractor's in-house procedures and managerial decision support systems for the pricing process.[26]

Tolulope Samuel Fawale et al. (2017) noted that the development of the construction industry has led to an increase in the number of criteria imposed by project clients for selecting contractors. The trend has attracted research interest in devising various methods for helping project clients to assess contractors' bids. Hence, this study aims at identifying and assessing different types of contractors' bidding strategies with a view to determining their impact on bid success. To achieve the aim, the study objectives evaluated different types of contractors' bidding strategies adopted in the NCI and also assessed the success rate of contractors' bid. To win a bid award, contractors need to strategize, hence the need for a bidding [23]

Oluwole Alfred Olatunji et al. (2017) The purpose of this paper was to investigate the factors that affect the decision of indigenous construction contractors to bid or not to bid in Nigeria**.** In this paper Analysis was conducted on data from questionnaires received from 64 engineering management employees of leading construction companies which are members of Nigeria's Federation of Construction Industry. The study identified 41 significant decision factors often considered by Nigerian indigenous contractors before the bid. Mean item scores were obtained for each of the factors. Principal component analysis was used to point out the most significant decision factors. [9]

Sławomir Biruk et al. (2017) approach proposed in the paper may facilitate establishing the contractor's in-house procedures and managerial decision support systems for pricing process. It enables the estimators to consider many factors (some of them of purely qualitative character) that affect both the chance of winning a contract and capacities to deliver and satisfy the client. However, the presented approach for modeling bidding decisions is a concept and needs validation. in this paper linear programming model is proposed for this purpose. The application of the models was illustrated with a numerical example. The model produces an economically justified bid price together with its breakdown, maintaining the logical proportion between unit prices of particular items of the schedule of payment. Contrary to most methods presented in the literature, the method does not focus on the trade-off between probability of winning and the price but is solely devoted to defining the most reasonable price under project-specific circumstances. The approach proposed in the paper promotes a systematic approach to real-life bidding problems. It integrates practices observed in operation of construction enterprises and uses directly available input. It may facilitate establishing the contractor's in-house procedures and managerial decision support systems for the pricing process [26]

III. CONCLUSION

The decision to accept or decline a bidding invitation for a new project is one of the most important tasks for construction contractors. Decision-making during the earlier stages of construction projects is a highly complex process, as it involves procuring information from disparate noisy sources, quantifying the combined impact of many factors, and subsequently producing cost estimation for the project. Small and medium construction companies, with limited resources, are always challenged by time constraints and a complex bid/no-bid decision process. Inefficient decision-making obstructs prosperity and jeopardises the survival of a construction company. This study used a five-point Likert rating scale based questionnaire for gathering data from construction companies Surat The RII (Relative Importance Index technique) was employed to determine the relative importance of the 39 factors gathered from questionnaire in terms of their importance as perceived by the respondents. The results indicated that the most important factors affecting contractor's bidding decision included project size, equipment availability, number and capabilities of firm's personnel, profitability (profit potential), labour availability, firm capital, project duration, appropriately determining project cost, payment condition and, a stringent observation of construction details. However, the less significant factors included tax, bidding price, tendering method, general overhead and tendering duration. The study revealed a strong influence of the top five factors on the bidding decision process. This finding implies that the bid/no-bid decision process of contracting organisations in provincial areas is limited by the lack of skilled personnel, advanced equipment and labour. The result of this study can be used to develop a systematic decision process, which could be useful for small and medium companies with limited resources.

IV. REFRENCE

1. Bagies, A. and Fortune, C. "Bid/ no-bid decision modelling for construction projects. In: Boyd, D(Ed) Procs 22nd Annual ARCOM Conference, 4-6 September 2006, Birmingham, UK, Association of Researchers in Construction Management, 511-521.
2. Ahmad, I., and Minkarah, I. (1988). ''Questionnaire survey on bidding in construction.'' J. Mgmt. in Engrg., ASCE, 4(3), 229–243.
3. Wanous, M, Boussabaine, A H and Lewis, J (1998) Tendering factors considered by Syrian contractors. In: Hughes, W (Ed.), 14th Annual ARCOM Conference, 9-11 September 1998, University of Reading. Association of Researchers in Construction Management, Vol. 2, 535-43.
4. Yean, F., Linga Y., and Liu, M. (2005). "Factors considered by successful and profitable contractors in mark-upsize decision in Singapore." Building and Environment 40, 1557–1565.
5. Egemen, M., and Mohamed A.N. (2007). "A framework for contractors to reach strategically correct bid/no bid and mark-up size decisions." Building and Environment 42, 1373–1385.
6. Jarkas, A.M., Mubarak, S.A., and Kadri, C.Y. (2014). Critical Factors Determining Bid/No Bid Decisions of Contractors in Qatar." J. Manage. Eng., 30(4): 05014007 [DOI: 10.1061/(ASCE)ME.1943-5479.0000223.]

7. El-Mashaleh, M.S., Ashraf Al-Jundi, A., Saed Mattar, S., Ali, R.A., and Al-Hammad, J (2014). "Understanding Key Bidding Factors Considered by Top Jordanian Contractors." Jordan" Journal of Civil Engineering, 8 (4), 455-464.

