Attributes Affecting Success of the Residential Projects – A Review

Pratiksha Ashitkumar Dhabuwala[1], Er. Ashish Harendrabhai Makwana[2], Dr. J. R. Pitroda[3]

[1]Final year M.Tech. Student Construction Engineering and Management, Civil Engineering Department, BVM Engineering College, Vallabh Vidyanagar, Gujarat

[2]Planning Engineer, Tata Projects Ltd., Rajasthan

[3]Associate Professor, PG Coordinator Construction Engineering and Management, Civil Engineering Department, BVM Engineering College, Vallabh Vidyanagar, Gujarat

Abstract : Construction industry is complex in nature and construction projects in India face many challenges and complex issues, such as time, cost, safety, quality and stakeholder satisfaction. According to Construction scenario there are various factors that affecting the residential project. These review paper shows the selection of criteria based on by giving the importance to other researcher's research. The criteria were curtailed down according to literature review studied in this paper, interaction with stakeholder which are Engineers, Project managers, Architects, Consultants, Developers and educational experts, of Surat and Vadodara city in Gujarat.

***Keywords*— Cost, Quality, Safety, Stakeholder satisfaction, Time**

I. INTRODUCTION

Construction industry plays a vital role in the growth and accomplishment of the objectives of society. Construction is one of the main industries and contributes about 10% of the GDP of emerging regions. According to Navon (2005) The construction industry is dynamic in nature because it involves a large number of groups, such as Engineer, Architect, Contractor and stakeholders. The output of the construction industry is influenced by the national economy. Although individual organizations have been calculating their success for many years, there has been little consistency in the data and how it has been written. Performance can be assessed by main assessment metrics. The goal of the Main Performance Indicators is that stakeholder want their projects to be delivered: on schedule, on budget, without defects, stakeholder satisfaction, safely, by successful companies. Regular customers demand continuous progress from their design team in order to accomplish this year-on-year: improvements in project costs and time.

In the case of construction, delay may be defined as an overrun of time either beyond the date of completion mentioned in the contract or date agreed by the parties for the delivery of the project. It is a project that falls on its scheduled timeline and is known to be very general problem in construction projects. From the owner side the meaning of delay means loss of revenue due to lack of manufacturing facilities and cost-effective space or dependency on existing facilities. In certain situations, delay means higher overhead costs to the contractor due to longer operating hours, higher material costs due to inflation, and increased labor costs. The completion of projects on schedule is a measure of progress, but the construction process is subject to many factors and inescapable pressures from many sources. These sources include the success of the parties, the availability of resources, environmental factors, the participation of other parties and contractual relations. However, it seldom happens that a project is finished within a defined timeline.

II. LITERATURE REVIEW

The evaluation text includes the analysis of multiple scholars and the findings of separate study articles. The studied PhD thesis, reviews and books have been released in different national and Foreign journals, and their main findings are described and shown at the end of this article. This improves knowledge of the subject and offers extensive background in the right flow of work.

Teo et al. (2005), had research that site unsafety are mostly happen in the event of ineffective company procedures, dangerous practices, poor attitudes of construction staff, poor management dedication and insufficient awareness of safety and training of employees. A questionnaire was designed to classify the most significant variables influencing the protection of the site. Respondents were asked to determine the degree to which each of the 50 variables affected the safety efficiency of the project on a five-point Likert scale. This are some factors which also having subfactors but we are focus on the main factors only: Quality of subcontractors, Understanding and implementation of safety, Carrying out work in a safe and professional manner, Carrying out work in a safe safety, Supervisors and workers attitudes towards safety, Contextual characteristics of workers, Monetary incentives, Non-monetary

incentives, Disciplinary action. This paper reports the t test results and factor analysis results. The results of the multivariate analysis involving regression procedures are reported.**[19]**

