

Assessing the Effect of Strategic Planning on the Performance of Construction Projects: Evidence from Nigeria

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Abstract

This study aimed at assessing the effect of strategic planning on performance of construction projects in Nigeria. A quantitative research approach was adopted where the primary data was obtained through Internet mediated questionnaires targeting 100 personnel's of construction companies in Abuja, Nigeria. The findings of the study show that despite the pros of traditional project management approach, it is faced with lack of customer involvement, issues of risk management and undefined roles and responsibilities. It also shows that the agile method is not usually adopted; however adoption of a combination of both traditional and agile method is more suitable and effective to execution of construction projects. The study suggests that trainings and understanding of hybrid method should be carried out to create awareness of its advantages on flexibility and techniques that will improve the delivery of construction projects.

Keywords: Strategic planning, project management methods, quality standards, performance, construction projects.

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1. Introduction

All construction projects are unique, and involve several phases and stages, activities, complex methods, stakeholders and require huge expenditure, hence the need for proper planning (Ahmad & Namala, 2015). The major task of management is on project planning but it is more challenging to implement and properly manage these plans to work (Akinola et al, 2019). Construction projects necessitate proper planning in order to successfully manage both human and material resources (Ogunde et al, 2017). We can say that successful delivery of these projects are products of a well constructive construction planning and schedules that were put in place ahead of time (Akinola et al, 2019).

According to Lalmi et al. (2019), poor planning implementation leads to a requirement to make up lost time by unplanned compression of budgets and schedule, which happens in the majority of projects we see around us. Olaolu et al. (2017) also maintained that there are various activities, schedules and budget restrains associated with construction projects which need serious attention and carefully detailed planning ahead of the building production process. Regrettably, Akinola et al. (2019) confirmed that some Nigerian construction projects are frequently carried out without any formal planning, thus such projects are later confronted with some kinds of problems, ranging from exorbitant changes, cost and time overrun, low/or no profits and so on. In spite of the benefits that could have been generated by the construction industry, the aspect of planning cannot be said with all confidence that it is well practiced in most construction projects in Nigeria when compared to what is obtainable in the developed world (Akinola et al, 2019).

In construction projects, more difficult planning problems arise either from multiple projects that access one resource pool or external constraints such as stakeholder interests and environmental concerns. For many decades, tools such as Critical path method (CPM), Gantt charts, Work breakdown structures (WBS), and Programme evaluation and review technique (PERT) have been applied and have also maintained their role for construction project planning and estimations. However these simple techniques do not play sufficient respect to the complexity and sensitivity of the planning environment in construction projects (Lalmi et al, 2019). They are solely considered suitable for the determination of time windows for project activities (Lalmi et al, 2019).

In addition, following the recent outbreak of the coronavirus, it is clear that many industries have been affected one way or the other especially the construction industry that particularly requires workers on-site to perform activities or monitor work done correctly (Yaser & Alhagar, 2020). However due to the total lockdown, construction projects were affected by shortage of construction material supply, hike in prices of materials, loss of jobs, inability to pay salaries to mention a few (Yase & Alhagar, 2020). As a result of this, it is crucial to appreciate the efforts of how these construction industry address unforeseen changes that have occurred.

Therefore in order to foster a more effective approach in execution of projects, it is important to carefully review the management and implementation of projects to determine the most effective approaches and methods to adopt from the initiation to closing phase of every project in order to fulfill the requirements of the project. In this study, strategic planning is represented by the project management methods adopted in planning and executing projects namely; Traditional Project management (TPM), Agile Project management (APM) and Hybrid Project Management (HPM) while performance is represented by the quality standards of the construction projects. The

study assessed the effects of these methods on the quality standards of construction projects executed in Nigeria.

