

Exploring Strategies To Implement Project Management Tools And Techniques Among Startups In Nigeria

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Abstract

There is plethora of evidence in the literature linking the implementation of project management tools and techniques (PMTT) by companies to timely project execution, prevention of cost overrun and efficient project outcomes. However, existing studies have hardly focused on strategies which may contribute to the effectiveness of PMTT at startup companies. This study was motivated to close this knowledge gap. With a descriptive survey design, qualitative data were collected from staff stakeholders of startups based in Lagos, Nigeria. A purposive random sampling technique was used to select 10 stakeholders each from 10 startups, making 100 participants in the study. The retrieval rate was 100% as prior consent of management of each startup was sought before the instrument administration. The data were analysed using a mix of frequency counts, percentages and logistic regression. Findings revealed that performance-based strategy makes PMTT attractive to the company's employees while the structure-based strategy is more effective to sustain the stakeholder commitment to PMTT. Also, industry-based strategy is important to keep the company and its staff updated of technology-enhanced PMTT. It is therefore recommended that the startup firms should prioritize skills and competencies of staff while deploying the PMTT. More importantly, the firm's structure and culture should encourage the adoption and implementation of the PMTT by its stakeholders.

Keywords: PMTT, strategy, logistic regression, startups, Nigeria

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I. Introduction

Project management tools and techniques (PMTT) are generally introduced to optimize the operational relationships among various elements of the project (Rew et al., 2020; Muhammed and Santosa, 2019). The PMTT solidify the project's targets, consolidate the process to achieve the targets and infuse efficiency in the outcome of the project (Clemente and Domingues, 2023). The PMTT are particularly involved when dealing with multi-functional, complex projects whose outcomes influence the status and performance of the company (Rew et al., 2020; Tereso, 2019). However, the merits of PMTT are far from being realized if PMTT are introduced without evidence-based strategies (Orieno et al., 2024; Clemente and Domingues, 2023). These strategies are broadly explored in this study, with focus on the effectiveness of PMTT towards meeting the company's vision and mission. According to Orieno et al. (2024), PMTT without strategies are generally difficult to implement and are vulnerable to noncompliance from workers. A strategy is defined as the workable approach of making PMTT attractive to all stakeholders who are important to work through the project until completion (Clemente and Domingues, 2023). With a strategy in place, PMTT becomes a part of the organizational culture (Orieno et al., 2024). In other words, the company is systematically positioned to implement PMTT at every aspect of its operation, thanks to adoption of a strategy. In the context of this study, three strategies are explored: structure, performance, and industry.

The structure-based PMTT are those which integrate project management in planning, process and execution aspects of the company (Patricio et al., 2021; Hermida et al., 2016). They require that the company defines the job portfolios of its staff as involving rigorous application of particular groups of PMTT – no worker may deviate from the prescribed PMTT without the awareness of the management (Patricio et al., 2021). This top-bottom approach is helpful to moderate the staff behaviour towards using the company-preferred PMTT in their routine activities (Hermida et al., 2016). However, this strategy may be prone to limited acceptance by staff who may feel that their intuitions to innovate have been constrained (Hermida et al., 2016). Alternatively, the company may consider performance-based strategy whereby each worker applies PMTT as they consider them important for job performance (Al-Nabae and Sammani, 2021; Nusari et al., 2018). In this case, some PMTT may not necessarily be part of the company's structure before the worker deems them fit for implementation (Nusari et al., 2018). This strategy allows for workers' intuition in using the best PMTT to optimize their productivity (Al-Nabae and Sammani, 2021).

Unlike the structure-based strategy that preconditions the staff to use certain PMTT, the performance-based strategy loosens the workers to look around for workable PMTT to boost their own performance (Duarte et al., 2019). The core idea of performance-based strategy is value addition of the PMTT (Dasi et al., 2020). That is, the PMTT-compliant worker evaluates the PMTT's contribution to the project outlook before electing to implement them (Dasi et al., 2020). Furthermore, the industry-based strategy is one that opts for the PMTT as may be commonly adopted in the industry (Demagistris and Khan, 2020). This aligns the company's process with obtainable practices in other companies. A particular advantage of this strategy is that it predisposes the company and its workers to follow the industry trends and share knowledge with peers (Kanski and Pizon, 2023). Nonetheless, the industry-based strategy may stifle efficiency because the PMTT may be used on the basis of their popularity, not their contribution to the company's performance (Kanski and Pizon, 2023).

