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Project's Success Factor in the Building Construction: A State of Art Review

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Abstract- For the growth of the economic sector and to support future development, the construction industry plays a vital part in providing employment. Completion of projects is also hence most important. Common issues faced by most projects, mainly government-subsidized, are suffering delays and budget overruns. The vital part of the project is to complete it within the expected schedule, and a budget with the expected value through effective project management. However, in reality, several traits of different types and periodically a variety of restrictions are involved, which must be managed successfully by overcoming several problems. The core objective of project management is to perform the project on schedule and enclosed within the financial plan. Cost, schedule, performance, and safety are the four inevitable objective achievement metrics that have continuously assisted as the base for project success measurement in construction. Schedule-based building project management is still a novel model and watchword in the Indian construction sector. The main factors influencing performance currently include the knowledge fields of project management. If a project is finished on time, as planned, and with stated quality, it is deemed successful. However, as success is variable and hard to agree upon, assessing project success is a challenging task.

Keywords: Construction Management, Cost, Schedule, Scope, & Success Parameters.

1. Introduction

The core objective of project management is to execute the task on schedule and within the financial plan while sustaining the necessary level of quality. In many projects, the construction sector combines uncertainty and risk. However, in practice, a variety of different attributes and limits arise from time to time that must be properly controlled by getting over several challenges. The accomplishment of the building project involves several variables and features of several categories, all of these effects, cost, schedule, performance, and safety are four widely recognized that have always been the core component of project success evaluation. Effective safety management techniques contribute strongly to enhanced project performance. Financial aspects are very effective parameters to increase project performance [1].

The integration of the project on time and within budget while maintaining the desired level of quality are crucial components. The task of planning and scheduling requires a great deal of knowledge and experience to ensure that the project is carried out successfully [2]. The construction sector is important for economic growth and is a major job-creating platform that will support future growth. Given the volume of infrastructure being developed nowadays, and the fact that India is a growing country, a construction project manager is able to manage, control, and oversee the construction operations. Time delays and cost overruns are frequent problems, especially for government-sponsored projects. The most recent research from the Project Management Institute (PMI) reveals, that more projects are being completed for the first time in five years & completing within less than sanctioned budget, also this is endorsed by NBM&CW July 2017 bulletin.

1.1. Significance of Construction Project Manager

A construction project needs to be planned, executed, monitored, controlled, and completed effectively. The project manager caries main responsibility for the same. Additionally, daily operations, and client relations, update top management and clients about current status of the project.

In the construction engineering, project managers are answerable for more than just time, cost, and quality. Additionally, they are there to monitor every aspect of the project build that is necessary for it to succeed. A construction project manager who is successful will make sure that their team adheres to budgetary constraints, targets, and deadlines.

2. Literature Review

Common success attributes that influence the project are listed below:

1. The creation of project plans, as well as the selection of deliverables and significant checkpoints.
2. Appoint the project team; knowledgeable individuals must be deeply involved in the planning stage.
3. Support in terms of money and supplies.
4. The performance and prior experience of the project manager.
5. Participation of the client.

6. The project manager's technical expertise. Creating technical specifications as well as project management techniques.
7. Provide enough equipment, personnel, and administration.
8. Sufficient funding for completion.
9. Constant collaboration in the project.
10. Project evaluation involves periodic progress meetings.
11. The project's urgency.
12. Community participation [3].

The reviewed literature is summarized in the following cluster:

2.1. Public construction project

The following are the key causes of schedule delays: The service provider's financial capability, the owner's financial challenges, delay payment, the contractor's tools/equipment accessibility, and Poor Performance Using the Quantitative Statistical Method in Schedule Delay [4]. the reasons that Uganda's social region construction projects have run late and are over budget are: variation in the scope of the work, delayed payments, inadequate monitoring and control, the immense cost of capital, and political unrest and alteration were listed as the top five reasons for delays [5].

