IDENTIFYING CRITICAL SUCCESS AND FAILURE FACTORS IN CONSTRUCTION PROJECTS IN NIGERIA

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Abstract

Understanding those factors that contribute to success and failure of construction projects is crucial. Yet, empirical evidence on these factors remains scarce within the developing countries. This study seeks to identify the critical factors contributing to successful delivery of building projects within the Nigerian construction industry. The Mean Item Score (MIS) ranking revealed the most critical success and failure factors in relation with projects within the construction industry. While timely disbursement of payments, availability of resources as well as competency of contractors are adjudged most critical to construction project success, inadequate machinery and manpower, poor remuneration and dearth of professionalism are seen as most detrimental to effective project performance. Given the significance of these factors, improving attention on them is considered indispensable for successful delivery of construction projects.

Keywords: Critical failure factors, critical success factors, construction industry, project delivery, Nigeria.

Introduction

That factors such as globalization, technology, urbanization and industrialization tend to influence construction projects is well known (Linhard & Larsen, 2016; Sinesilassie, Tabish & Jha, 2017). Construction industry is sensitive and multifaceted due to the influence of project management actions, external environment, and human-related factors (Chan, Scott & Chan, 2004). A construction project has a high-value, time bound activities, with predetermined performance objectives mostly defined in terms of quality specifications, time, cost and other managerial constraints (Atkinson, 1999; Alzahrani & Emsley, 2013). Identifying those attributes that are responsible for project achievement and those factors that obstruct project objectives have been the central theme of construction research works over the years. So far, socio-political environment, relationships among stakeholders, competences of project managers, designer, and contractor, economic condition amongst others have been found most critical in respect of achieving construction projects objectives (Chua, Kog & Loh, 1999; Chan, Scott & Chan, 2004; Tripathi & Jha, 2018).

With the increasing uncertainties in technology, budgets, and development processes, this field becomes increasingly complicated, complex and challenging. The complexities in emerging construction projects and team dynamics necessitated the need for novel strategies towards attainment of process effectiveness in the industry. The construction industry complications have been attributed to its nature as high risk, high value, competitive and project oriented business. This creates the need to take a cursory look into these challenges and find inward solutions. Hence, identifying critical success and failure factors is critical towards improving the effectiveness of project processes. In Nigeria, the increasing use of projects management system has resulted in improved project delivery especially in the private sector. Nevertheless, the industry is still plagued with issues such as building collapse, poor workmanship, low engagement of professionals by clients, incessant project delays, abandonment and cost over-run (Nzekwe et al., 2015; Ogunde, et al., 2017; Ikudayisi, Adegbehingbe & Oviasogie, 2018). With little or no care for novel methods and construction procedure, infrastructural developments continue to increase in Nigeria due to growing demand propelled by rapidly increasing population. This has heightened failure in construction industry in the country.

Lots of controversial issue of discuss abound on building project success. The question remains what constituted or defines success in construction projects (Atkinson, 1999; Jugdev & Muller, 2005; Ika, 2009, 2012; Ikudayisi & Oviasogie, 2020). From the stance of Chan & Chan (2004), it is unlikely to have a common set of criteria for determining project success since “*success means different things to different people*”. Opinions abound on the factors that are critical to the success and failure of a construction projects often referred to as critical success factors (CSFs) (Chua, Kog & Loh, 1999; Koutsikouri, Austin & Dainty, 2008; Toor and Ogunlana, 2009; Ajayi & Oyedele, 2018) or critical failure factors (CFFs) (Jha and Iyer 2006; Sinesilassie, Tabish & Jha, 2017). Han, Yusof, Ismail, & Aun (2012) defined success factors as those factors that influence, constitute as well as determine the success of a project. Cooke-Davies (2002) regard SFs as inputs into the management system that lead directly or indirectly to the success of the project. Other definitions of SFs include factors which are necessary for the project participants to achieve their goals in a project (Sanvido et al., 1992; Cooke-Davies, 2002); the elements or activities required for ensuring the success criteria of the project; components of quality

assurance to guarantee success criteria. On the other hand, Zuofa and Ochieng (2014) referred to critical failure factors in construction projects as factors that hinder projects from meeting their targeted cost, time, or scope. Many studies have investigated the critical success factors (CSFs) for delivering construction projects (Koutsikouri, Austin & Dainty, 2008; Hwang and Leong, 2013; Molwu, Erdogan & Ogunlana, 2017; Tripathi & Jha, 2018; Ajayi & Oyedele, 2018).