Jha et al. (2006), The factors that influenced the quality performance of projects were: disputes between project participants; hostile cultural environment; harsh weather conditions; lack of understanding and ignorance of the PM, codes and specifications, defective project conceptualization and competitive pressures during the tendering process. Critical success factors were the competence of the project manager, the cooperation of the top management, the monitoring and input of project participants, the relationship with project participants and the competence of the owners. This preliminary survey was performed and a statistical study of the responses was carried out and these variables were identified. Questionnaire survey was done among the small and medium construction firms. Data were analyse in SPSS and find the mean score.**[7]**

Al Haadir et al. (2011), carried out critical success factor for safety program in companies. They achieved this by using AHP weights for priority factors. Use of Kendoll coefficient of concordance for statistical model. Major factor are Personal attitude, safety training, teamwork, management support; clear and reasonable objectives, effective enforcement and suitable supervision. **[1]**

Shirouyehzad et al. (2011), Carried out research to improve safety in organizations, different factors that may influence its implementation need to be studied. this study considers 16 critical success factors related to a safety program in order to evaluate projects' performance. By using TOPSIS method in 5 different project with 15 factors are Clear and realistic goals, Good communication, Delegation of authority and Responsibility, Sufficient resource Allocation, Management support, Program evaluation, Continuing participation of Employees, Personal Motivation, Personal competency, Teamwork, Positive group norms, Personal attitude, Effective enforcement scheme, Safety equipment acquisition and Maintenance, Appropriate Supervision, Appropriate safety education and training. For measure of critical success factors they use the five point likert scale.**[18]**

Ghoddousi et al. (2012), research on the productivity of subcontractor and its effects on project via structured questionnaire. A total of 31 factors selected and were divided into 7 broad categories. A method to identify the factors and assess the expectations of project managers of the degree of impact of these factors was also applied to the productivity factors. Furthermore, the time percentages have been divided into five groups by Likert scale to simplify the response process. It is critical that the internal accuracy of any scales or subscales that may be used is measured and recorded while using the Likert scales. The Cronbach Alpha reliability test was chosen for its accuracy and simplicity. The study revealed that the most significant factors influencing subcontractors' efficiency in descending order include: materials, construction technology and process, preparation, supervision, rework, weather and employment conditions.**[4]**

Salim S. Mulla et al. (2015), research on the issue of time and cost overrun is not bound to any specific form or size of project, nor does it have any constraints on location or area. They all faced more or less similar problems in terms of time and cost overruns. Analysis of various case studies that have been affected by time and cost overruns has been carried out and concluded Land acquisition issues, Change in scope of work, Delay in payment of work completed, Delay in Client/decision, Architect's Incorrect estimate, faulty design, bad bidding, erratic flow of finance, management shortcomings, lack of cooperation between the various parties concerned. They also recommend remedial steps to overcome time and expense overruns in building projects.**[16]**

Shanmugapriya et al. (2015), carried out Ranking key quality factors by structured questionnaire for survey. Systematic measurement of quality and non quality cost, Using technology with higher operational efficiency, updating the knowledge, Incentives and rewards, Training in the principles of quality, Two way communication, Site quality inspection of materials, Encouraging the employees.**[17]**

Dinesh Bhatia et al. (2016), carried out thesis study for cost overruns and schedule overruns for private residential buildings in Pune region of Maharashtra. They found poorly executed project time estimation, unpredictable situations, internal disputes within the project team and inadequate coordination of work and preparation causing overriding schedules. They also found that material shortages, labor shortages, late delivery of materials and equipment, unavailability of skilled workers, delay in payment of development, financial difficulties for contractors, drawing not obtained from consultants, inadequate communication and cooperation by owners and other parties are grounds for cost overruns.**[3]**

Leena Mali et al. (2016), conducted a study in Pune region of Maharashtra to identify causes of delays in construction projects. They carried out literature review of past research work and lists out various causes of delay. They use RII method They identified top 10 causes of delays namely shortage of labor, lack of high technology of mechanical equipment, Delay in site mobilization, permits from municipal bodies, Poor qualification of contractors technical staff and Internal conflicts within the project team, Material shortage, Shortage of labor, Late delivery of materials and equipment. They also discussed effects of all this delays on projects.**[10]**