2. Literature review

2.1 Strategic planning defined

Strategic project planning is carried out at the top management level and is termed the master plan (Scott, 2015). At this level, planning focuses on the overall project objectives, strategic plan defines the scope and objectives of the project, identifies the methods and procedure to be adopted for the procurement of all consumables and utilities in the project. A variety of tools and techniques have been developed to enable managers in identifying and dealing with strategic decisions. The increasing pressure to deliver quality projects in a dynamic and continuous changing environment cannot be overemphasized (Ibrahim & Daniel, 2020).

Strategic planning in this study is represented by the project management methods adopted in planning and executing projects namely; Traditional Project management (TPM), Agile Project management (APM) and Hybrid Project Management (HPM) which are clearly defined below;

2.1.1 Traditional Project management (TPM)

According to PMI (2013), the traditional project management (TPM) is defined as the application of knowledge, skills, tools and techniques to project activities to meet project requirements. TPM is characterized by well-organized planning and control methods (Papke-Shields et al, 2010). In TPM, a project is expected to be exhaustively planned upfront at once through which the project manager and team are expected to follow in a linear process (Papke-Shields et al, 2010).

Although TPM emerged as a need to formally bring project management and control in large projects, it has proven to be an insufficient approach in the face of a dynamic project management environment because most construction projects do not follow a sequential flow as clients and other stakeholders usually find it hard to completely and correctly define the requirement of the project at the initial stage (Baird & Riggins, 2012). Other external factors may also occur which may hinder the project execution (Papke-Shields et al, 2010).

2.1.2 Agile project management (APM)

Agile is defined as the ability to act proactivity in a dynamic, arbitrary and constantly changing environment (Salameh, 2014). APM is a blend of Traditional methods, concepts and collaborative, flexible, adaptive to frequent change, yet highly disciplined practices (Alzahrani & Emsley, 2012). This approach is based on short delivery iterations accompanied by continuous learning (Salameh, 2014). At the beginning, the project team is expected to conduct a streamlined plan, define the requirements, and solution design to initiate the project, by which afterwards the project team is involved in subsequent waves of iterations that entail more detailed planning, analysis of requirements, design, execution, test and final delivery of the project to clients/stakeholders (Salameh, 2014).

Unlike the TPM, APM allows for immediate modification of the project as requirements are being reviewed and evaluated in each iteration. Hence it follows a feature-driven management approach which concentrates on defining the project scope and requirements with the crucial involvement of the clients to determine what needs to be built and establish priority functionality (Salameh, 2014). APM also put emphasis on collaborative development and management to deliver results, getting feedback from clients and continuous improvements of the project (Alzahrani & Emsley, 2012). However, given the advantages of the flexible nature of APM, it has yet proven to be suitable for mainly software development projects (Salameh, 2014).

2.1.3 Hybrid project management (HPM)

This is an approach where the planning and requirement phase takes up the TPM approach while the design; execution and evaluation phase employs the APM approach in carrying out a project (Alexander, 2020). HPM employs the thoroughness of Work Breakdown Structure (WBS) to specify requirements for the project and agile method is applied during the design, implementation, closure (Salah et al., 2017). Though we attain numerous benefits from traditional methods and agile methods, project managers are still facing many challenges while implementing large-scale projects (Conforto et al., 2014).

2.2 Performance of Construction Projects

The success of every construction project is the ultimate goal for every organization, which depends mainly on the success of the project performance (Amidu & Aluko, 2019). According to Thomas (as cited in Salameh, 2014) the main performance criteria of construction projects relies on its financial stability, the progress of work, its quality standards, health and safety of its workers, availability of resources as well the satisfaction of its clients. Adebisi et al. (2018) opined that the management commitment to continuous improvement of quality; training of all personnel on quality standards; and efficient teamwork to improve quality issues are generic factors that affect the process of project quality where failure to enforce quality assurance in construction projects affect the outcome of the entire project.

The emphasis on quality in construction projects is the ability to conform to established requirements of the project which is specified initially by the client (Salameh, 2014). In order to achieve these requirements, all parties involved in a project must undersand the expectations and incorporate them to carry out a successful project

(Salameh, 2014). The construction industry has also developed a variety of tools in measuring performance of projects such as total quality management (TQM), integrated performance index (Alzahrani & Emsley, 2012) and Key performance index (KPI) (Amidu & Aluko, 2019).