Empirical wise, Doloi (2009) found that the choice of contractor(s) has a significant impact on the success or failure of a project. Garbharran, Govender, and Msani (2012) in their study grouped critical success factors in construction industry in South Africa as comfort, competence, communication and commitment. From the findings of Cheong and Emma (2012), the scope, quality, team, communication, risk, and change variables affect project success and also have a strong influence to predict project success and failure. Sinesilassie et al. (2017) examined the critical factors affecting schedule performance and concluded that 'owner's competence' can significantly contribute to performance while factors such as conflict among project participants, poor human resource management and project manager's ignorance and lack of knowledge are detrimental to Ethiopian's construction projects. Factors such as project manager's competence and commitment of all project participants were also established by Iyer and Jha (2005) as CSFs in Indian construction industry.

In UK, Hardcastle, Edwards, Akintoye, and Li (2005) in their study identified five CSFs for public private partnership (PPP) projects. These factors include effective procurement, project implementation ability, government guarantees, favourable economic conditions, and the available financial market. Establishment of conflict resolution strategy, willingness to share resources among project participants, clear definition of responsibilities, commitment to win-win attitude and regular monitoring of partnering process prove to be essential in bringing successful outcomes to partnering projects. The success factors for time performance were examined by Jha and Iyer (2006). The top three factors include project manager's competences, supportive owners and top management, as well as monitoring, feedback, and coordination. Toor and Ogunlana (2009) found top three critical success factors to be related to project planning and control, personnel management, and client commitment. Based on review of relevant studies, Chan, Scott & Chan (2004) categorized CSF into five groups namely project-related factors, human-related factors, project procedures, project management actions, and external environment. Koutsikouri, Austin, and Dainty (2008) identified thirty-one CSFs and grouped them into four namely management factors, design team factors, competencies and resources factors and project enablers.

Few studies have attempted examining CSFs within the construction sector in Nigeria. Odusami, Iyagba, and Omirin (2003) examined how team leadership and team composition influence project performance in Nigeria. A study by Amade, Ubani, Omajeh and Njoko (2015) assessed the critical success factors for public sector construction projects in Owerri, Nigeria. The critical success factors examined include efficient and effective procurement process/method, effective communication management, adequate planning, leadership skills of the project manager, weather conditions, and effective coordination of project activities. Out of all, only adequate planning had a significant influence on the success of public sector construction projects in the study of Amade et al. (2015). Nwekwe, Oladejo and Emoh (2015) identified CSFs for the

successful project implementation in Anambra State, Nigeria as management factors, project planning, technology, structure, business environment, geographical and climatic factors, economic factors, while the CFFs are lack of continuity, social factors, administrative excesses, and dearth of skills. Babalola, Oluwatuyi, Akinloye and Aiyewalehinmi (2015) focused on factors affecting construction project performance in Akure, Nigeria. Based on average index ranking, top CSFs identified include labour and materials factors (such as material prices, adequacy of supply of materials, quality of materials), payment of contractors, motivation of skill team, consultant's commitment, project leader's technical skill, management actions as well as economic situation.