This study explores relative adoption and effectiveness of these strategies among startups in Nigeria. The remainder of this paper is organized into five sections. Section II takes a brief tour of the literature evidence on the stance and developments of project management in Nigeria. Section III offers the methodology adopted to collect and analyse the data. Section IV presents and discusses empirical findings emerging from the data analysis. As Section V concludes the study with recommendations for practice, Section VI suggests areas of future research based on limitations of the present study.

II. A Brief Tour Of The Literature

Igwe and Ude (2018) examined the planning and implementation of projects in the Nigeria's national and sub-national public sectors. The authors conducted a documentary review of official gazettes, reports and budgetary allocations to various projects in the ministries, departments and agencies of the government. Findings revealed that most public projects in Nigeria overrun the initial budgets, experience lags in execution and are poorly supervised. Igwe and Ude (2018) further revealed that the limited application of PMTT by public officers is the main reason for poor project execution in Nigeria. Most public offices in the country lack qualified project managers who are skilled to comply with project management manuals and apply PMTT in tracking the implementation process of projects (Igwe and Ude, 2018). By extension, Eja and Ramegowda (2020) considered the risk factors of public project failure in developing countries. Conclusions from the research hinted that inaccurate costing, corruption and communication lags characterize government projects in developing countries. This frustrates project milestones and breeds inefficiency in resource use. Eja and Ramegowda (2020)'s research is especially important in this study because it considers the dynamics of project management in Nigeria as special case.

In another perspective, Akinola et al. (2019) investigated the popularity of PMTT in the construction industry in Nigeria. Having administered questionnaire survey among 108 stakeholders in the construction industry, the researchers found that insufficient finance and changes in clients' requirements are factors discouraging the stakeholders from fully implementing the PMTT. According to Akinola et al. (2019), if a project is under-priced at its early stage with uncertainty on its profitability, the project managers may be demotivated to infuse PMTT in the project's execution. In consequence, the project is unduly delayed and poorly structured to prevent wastages. Similarly, Oboreh (2019) estimated binary logistic regression in order to discuss the prospects of project execution by construction companies in Delta State, Nigeria. Consistent with findings reported by Akinlola et al. (2019), Oboreh (2019) maintained that economic and political factors hinder the prospects of timely and efficient project execution in Nigeria. For economic factors, some companies fail to optimally deploy their human and financial resources to see the project through success. For political factors, the government of Nigeria is known to roll out random policies which may pressure the ease of sourcing inputs (Oboreh, 2019).

In addition, Unegbu et al. (2022) considered the relationship between project performance measures and project management practices in the Nigeria's construction sector. The authors obtained qualitative data from contractors, clients and suppliers with the aid of questionnaire instrument. A total of two hundred and fifty questionnaires were administered among the respondents, with the response rate of 88.4%. The data were analysed using the technique of structural equation modelling. Findings showed that stakeholder management is the most important driver of project success. This implies that implementation of PMTT responds to the existing stance or structure of the company on PMTT. Where the company's top management prescribes PMTT as regular practice in the company, other stakeholders adjust their behaviours to embrace PMTT in executing the projects.

Concerned with burgeoning infrastructure-linked debts of Nigeria, Diugwu et al. (2015) considered the low pace of infrastructural development in the country. Having compared the principles of project management with existing practices in executing projects on infrastructural advancement, Diugwu et al. (2015) found that a number of infrastructure projects in Nigeria are labelled with poor conception, faulty design and inefficient execution. The problem is exacerbated by poor monitoring and evaluation of projects by inexperienced project managers in the country. While noting the implications of this development, Diugwu et al. (2015) advocated that project consultants in Nigeria should leverage skilled project managers to optimize the adoption of PMTT in executing projects. More recently, Afieroho et al. (2023) posited that infusion of e-governance model such that

public infrastructure projects are delivered with technology-enhanced PMTT is a gateway to efficiently deploy public resources to bridge infrastructural deficits in Nigeria.