2.3 Theoretical framework

The Incremental Theory of Planning: This approach to planning or decision making holds that decisions are made not in the light of clear cut objectives, but through small adjustments dictated by changing circumstances. It is a means of “satisficing”, or settling, on a planning approach for a given problem following the “principle of bounded rationality” developed by Herbert Simon 1998. The premise behind Simon’s (1998) principle is that humans have a limited capacity for solving and understanding problems in comparison to the vast and expansive list of current and future obstacles that are trying to be resolved. As a result, we satisfy, “that is, settle for a course of action that is “good enough” for the purposes at hand”.

Flexibility is the major benefit of hybrid project management methodology and this is the major challenge of traditional project management methodology (Serrador and Pinto, 2015). For construction projects in a Nigerian environment, it is evident that there is need to have some level of flexibility given the numerous uncertainties that are likely to occur. Therefore this study chooses the incremental theory of planning for this reason.

2.4 Empirical review

Ibrahim & Daniel (2020) assessed the influence of 19 project planning processes on construction project success measured by project efficiency and project effectiveness. They also identified the most critical planning processes. They conducted a survey in 3 different construction companies in Abuja, FCT. By administering structured questionnaires, they analyzed the data with the aid of SPSS. The result of their findings show that Creation of Work Breakdown Structure (WBS), Program Evaluation Review Technique (PERT) or Gantt Chart, Project Schedule Network, Determine Budget and Quality Management Plan have the highest awareness and usage by the selected firms and WBS has been found to be the most significant planning process. Additionally, the correlation between total level of planning and project success $\rho(60) = -.493$ with $p=.032$, and between total level of planning and the efficiency component of project success $\rho(60) = .618$ with $p=.005$, were statistically significant, given $\alpha = .05$ (two tailed) while the correlation between total level of planning and the effectiveness component of project success was not statistically significant.

Ahmad & Namala (2015) overviewed the practical application of essential planning tools in Nigerian construction process. Their study reviewed existing researches and conducted interviews to determine the practices of their application. They concluded that not all contractors use planning tools and the few one that do mainly adopt the use of Gantt charts due to its simplicity. They also concluded that the cost of applying other tools is a militating factor. Akinola et al (2019) also evaluated the factors influencing construction project planning and implementation with evidence from south western Nigeria. With the aid of administered questionnaires surveys across various professionals in the construction industry. Relative Importance Index showed that type of client and type of project were the top two factors influencing project planning while insufficient finance and changes in client requirements were the top two factors influencing implementation of project plans.

Salameh (2014) took a comparison between agile project management and traditional project management methods. The research study compares and contrasts the APM with TPM in the five process groups and 10 knowledge areas defined in the Project Management Institute PMBOK (2013). Moreover, it compares the two methods in key management disciplines related to leadership style, communication, change, scope, and risk management. They study found that in spite of APM’s momentum in various industries, a great deal of ambiguity exists in defining the details of APM methodology, processes, tools, and approach, especially when being compared with traditional project management (TPM) methods and processes.

Chandrababu & Muddangula (2019) investigated and explored the adoption of hybrid methodology in projects. With the use of a qualitative research approach, they conducted 9 semi-structured interviews with 3 different companies consisting of project managers, team leaders and members who were working with hybrid methodology. They analyzed the practice of hybrid methodology in projects and its benefits and challenges. From their findings they concluded that hybrid methodology is in no doubt becoming popular but is still in its emerging stage, however it still brings success with the fusion of structured tradition approach and flexibility of agile methods. It also focuses on business value, time and costs estimations, customizing the project management methodology to the problem rather than using a single approach and enhancing the quality of complex projects.