On the other hand, CFFs has also been identified by scholars. For instance, Jha and Iyer (2006) study revealed top three failure factors affecting quality as conflict among project participants, unfriendly socio-economic environment, and severe climatic conditions. Zidane et al. (2015) found management and coordination, quality issues and error, administration and bureaucracy, decision issues and waiting as the crucial delay factors for projects. Use of inferior tools and methods, inexperienced staff, poor project planning and coordination procedure was established by Mitra and Tan (2012) in Saudi Arabia as CFFs. In Ethiopia, Sinesilassie, Tabish and Jha's (2017) study segregated 35 project performance attributes into six sets of success attributes and failure attributes. It was observed that conflict within project stakeholders, poor human resource management and low knowledge of project manager are most detrimental to delivery of Ethiopian's public construction projects. A study by Doloind and Leong (2013) identified factors such as planning and scheduling deficiencies, construction methods/techniques, ineffective monitoring and feedback process, complexity of design and construction as well as improper control over site resources as failure factor affecting cost performance. In Nigeria, Elinwa and Buba (1993) found top three failure factors affecting cost performance to include the cost of materials, price fluctuations, and financing/ payments for completed work. Ikudayisi, Adegbehingbe and Oviasogie (2018) identified and categorized CFFs for design consultants on construction projects into five themes namely operational challenges (delayed integration of participants, soft conflict among participants and communication bottlenecks), professional competency challenges (lack of creativity, thoroughness and commitment), client related challenges (delayed payment of fees, inadequate resources and management actions), institutes' challenges as well as societal challenges (corruption, economic condition)

Given that those CSFs and CFFs influencing project success might vary markedly considering different socioeconomic and uneven level of globalization among developed and developing countries. It is important to study the factors affecting the effectiveness of construction projects in the developing countries like Nigeria. Thus, the objective set for the study is to identify the critical success and failure factors affecting project delivery in Nigeria. Understanding these factors can significantly contribute to the level of construction effectiveness as they have implications for the human resource development and competency profiles of the construction industry.

Method

This study involves a survey of multi-disciplinary stakeholders in the Nigerian construction industry. The research population covered project stakeholders including the client's

representative, consultants and contractors within the construction industry in Nigeria. This study was conducted in Ibadan, southwest, Nigeria. Ibadan is the capital city of Oyo State and one of the most populated cities in Nigeria. The choice of Ibadan is vindicated on the fact that large numbers of building projects are being executed within the city in recent times. Research data was collected through questionnaire survey. The questionnaire survey approach was considered suitable here since the research objective is to assemble data from experienced personalities within the construction industry. The questionnaire was developed based on the review of prior studies on CSFs and CFFs presented in the introductory section of this paper. The critical factors identified were adopted and modified to suit the Nigerian construction industry's context. A total of 13 CSFs and 11 CFFs were examined in this study.

The questionnaire is sectioned into three. Section A includes background information of the respondents; section B comprises question on the critical success factors while the section C focuses on critical failure factors. Responses on the relative effects of these attributes were sought on a five-point ordinal/Likert scale (such as 1-not important; 2-fairly important; 3-averagely important; 4-important, 5-highly important). Factors were ranked based on their level of importance and severity using the mean item score (MIS). Consequently, the factor with the highest MIS is ranked 1st with other following in the descending order. The survey was sent to 180 respondents distributed among practitioners and stakeholders in the construction industry. Out of the 180 questionnaire sent, a total of 120 were retrieved and found useful in the study. The participants were randomly sampled across among clients, consultants and contractors.

Results

Respondents Profile

The percentage distribution of respondents (Table 1) shows that about 28% are in the client's representative, 39% of the population were consultants while the contractors constitute 33% of the population.

Table 1: Sectoral distribution of respondents

	Frequency	Percent
Clients	34	28.3
Consultants	47	39.2
Contractors	39	32.5
Total	120	100.0

From the result, the participants were male dominated as about 65% of the respondents were male while 35% were female. As shown in Table 2, most of the respondents are educated as almost three-quarter (70%) of them had one form of tertiary education (HND/PGD/BSc/PhD) or the other. This affirms that majority of the respondents are knowledgeable about construction practices.

Table 2: Educational level of respondents

Education	Frequency	Percent
SSCE	18	15.0
HND/PGD	26	21.7
B.Sc/ B. Tech	25	20.8
M.Sc./ M.Tech	24	20.0
Ph. D	9	7.5
Others	18	15.0
Total	120	100.0

Responses on years of experience showed that about 14% have between 1-5 years of experience, 19% with 5-10 years, and 76% had above 10 years of post-qualification experience. Over half of respondents (60%) had one form of professional affiliations. This distribution shows the level of participants' experience and familiarity with construction project delivery cum CSFs and CFFs.