Because it necessitates economy, ability, quality, fairness, and clarity, completing public building projects successfully is challenging. A questionnaire-based assessment found 36 success factors. Understanding and following rules and regulations are the most important aspect of overall performance [6]. The roots behind Saudi Arabia's large-scale major construction project overrun- The main roots of delays were the approval of plans, the standby in paying contractors, and the causing cash-flow glitches throughout construction. Further factors that contributed to the delay were design modifications, scheduling issues with subcontractors, the owners' organizations' executive bureaucracy, delayed decision-making, design flaws, labor scarcity, and workers with insufficient skills [7].

The construction industry in emerging nations like Thailand faces problems like a lack of resources brought on by clients and professionals as well as the carelessness of the contractor [8].

2.2. Schedule delay

30 organizations in the Singapore construction industry participated in the survey, which exposed that the completion of 220 traditional projects and 96 eco-friendly projects fell behind schedule by 15.91% & 32.29%, respectively. The top 5 reasons for the delay summarized as: The quickly decision-making of the clients, the promptness with which decisions are made by all project crews, coordination and communication among key

players, the level of proficiency of consultants, and complications faced by contractors in raising project funds [9].

In Malaysia, it was stated that in 2005, 417 government treaty projects were reflected as bizarre (with more than 3 months of delay or abandonment) [10]. Time overruns occur on about 70% of Saudi Arabia's large projects. It was discovered that projects typically run 10 to 30 percent longer than planned [7]. In Australia, it was on record that only 8% of construction projects were completed by the deadlines, and a typical 40% time overrun occurred during construction [11]. Successful project management is affected by time-cost trade-off issues because crashing an activity guarantees time savings but raises costs [12].

The success of a project in terms of time, cost, quality, and security is negatively impacted by construction delays, which are among the most frequent issues in the business. The huge threat of overruns has not faded in regard to new types of construction projects. The last few decades have seen an increase in research into environmentally friendly construction. Moreover, many such analyses have only focused on the detrimental impact overruns have on every aspect of the construction process, which has yet to be felt by suppliers of raw materials. There have been multiple attempts to develop a guidance statistical model to modify the floats and finances of the schedule plan. [13][14][15][16].

2.3. Quality, performance, size, and structure

The success of a project depends on the design and execution of a strong organizational structure. The primary elements influencing the project organization's size and structure.

1. The successful integration of construction projects depends on the design of an effective and efficient organizational structure.
2. The size and structure of project organizations are influenced by a number of factors [17].

The conflict among project participants, the unfavorable socioeconomic environment, the severe weather, the project manager's inexperience and ignorance of experience, the poorly conceived project, and the fierce clash along the tendering process were the factors that badly influence the quality performances of projects [18]. The proper allocation of scarce resources is made possible by the identification of demanding factors for construction project success. The performance of the project's budget, schedule, quality, and overall success are addressed by critical success factors [19]. Successful safety management procedures contribute favorably to enhanced project performance [20]. Build time is getting more and more important because it is essential for assessing a project's success and efficiency of the project [21].

Construction industry performance issues in emerging economies can be divided into three categories: issues relating to resource availability (primarily supply of resources), issues relating to clients and consultants, and issues relating to contractor inability/inadequacy [8]. Failures in massive construction projects are common due to several number of variables, including unskilled designers and contractors, unfortunate valuing, ineffective change management, and social, technical, site-related, and other issues [22]. Overseas projects are more complicated and dynamic than domestic projects because they usually involve major external uncertainties

including political, economic, social, and cultural uncertainty as well as internal uncertainty that arise within the project [23].

Factors influencing the habitat (environment), structure, and behavioral patterns are (such as monetary conditions, technological advancement, government participation, sustainability features, investor involvement), (such as project status, attainment set-up, management methodology, conversation procedure, decision forging approach), and (e.g. expertise, bounded rationality, alertness, and view point) respectively [24]. Large construction projects are inherently dynamic and complex. It is challenging to give a thorough explanation of how to successfully manage such projects. These success elements can be categorized into four groups based on factor analysis: comfort, competence, commitment, and communication [25].