Lalmi et al (2019) also examined a conceptual hybrid project management model for construction projects. The paper thoroughly reviews the available literature on different project management approaches and proposes a hybrid project management model for construction projects, presenting and discussing key traditional, and practices that seeks to promote change, boost interaction with the client and increase project value, by using the agile approach component to increase the probability of success of construction projects.

3. Methodology

Given the need to have a more flexible approach in construction projects in Nigeria. The study adopted descriptive research design. The research design was appropriate because it allows the collection, description, analyses and interpretation of data in order to make relevant inference. A purposive sampling technique was adopted to arrive at a population of study was targeted at 100 personnel's of construction companies located at Abuja, Nigeria. Roasoft statistic calculator was used to obtain a sample size of 80. The questionnaire was internet mediated to ease collection and was designed on a likert scale of 1-5 to fulfill requirements of the research objectives.

60% of questionnaires were obtained which is high enough for the study. A cronbach alpha test was carried out to test the reliability of data obtained. The results of findings are analyzed in percentages and are presented in the form of tables to ease understanding of the readers.

4. Data Analysis

This section represents the results of data generated from the questionnaires. The data was analysed with the aid of Microsoft excel. A cronbach alpha test of reliability was conducted to test the data generated and the result stood at 0.97 which means the data is fit and reliable for the study.

Table 4.1: Test of Reliability

No of items	Sum of item variance	Variance of total scores	Cronbach alpha a
26	27.28	391.90	0.97

Data obtained from the Research Questionnaire

Q1. Your experience with project management?

Table 4. 2 Years of experience in project management

0.- 5 Years	6 - 10 Years	11 - 15 Years	More Than 16 Years	Total
9	5	25	9	48

The table above represents the respondents years of experience with project management where the majority of them have between 11 to 15 years.

Q2. What position do you hold in the company?

Table 4.3 Positions held by respondents in their respective companies

Project manager	Consultant	Project team member	Management/Admin staff	Total
9	5	25	9	48

Majority of the respondents were project team members that comprised foreman, site engineers, procurement officers, Admin/Management staff etc. 17 of them are project managers/Asst. project managers that individually handle and supervise different construction projects of the company while the 5 consultants who are either engineers or architects that perform quality assurance checks in execution of the projects.

Q3. In your estimation, what percentage of the construction projects completed within your organization in the past 12 months used following strategic project management approaches?

Table 4.4: Question on perception of strategic project management approaches

Traditional approach is mostly a linear and plan based approach.	79%
Agile approach is mostly an iterative and incremental approach. Requirements and solutions of a project evolve during the project's life cycle.	4.17%
Hybrid approach combines both agile and traditional approaches focusing on taking the best from both of them.	16.7%
	48

From the table above, it shows that the majority of the respondents have mainly been involved in projects that were guided by traditional project management procedures in handling construction projects. That is the linear procedure of planning the project before embarking on it. while 2 respondents have experiences with the agile methods and 8 respondents with hybrid methods which is a combination of the traditional and agile approach of project management.

Q4: Kindly answer the following questions based on your experiences in construction projects.

Table 4.5: Questions on effect of activities and processes of the 3 project management methods reviewed in the study on quality standards of construction project delivery.