Critical success factors (CSFs)

Using the item scale rating approach, the responses on the critical success factors were ranked based on their degree of importance as showed in Table 2. Although, most of the identified factors had close mean (MIS) values, however, some level of variations on scaling is apparent. The result shows that on the average, the respondents give priorities to some factors than others. From the results in Table 3, payment of necessary fees ranked first and represented the most important factor of all with the highest mean of 4.78. Owners' competence/commitment (especially as regards payment of fees) was found by Sinesilassie (2017) as critical factors affecting schedule performance of Ethiopian public construction projects. Babalola et al. (2015) found that timely payment of fees is a critical step towards minimizing construction works delays. This finding further suggests that disbursement of payment as and when due helps successful project delivery and thus serves as an effective tool within the building process.

The second ranked factor is availability of resources. This is consistent with Hardcastle et al. (2005) who assert that availability of required resources is a CSF for public private partnership (PPP) projects in the United Kingdom (UK). Similarly, Tripathi & Jha (2018) observed that resources availability is one of the leading factors for construction projects' success in India. Competency of the contractors ranked third. This is in line with Doloi (2009) and Alzahrani and Emsley (2013) who identified technical soundness of contractor as critical success factor for effectiveness of project activities.

Table 3: Critical success factors (CSFs).

S/N	PROJECT SUCCESS FACTORS	(5)	(4)	(3)	(2)	(1)	TOTAL	Mean	s.d	rank
1	Payment of necessary fees	96	22	1	1	0	120	4.78	.493	1 st
2	Availability of resources	93	26	1	0	0	120	4.77	.444	2 nd
3	Competency of the contractors	91	26	2	0	1	120	4.72	.582	3 rd
4	Commitment of the team	92	22	5	1	0	120	4.71	.585	4 th
5	Competency of the design consultants	93	22	3	0	2	120	4.70	.681	5 th
6	Favourable economic condition	81	32	7	0	1	120	4.62	.597	6 th
7	Commitment of building team	88	22	7	2	1	120	4.62	.747	7 th
8	Clients attitude and understanding	73	43	3	1	0	120	4.57	.590	8 th
9	Leadership of the team	86	23	3	6	2	120	4.54	.897	9 th
10	Communication between building team	82	28	3	5	2	120	4.53	.869	10 th
11	Topographic condition of site	80	21	15	3	1	120	4.47	.869	11 th
12	Climatic conditions	74	29	13	3	1	120	4.43	.847	12 th
13	Adequacy of meeting of the team	70	28	5	6	11	120	4.17	1.279	13 th

Note: 5-highly important, 4-important, 3-averagely important, 2-fairly important, 1-not important.

Put together, most contributing factors relevant to the CSFs are associated with human-related factors, procedures and project management actions. External environment ranked least among the identified factors (climatic conditions and topography of site) crucial to project success. Therefore, CSFs are determined majorly by inter-disciplinary team work of professionals as well as stakeholder's competence as corroborated by other scholars such as Chan, Scott & Chan (2004), Doloi (2009), Doloi (2010), Molwu, Erdogan & Ogunlana (2017). Prioritizing these factors is a strategic approach toward project success and their integration in project policy process will continual create opportunity for high performing projects.

Critical Failure Factors (CFFs)

Responses on construction project failure factors are presented in Table 4. From the result, "inadequate machineries and manpower by the contractors", had the highest means (MIS=4.54) which suggests the issue is most crucial failure factor in Nigerian construction industry. This has been observed in many prior studies. For instance, Long et al. (2004) and Islam et al. (2015) identified inadequate manpower, lack of skilled workers and improper techniques and tools as major setback to project performance. This is equally consistent with the finding of Alzahrani and Emsley (2013) which revealed that adequacy of plant and labour resources factor are statistically significant in predicting project success in UK. Doloi, Iyer, & Sawhney (2010) also identified poor labour productivity as a major factor contributing to failure of Indian's construction projects.