2.4. Contractor

It is suggested that contractors concentrate on building timelines, cut down on delays, keep a steady staff, and develop relationships with subcontractors in order to increase performance [26]. The project performance in China would be influenced by variables including inadequate communication, excessive partner involvement, loyalty to common goals, staff empowerment with authority, excessive partner demands, and early contractor involvement [27]. The human resources division of an organization is one of the most crucial elements in its success [28].

2.5. Project Manager

The phrase "project success" is thought to be distinct from "project management success." Project management success is determined by fulfilling the project's scope, budget, and time deadlines as well as other standard performance indicators, whereas project success is determined by the project's overall objectives [29]. The three characteristics of this element mostly point to the ignorance of the project manager as their common trait. A project manager won't be able to recognize and keep track of the crucial tasks that must be completed in order to meet the timeframe due to a lack of planning tools and knowledge. Due to his ignorance of operating procedures, which causes the project to take longer than expected, he won't approach upper management for assistance in a timely manner. The competence of project management should not be compromised by contracting organizations because a project might be ruined by a PM who lacks expertise and is uneducated [30]. Performance measurement in the construction industry is essential because of its influence at the world economy. Achieving higher performance levels in construction, therefore depends on effective project management [31].

The association between cross-cultural interaction and continuous excellence in Taiwanese construction partnerships. It was discovered that these factors, like the four essential failure factors, are similar to one another: Lack of professionalism in management, insufficient environment, lack of trust, shortage of flexibility, and lack of trust [32].

2.6. Indian Construction Projects

By discussing with professionals and working engineers in addition to reading the literature. By positioning, the factors according to the mean value of the respondents, the top 5 factors out of 53 factors were determined. The most significant factor was the absence of major activity inspection during execution, technical support from project workers and engineers, owner, consultant, and owner communication, resource documentation system, and planned resources obtained during work [2]. Estimated seven elements that could significantly affect the outcome including the project participants' dedication, the owner's expertise, Project participant conflict, and project participant coordination.

Peripheral causes, which are usually further on the control of project teams, may include negative climate environments, unpredicted ground situations, market yo-yoing, and revision in code of practice while inner causes may be spawned by the client, designer, service provider, consultant, as well as discrete contractors who arrange for labor, material, and equipment [7]. Any one of the three iron triangle vertices—time, money, and work quality—are significantly correlated with project management maturity; however, the customer satisfaction dimension is not one of them. Top management support and a committed project manager, two moderate variables, significantly affect the time success dimension [33]. The Table 1 below shows the summary of project's success factor at international level:

Table 1- The summary of project's success factor at international level

Author & Year	Reference no.	Study Region	The following factors are noted to have a substantial impact on the project									
			Client/Owner needs competence, and satisfaction	Contractor financial capacity/Competency	Coordination/ Communication	Cost/Budget constraints, Quality, and Time	Decision/Conflict resolution	Delay in payment	Design/drawing changes	Funds/Resource management	Project manager Experience /Knowledge	Size and structure	Skilled/Unskilled staff availability
Hughes et. a1 (2004)	[34]	Alabama	✓			✓				✓			
Akmam Syed	[24]	Australia			✓		✓				✓		