		Percentages of responses						
		SD	D	N	A	SA	TOTAL	
INITIATION & PLANNING (TPM)	1	At the initiation of the project a project management plan document (such as business case; project management plan; project scope requirement) to justify and to obtain the commitment and authorization of the management was presented to the stakeholders?	2%	2%	19%	31%	46%	100%
	2	Project risk and trade offs were well understood	4%	46%	2%	31%	17%	100%
	3	Roles and responsibilities were clearly defined	8%	52%	8%	19%	13%	100%
	4	Stakeholders assisted in meeting objectives and were updated on status in an adequate fashion	8%	19%	10%	25%	38%	100%
	5	Customers and their needs were clearly defined	0%	58%	6%	21%	15%	100%
	6	Customers were adequately involved throughout the project	0%	48%	10%	17%	25%	100%
PROJECT DESIGN, DEVELOPMENT (APM)	1	In the case of unforeseen circumstance (changes in Client's requirements, Global Pandemic, economic issue), the project plan gives rooms for flexibility and iterations without hindrance to the overall performance of the project?	4%	13%	15%	19%	50%	100%
	2	Appropriate specs or mock ups were provided to assist in planning	4%	31%	4%	25%	35%	100%
	3	Project goals were attainable within the timeframe	4%	27%	10%	27%	31%	100%
	4	Documentation was properly done and effective	0%	63%	2%	25%	10%	100%
	5	Quality Assurance testing was thorough and completed on time	2%	10%	29%	31%	27%	100%
	6	Changes were reasonable and prudent throughout development	2%	35%	10%	25%	27%	100%
	7	Team collaboration was high through out the project	0%	17%	15%	29%	40%	100%
PROJECT DELIVERY (HPM)	1	Project execution was effective, based upon established best practices, processes and tools	0%	31%	8%	42%	19%	100%
	2	Project was deployed in a reasonable timeframe according to scope?	4%	21%	4%	31%	40%	100%
	3	Training & Support was adequate and timely?	8%	42%	8%	23%	19%	100%
	4	Stakeholders and affected teams were properly informed prior to launch	0%	29%	13%	23%	35%	100%
	5	Delivery fallout was handled in a timely manner within teams?	8%	17%	13%	29%	33%	100%
	6	Commitment, leadership and information accuracy were increased?	2%	2%	19%	48%	29%	100%
	7	Customers' requirements and Other efficiency measures were achieved?	6%	19%	8%	40%	27%	100%

The questions above were formulated given the activities involved in strategic planning processes of construction projects as reviewed in line with the study. The first part, "Initiation and Planning" comprises questions that help us answer the research question as to whether traditional project management approach has an effect on quality standards of construction projects.

The second part is "project design and development" which comprises questions that will help us answer the second research question as to whether agile approach has an effect on quality standards of construction projects during and after its execution. The first and second part answers the third question as to whether adoption of HPM has a relationship with the quality standards of construction projects since it is a combination of both TPM and

APM. The fourth part represents “delivery” that is the overall performance of the construction projects on how it was executed.

4. Discussion

The section represents the analyses of the research questions.

RQ1: To what extent does Traditional project management (TPM) approach have an effect on quality standards of construction projects in Nigeria?

From the responses presented in table 1, it shows that majority of the respondents are in agreement that all project management plan documents required at the initiation and planning stage of projects are done and presented to the stakeholders involved. 38% of them also agreed that the stakeholders assisted in meeting the project objectives and were updated on project status in an adequate fashion. While 46% of the respondents disagree that the risk and tradeoffs associated with the projects are well understood by the stakeholders, 52% of them also disagree that role and responsibilities were clearly defined to each member of the project. Majority of the respondents are also in disagreement with clearly defined needs and involvement of customers in the project.

This shows that despite the strengths of TPM to define all the steps and requirements of a project before its execution, it also faced with few challenges. The assumption that once a phase a phase is complete, it is expected that it will not be revised (Salameh, 2014), shows the rigidity and strictness of the method. It also lacks the customers focal point as it doesn't give space customer's opinion in every development process until the project is ready (salameh, 2014). The construction project is characterized by complexity, whereas TPM is based on a linear approach that does not reflect the full complexity of projects (Lamli et al, 2019). The responses shows that there is also lack of risk and tradeoffs understanding as well as defined roles and responsibilities amongst the team. This is in line with Lamli et al (2019) study who mentioned that in TPM the project is isolated from certain environmental changes that are inevitable and unplanned; these changes could negatively influence the progress of projects.

RQ2: Does agile project management (APM) approach have an effect on quality standards of construction projects in Nigeria?