Items ranking second to fourth are "poor remuneration and clients support", "lack of professionalism of design team", and "low quality of design/specification". In support, Molwu, Erdogan & Ogunlana (2017) found that stakeholder engagement/empowerment has direct positive impact on project success. Sinesilassie et al. (2017) similarly observed that factors such as poor human resource management, project manager's ignorance and lack of knowledge are most detrimental to project performance. Poor remuneration and client support, poor

professionalism of the design team and low quality of design and specification are also identified by Ikudayisi, Adegbehingbe & Oviasogie (2018) as significant barrier to performance of project team. Hassanain, et al. (2017) found that the level of experience of the design team affects project success. Poor remuneration and lack of experienced construction managers were identified by Islam et al. (2015) and incompetency on the side of designers and contractors by Long et al. (2004).

Table 4: Critical failure factors (CFFs)

S/N	CFF	(4)					TOTAL	Mean	S.D	Rank
		(5)	(3)	(2)	(1)					
1	Inadequate machineries and manpower by the contractors	75	39	3	2	1	120	4.54	.709	1 st
2	Poor remuneration/ client support	70	44	4	2	0	120	4.52	.648	2 nd
3	Lack of professionalism of the design team	65	43	9	2	1	120	4.41	.772	3 rd
4	Low quality of design/specifications	64	45	6	2	3	120	4.38	.861	4 th
5	Environmental issues like topography, climate often cause setbacks in construction	70	35	7	5	3	120	4.37	.952	5 th
6	Contractors' attitude leads to building projects failure.	61	41	13	4	0	120	4.34	.805	6 th
7	Wrong method of selecting project team	59	45	12	4	0	120	4.33	.790	7 th
8	Lack of design time/ schedule	55	48	10	5	2	120	4.24	.898	8 th
9	Clients' unrealistic needs pose danger to construction, and affect building stability	60	37	13	6	4	120	4.19	1.040	9 th
10	Conflicts among stakeholders productivity in the construction process	62	31	11	13	3	120	4.13	1.122	10 th
11	Government policies hinder success of construction	54	37	13	6	10	120	3.99	1.233	11 th

Note: 5-highly serious, 4-serious, 3- moderate, 2- not serious, 1-not at all serious

Harsh climatic condition ranked fifth. Iyer and Jha (2005) equally noted this as a critical barrier to performance. The contractor's attitude as regards project failure ranked sixth. This is consistent with the stance of Doloi (2009) as well as Windapo and Rotimi (2012) who identified the use of substandard materials as the main challenge confronting building projects success, often resulting in building collapse. For many contractors, the primary goal on project is to maximize profit; this desire seemingly propels many of them into procurement of substandard materials, disregarding the importance of having high project quality. In addition, inappropriate selection of project team ranked next. Evidently, due to lowest-bidder selection approach commonly adopted in Nigeria, most projects are of low quality in design and construction. The use of inferior tools and methods as well as inexperienced staff thus has critical impact on projects. Client's unrealistic need, conflict of stakeholders and government policies ranked least among the failure factors on construction project in this study. In all, the outcome in this study suggests the need to pay more attention to the top failure factors in bid to improve project delivery in Nigeria

Conclusion

In order to enhance successful project delivery, the key factors towards achieving high performance were ranked using the mean item score in this study. These factors (CSFs and CFFs) were ranked in relation to their importance and their effect on construction success. This

finding underpinned key issues such as payment of fees, availability of resources and competency of contractors as fundamentals in successful project delivery. This study equally affirms that inadequate machineries and manpower, poor remuneration and lack of professionalism remain the dominant CFFs in the Nigerian construction industry. Given the significance of CFFs and CFFs, it is evident that factors herein identified have significant practical and training implications. It is very important that adequate knowledge on core aspects of professionalism, ethics compliance as well as teamwork dynamics be integrated into the training curricula of construction professionals. The development of the competent professionals and more informed clients is critical within the Nigerian construction industry. This study and its findings therefore, is expected to help clients' organizations and industry practitioners focus on critical factors as proactive measures toward optimum delivery of public construction projects. These factors are germane for successful project outcome in Nigeria. Construction stakeholders can use this ranking to determine how to allocate limited resources to fulfill the goals and obtain desired level of project success.

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