Mandar C. Borse et al. (2016), carried out their study and find the factors overrun which are financial problem, Delay in contractors payment, shortage of labour, slow decision making, shortage of equipment. They utilize importance index method and take case study of factory building and concluded Slow in making decisions, Unclear site drawings supplied, Slow drawing revision and distribution, Design changes, Frequently change in PMC, Incomplete design at the time of the tender, Additional work at the request of the owner, Lack of cost planning during the pre-and post-contracting period, Delays in the delivery of information to the contractor during the construction phase, Contract claims such as extension of time with cost claims, Changes to standard drawings

during the construction phase, Delays in cost variations and additional works, Incorrect BOQ as notable reasons for time and cost overruns.**[11]**

Naveenkumar.G.V et al. (2016), conducted questionnaire survey and analyzes data using SPSS software and utilize ranking method. He concluded that low productivity of labor, Slowness in giving instruction, Delaying in bill settlement, Poor procurement programming of materials, Lack of maintenance for the equipment and Strikes, riots and other external forces are critical factors affecting time overruns. He also concluded Delay in primarily handing over of project, wrong/inappropriate choice of site, Insufficient planning for the project, rise in material costs due to constant closures, restrictions on resources, volatile weather conditions, cost fluctuations for construction materials, issues with allocating the equipment, insufficient control of cost reports during pre and post-contract periods, changes in design as 10 factors affect cost overruns.**[12]**

Prof. Yogini K. Patil et al. (2016), has carried out their study with 70 samples of high rise building. According to them Cost overruns is a different problems faced by high-rise building construction projects in India. They found out that five most significant factors causing cost overruns in high-rise constructions are frequent breakdown of construction plants, inflation, equipment's and rework high transportation cost and change in material specification. They utilize relative importance index method for the ranking.**[14]**

Piyush et at.(2016), research on factors affecting customer satisfaction are builder reputation, location of the building, aesthetic appearance of the building, provision of services, size and space of rooms which are called attributes of building. They uses Relative Importance Index (RII), important index and relative importance ratio method for ranking.**[15]**

Waghmare et at.(2016), studied 22 factors as critical for the success of the stakeholder management process in construction projects by most respondents. The three key factors affecting the stakeholder management process in the construction sector were ranked on the basis of their RII: recruiting a project manager with a high level of knowledge and experience, a clear assessment of an alternative approach based on stakeholder concerns and meeting the stakeholder requirements, and maintaining good coordination and communication between the project and its stakeholders which are affecting most to stakeholder satisfaction.[20]

Jape et al. (2017), studied that factors which affecting the time and cost overrun furthermore prepared questionnaire survey on it and Relative Importance Index were used for the purpose of ranking. Delay in payment progress, Complexity of Project, Risk and uncertaininty related to project, Change in design, change in scope are the cost overrun parameter and Low skill labour, non performace of contractor/subcontractor, Risk and uncertaininty related to project are time overrun parameter.**[6]**

Jose et al. (2017), carried out the preliminary survey which identified the factors affect the quality performance. The SPSS analysis of the parameters determines the mean score and variance and the essential success and failure factors. The negative attitude of PM and project participants, the weak management of manpower resources and the labor force, the harsh environment at the site, the vested interest of the client representative in not completing the project in time, the keeping of key decisions in abeyance, the disputes between the team members, the PM and the top management, the lack of prompt decision-making by the top management was found to adversely affect the efficiency of the project.**[8]**

Asadi, S. S et al. (2018), carried out research on residential construction and find major and minor factors affecting to the project. He uses severity index and frequency index and done the important index for the ranking of delay. He finds major and minor factors are the shortage of labour, productivity of labour, weather condition, disputes between parties, inflation.**[2]**