From the responses presented in table 1, the second part of the table asked on project design and development processes involved in a project. The APM possesses the ability to act proactivity in a dynamic, arbitrary and constantly changing environment (Salameh, 2014). It aims to create more sustainable customer value by eliminating waste through all company processes (Lalmi et al, 2019). From the result in Table 1, we can see that majority of the respondents agree that during the project design and development, the project task are well defined and well assigned and also achieved within the timeframe although 63% of the respondents believe that documentation in this approach is poorly done which makes it hard for new members to get up to speed. They also agree that the method gives room for changes, quality assurance testing was done thoroughly and team collaboration was high through out the project.

From the responses of the questionnaire, only 4.17% of the respondents are familiar with application of this method. Poor knowledge of application of complex methods in construction projects is also a contributing factor to the hinderance of usage of the Agile method (Ahmad & Namala, 2015).

RQ3: Is there a relationship between Hybrid project management (HPM) approach and quality standards of construction projects in Nigeria?

HPM as reviewed in the study is a combination of TPM and APM methods, where a complete project plan is required but the specific details of each sprint are not defined until the first sprint is completed (Salah et al., 2017). While many firms find it hard to efficiently use neither of the two approaches, recent research has found that many firms are now using a combination of both agile and traditional approaches for better support and execution of their project (Baird & Riggins, 2012). From the responses in Table 1, the section of Project delivery shows that in combination of TPM and APM, 42% agree and 19% strongly agree that execution of projects are more effective, based upon established best practices, processes and tools. However, 42% of the respondents believe training & support was not adequate and timely. This has always been a mentioned problem in managing construction projects in Nigeria given reviewed previous literatures. Ibrahim and Daniel (2020) believe that Continuous development seminars and trainings in project management should be organized for all professionals in the sector.

Majority of the respondents also believe that when a project is properly planned and executed, the outcomes will contribute to future projects based on lessons learnt; it will lead to addition new projects and open new markets for the companies. The projects also will develop better managerial capabilities and better the organizations direct performance. 75% of the respondents also believe that adoption of a more flexible approach to execution of projects will help improve future projects. According to lalmi et al, (2019) whose study proposed adoption of hybrid approach in construction projects, believe the model is effective and will increase the efficiency of project teams and overall customer satisfaction.

5. Conclusion

This paper assessed the effects of strategic planning on performance of construction projects where strategic plan was represented by 3 project management methods namely; Traditional, Agile and Hybrid project management methods. The following conclusions are drawn;

- a) Traditional method which adopts a sequential approach is still actively adopted and used in execution of construction projects. However it comes with a number of disadvantages such as lack of customer involvement, flexibility in execution process; Undefined risks and tradeoff; undefined roles and responsibilities of project teams.
- b) From the findings of the study, it is seen that majority of the respondents are not familiar with application of agile methods despite its advantages as reviewed in previous studies. Also previous literatures suggest that agile methods is mostly suitable for small projects rather than a complex project like construction projects.
- c) The finding suggest that adopting a more flexible approach will help in improving the management and delivery of construction projects. Therefore the hybrid approach which combines both tradition and agile methods is more suitable. This suggestion is also backed by previous literatures such as the works of Lalmi et al, (2019).

6. Recommendations

Given the above conclusions, the study recommends the following;

- a) The traditional planning of projects should be maintain but formulated to give room for customer involvement; flexibility to iterations due to uncontrolled environmental changes; proper attention should be given to risk management: and a more defined and assigned roles and responsibilities to project team member should be emphasized. This will lead to customer satisfaction and efficiency of project team members and improved overall execution of the projects.
- b) As agile method is little explored in the construction environment in Nigeria, there should be trainings and development seminars on project management methods and their implementation should be organized for professionals involved in construction projects.
- c) Given that the hybrid approach is more suitable to planning environment of construction projects in Nigeria, professional need to realize its characteristics and advantages; as organizations when trying to adopt new methodologies face challenges with team members who do not want to change from their previous ways of handling projects. Additionally, a verification of approach will be necessary in order to confirm the results obtained in the research.

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