8. Sukkasam, B., (2010) "Factors for Selecting Local Government's Construction Works for Bidding a contractor Perspective" Master thesis, Suranaree University, Nakhon Rajchasima, Thailand.

9. M. Wanous, A. H. Boussabaine, and J. Lewis, "To bid or not to bid: a parametric solution," Construction Management andEconomics, vol. 18, no. 4, pp. 457–466, 2000.

10. El-Mashaleh, M.S., Ashraf Al-Jundi, A., Saed Mattar, S., Ali, R.A., and Al-Hammad, J (2014). "Understanding Key Bidding Factors Considered by Top Jordanian Contractors." Jordan" Journal of Civil Engineering, 8 (4), 455-464.

11. Abdulaziz M., Jarkas, Saleh A. Mubarak and Charles Y. Kadri. (2014). "Critical Factors Determining Bid/No Bid Decisions of Contractors in Qatar." J. Manage. Eng., 30(4): 05014007, DOI: 10.1061/(ASCE)ME.1943-5479.0000223

12. Bagies, A. and Fortune, C. "Bid/ no-bid decision modelling for construction projects. In: Boyd, D(Ed) Procs 22nd Annual ARCOM Conference, 4-6 September 2006, Birmingham, UK, Association of Researchers in Construction Management, 511-521.

13. Manuscript received April 29, 1965. Presented at the 1965 American Meeting of The Institute of Management Sciences, San Francisco, CaUf.The author is with the Division of Organizational Sciences, Case Institute of Technology, Cleveland, Ohio

14. Isaac Olaniyi Aje, Timo Olugbenga Oladinrin and Angeline Ngozika Chibuike Nwaole. (2016). Factors influencing success rate of contractors in competitive bidding for construction works in South-East, Nigeria. *Journal of Construction in Developing Countries*, 21(1): 19–34. doi: 10.21315/jcdc2016.21.1.2

15. Journal of Financial Management ofProperty and ConstructionVol. 15 No. 2, 2010pp. 118-142q Emerald Group Publishing Limited1366-4387DOI 10.1108/1366438101106342

16. A STUDY ON KEY FACTORS INFLUENCING BID/NOBIDDECISIONS FOR DIFFERENT CONSTRUCTIONPROJECTS IN INDIAInternational Journal of Civil Engineering and Technology (IJCIET)Volume7, Issue 6, November-December 2016, pp. 732–737, Article ID:IJCIET_07_06_081 Availablonlineat http://www.iaeme.com/IJCIET/issues.asp?JType=IJCIET&VType=7&IType=6ISSN Print: 0976-6308 and ISSN Online: 0976-6316

17. FACTORS AFFECTING CONTRACTORS' BIDDING DECISION FOR CONSTRUCTION PROJECTS IN NIGERIA Journal of Construction in Developing Countries, 2016 21(1): 19–34. doi: 10.21315/jcdc2016.21.1.20

18. CLASSIFICATION OF THE BID/NO BID CRITERIA –FACTOR ANALYSIS Archives of civil engineering 2015

19. An integrated bid/no bid decision process for construction contractorsbased on lessons learned Proceedings 5th Built Environment Conference 18-20 July 2010 An integrated bid/no bid decision process for Durban, South Africaconstruction contractors based on lessons learned ISBN: 978-0-620-46703-2

20. Wanous, M, Boussabaine, A H and Lewis, J (1998) Tendering factors considered by Syrian contractors.*In:* Hughes, W (Ed.), *14th Annual ARCOM Conference*, 9-11 September 1998, University of Reading.Association of Researchers in Construction Management, Vol. 2, 535-43.

21. Impact of Contractors' Bidding Strategies on Bid Success in the Nigeria Construction Industry Published by Faculty of Built Environment, Universiti Teknologi Malaysia Website: http://www.ijbes.utm.my IJBES 4(1)/2017, 23-27

22. Bidding Decision Making for Construction Company Using a Multi-Criteria Prospect Model Sec. 4, Keelung Rd., Taipei, Taiwan, R. O.C. 106, Dept. of Construction Engineering E-mail address: myc@mail.ntust.edu.tw

23. Impact of Contractors' Bidding Strategies on Bid Success in the Nigeria Construction Industry INTERNATIONAL JOURNAL OF BUILT ENVIRONMENT AND SUSTAINABILITY Published by Faculty of Built Environment, Universiti Teknologi Malaysia Website: http://www.ijbes.utm.my

24. a Bid Decision-Making Model in the Initial Bidding Phase for Overseas Construction Projects KSCE Journal of Civil Engineering (2016) 20(4):1189-1200 www.springer.com/12205

25 Bidding Strategy to Support Decision-Making Based on Comprehensive Information in Construction ProjectsHindawi Publishing CorporationDiscrete Dynamics in Nature and Society Volume 2016, Article ID 4643630, 15 pages

26 ."Modelling contractor's bidding decision" Engineering Management in Production and Services Volume 9 • Issue 1 • 2017

27 .JOURNAL OF INTERNATIONAL ACADEMIC RESEARCH FOR MULTIDISCIPLINARY Impact Factor 1.625, ISSN: 2320-5083, Volume 2, Issue 12, January 2015