Zakaria et. a1 (2018)												
Berssaneti et. al (2015)	[33]	Brazil				✓				✓		
Bagaya et. al (2016)	[4]	Burkina Faso	✓	✓				✓		✓		
Demirkesen et. al (2017)	[31]	California			✓	✓				✓		
Ling et. al (2006)	[35]	China	✓			✓						
Chan et. a1 (2002)	[21]	Hong Kong, China			✓	✓				✓		
Chan et. a1 (2004)	[36]	Hong Kong	✓				✓					✓
Chan et. a1 (2002)	[37]	Hong Kong				✓	✓					
Atkinson et. a1 (l999)	[38]	Dorset, UK				✓						
Prabhakaran et. al (2022)	[39]	England, UK				✓					✓	✓
Belay et. al (2021)	[40]	Ethiopia		✓		✓				✓		
Sweis et. al (2013)	[41]	Jordan					✓		✓	✓		✓
Kim et. al (2009)	[23]	Korea	✓	✓								
Nasir et. a1 (20l2)	[42]	Malaysia		✓						✓		✓
Sambasivan et. al (2007)	[10]	Malaysia		✓	✓			✓		✓		
Ibrahim Mahamid et. al (20l2)	[13]	Pa1estine			✓			✓	✓	✓		
Assaf et. al (2006)	[7]	Saudi Arabia		✓	✓		✓	✓	✓	✓		
Hwang et. a1 (2013)	[9]	Singapore		✓	✓		✓				✓	
Jin et. al (2006)	[27]	Singapore			✓	✓						
Hollings et. a1 (l999)	[19]	Singapore		✓	✓	✓	✓		✓	✓	✓	✓

Chen et. al (2008)	[32]	Taiwan				✓			✓			
Chou et. a1 (2013)	[43]	Taiwan, Indonesia , and Vietnam	✓		✓				✓			
Arefazar et. al (2022)	[44]	Tehran, Iran	✓		✓				✓			
Ogunlana et. a1(1996)	[8]	Thailand	✓	✓					✓			
Genc et. al (2021)	[45]	Turkey				✓	✓	✓		✓		✓
El-Sayegh et. al (2016)	[17]	UAE	✓			✓					✓	✓
Xiao et. a1 (2003)	[26]	UK		✓		✓		✓				
Nnaji et. al (2021)	[46]	USA	✓			✓					✓	✓
Arditi et. al (2015)	[47]	USA				✓		✓				
Babu et. al (1996)	[12]	USA				✓						

Similarly as above table the Table 2 below shows the summary of project's success factor at national level:

Table 2- The summary of project's success factor at national level

Author & Year	Reference no.	Study Region	The following factors are noted to have a substantial impact on the project									
			Client/Owner needs competence, and satisfaction	Contractor financial capacity/Competency	Coordination/ Communication	Cost/Budget constraints, Quality, and Time	Decision/Conflict resolution	Delay in payment	Design/drawing changes	Funds/Resource management	Project manager Experience /Knowledge	Size and structure	Skilled/Unskilled staff availability

Tabish et. al (2011)	[6]	India	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Jha et. al (2006)	[18]	India	✓								✓			
Iyer, K et. al (2017)	[30]	India	✓		✓		✓				✓			
Vidhyasri et. al (2018)	[2]	Tamil Nadu, India			✓					✓	✓		✓	

3. Conclusion

If a project is finished on time, as planned, and with stated quality, it is deemed successful. However, as success is variable and hard to agree upon, assessing project success is challenging task. Usually, the total accomplishment of project objectives and expectations constitutes project success. The main factors influencing performance currently include the knowledge areas of project management also Schedule-based construction project management is still a fresh concept and phrase in the Indian construction sector. Usually it is observed that Indian construction industry rely upon cost and scope base completion, rather than schedule based. The trend required to be corrected as quickly as feasible. The literature results shows that project managers and contractors should pay sufficient attention to assure project success. Based on schedule adherence the following factors are summarized from various literature study have a substantial impact on any project:

1. A well-timed and valuable judgement by the project manager and staff.
2. Adequate communication among all project members.
3. Accessibility of resources (funds, equipment, wares (materials), etc.) as applicable through the project.
4. Consistent quality assurance and quality control activities.
5. Project manager with identical project experience.
6. Rapid conflict settlement by shareholders of the project.
7. The owner’s needs should be thoroughly understood and defined.
8. Timely confirmation of specified engineering plans and drawings.

Project managers undoubtedly add significantly to the success of construction projects. They maintain the project's progress and ensure that everything runs smoothly at all times.

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