Haslinda et al. (2018), findings showed that over time, the most prevalent factors were due to design changes, insufficient preparation and scheduling, and low labor productivity. Meanwhile, the primary causes of cost overrun were inadequate before-construction budget and material cost planning, wrong quantity take-off, and inflation-increased material costs.**[5]**

Kabirifar et al. (2019), studied the factors affecting EPC project performance. He identified the poor design, poor project planning and estimation, insufficient stakeholder engagement, dispute, poor site supervision, Changes in project execution, Late delivery of onsite materials, bad quality of construction materials, Redo of deficient tasks, inefficient equipment or machinery, Sub-contractor's poor conditions, Skilled workforce, Changes in workforce, Accidents or incidents, Excessive bureaucracy and Inclement weather in different phase of engineering, procurement and construction. In this, he used TOPSIS method.**[9]**

Table 1 Major Factors from Literature Review

Authors	Delay in Land Acquisition	Delay in Supply	Shortage of labour	Productivity of Labour	Change in design / scope of work	Performance of Contractor /Subcontractor	Wastage of Material	Inflation	Utilization of PPE	Knowledge/ Training	Safety Attitude / Behaviour	Healthy and Safe Practice	Legislation	Conflict among project participants	PM's ignorance and lake of knowledge	Conformance to codes and specification	Climate Condition	Cost of Quality	Meeting with requirement of stakeholder	Attribute of building	Stakeholder experience	Confidence in construction team	Effective communication and decision making
Teo et al. (2005)										*	*	*											*
Jha et al. (2006)														*	*	*	*						*
Al Haadir et al. (2011)									*	*	*	*											*
Shirouvehzad et al. (2011)									*	*	*	*	*										
Ghoddousi et al. (2012)		*	*		*												*						*
Salim S. Mulla et al. (2015)	*	*		*	*		*	*						*									
Shanmugapriya et al. (2015)														*	*	*	*	*					
Dinesh Bhatia et al. (2016)		*	*		*									*			*						
Leena Mali et al. (2016)		*	*	*	*	*		*						*			*						
Mandar C. Borse et al. (2016)		*	*	*	*	*	*				*												
Naveenkumar.G.V et al. (2016)		*		*		*	*	*															
Prof. Yogini K. Patil et al. (2016)			*		*		*	*						*	*								
Piyush et al. (2016)																				*	*	*	
waghmare et al. (2016)																			*	*	*	*	*
Jape et al. (2017)	*	*			*	*	*			*				*	*		*	*					
Jose et al. (2017)														*	*		*						
Asadi, S. S et al. (2018)		*	*	*	*	*		*	*					*			*						
Haslinda et al. (2018)			*	*				*									*				*	*	
Kabirifar et al. (2019)		*	*		*	*					*						*				*	*	

III. MAJOR FINDING FROM LITERATURE REVIEW

According to above literature review there are many points, that gave the focus on attributes affecting the success of residential project. Major finding from above are listed below: -

1. Majority of Authors done questionnaire survey and the Analysis in SPSS by doing mean, standard deviation, variance and used RII and IMPI methods.
2. Very few authors have used Analytic Hierarchy Process It is involving determination of attributes value and their weights by applying AHP.
3. Delay in land acquisition, delay in supply, scarcity of labour, productivity of labour, change in design, change in scope, performance of contractor/subcontractor affecting the time.
4. Unsafe practices, poor attitudes of construction worker, and lack of safety knowledge and training of workers, lack utilization of personal protective equipment, ignorance of workers on work procedures, lake of implementation of legislation are factors affecting safety during construction.
5. Equipment cost, wastage of material, material cost, labour cost, overhead cost, inflation are costs that mainly affect during construction.
6. Quarrels among project participants, weather condition, ignorance & lack of knowledge of project manager, Conformances to codes and specification, Cost of quality are factors affecting quality.
7. Meeting with requirements of stakeholder, Attributes of building, Stakeholder experience, Confidence in construction team, Effective communication and decision making are the main factors affect during construction.

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