The poor outlook of project execution in Nigeria also extends to the private sector. In a recent inquiry, Oladiran et al. (2024) assessed the compliance of project management professionals in Nigeria to a variety of PMTT. It was revealed that majority of the professionals are unaware of commonly-used PMTT. A consequence of this is that project execution in Nigeria is characterized by communication lags where stakeholders are uncertain of their work descriptions and milestones are difficult to track. Oladiran et al. (2024) therefore called for popularization of PMTT among project management professionals in Nigeria. This will not only clear communication bottlenecks during project execution, but also maintain everyone's interests until the project succeeds (Oladiran et al., 2024). However, an exception to limited diffusion of PMTT in the Nigeria's private sector was noted in Modupe-Samuel (2022) who chronicled the best project management practices in the Nigeria's telecommunication sector. Modupe-Samuel (2022) collected primary data on project management practices among the sampled telecommunication companies relative to other practices in Nigeria and other countries. The conclusion pointed that the telecommunication companies are traditionally large with large financial resources to make them afford state-of-the-earth PMTT as they are available in practical domains.

Given the foregoing, researches on application of project management in general and PMTT are particular in Nigeria are concentrated around the public infrastructure and private construction projects. To the best of current researcher's knowledge, this study is the first to explore the adoption of PMTT among startups in Nigeria. Also, the focus of the literature is on the general project management practices – there is limited evidence on project management in the context of project execution in Nigeria. As a result, this study enriches the Nigeria-based literature with the evaluation of strategies which may influence the effectiveness of PMTT as they are adopted for project planning, design and execution.

III. Methodology

This study was descriptively designed towards exploring strategies of implementing PMTT at startup companies in Nigeria. To achieve this, a semi-structured questionnaire was administered among staff stakeholders of the startups. Being the hub of 80% of startups in Nigeria (Nigerian Economic Summit Group, 2023), Lagos was selected as the study area. In selecting the participating startups, purposive random sampling technique was used such that only startups with at least two years of operational experience were selected. Also, there was preference for startups in the fields of engineering and digital technology. Altogether, 10 startups were randomly sampled in Lagos which is the Nigeria's economic capital. From each startup, ten employees (senior and junior) were selected, making 100 respondents who voluntarily participated in this study. Each of the participants was presented with the questionnaire which is divided into three sections. Section A asks for brief demographic information of the participants. Section B gathers general information about the startup including the year of commencement of operation, field of practice, ownership structure, staff capacity and availability of project managers. Finally, Section C surveys the strategies being implemented by operating officers towards ensuring effective adoption and implementation of PMTT at the startup. Having collected these data, they were transferred into Excel spreadsheet for easy visibility. After this, the data were analysed using the SPSS software.

The participants' demographic information and descriptive data of the startups were analysed using frequency counts and percentages. However, data on strategies for implementing PMTT were analysed using logistic regression. In other words, the probability of each strategy to enhance effective implementation of PMTT was measured and interpreted. In particular, the logistic regression proceeded with the specification in equation 1.

$$Y = \beta X + e \dots \dots (1)$$

Where Y is the dependent variable which is binary measure of effectiveness of a PMTT strategy, being 1 if the strategy is perceived by participants as effective and 0 if otherwise. X is a vector of strategies which have literature evidence of being adopted while implementing PMTT. The existence of these strategies was measured using qualitative data on the questionnaire. β measures probabilities of the strategies to affect the effectiveness of PMTT. It is noted that e is stochastic error term which is distributed with zero mean and constant variance. These properties are important so that the regression estimates are not spurious. That is,

$$e \sim (0, \sigma) \dots \dots (2)$$

In non-compact form, equation 1 can be re-written as:

$$\begin{matrix} y_1 \\ y_2 \\ y_3 \end{matrix} = \begin{pmatrix} \beta_1 \\ \beta_2 \\ \beta_3 \end{pmatrix} \begin{pmatrix} x_1 \\ x_2 \\ x_3 \end{pmatrix} + \begin{matrix} e_1 \\ e_2 \\ e_3 \end{matrix} \dots \dots (3)$$

Where x_1 is structure-based strategy, x_2 is performance-based strategy and x_3 is industry-based strategy. More importantly, e is a catchall of other strategies of implementing PMTT which are not addressed in this study. This means that, being a qualitative study, findings in this study are reported with 5% level of significant. The null hypothesis is therefore stated as:

Ho: there exists no strategy to effectively implement PMTT among startups in Nigeria

IV. Empirical Results And Discussion Of Findings

The presentation of results of the empirical analysis begins with demographic characteristics of the respondents. Of the 100 participants, 56% are male while 44% are female. Majority of the respondents (66%) are married. All the respondents have university or polytechnic education with half of them having professional certificates in project management. The respondents also claimed competency in the use of computer packages which are helpful in implementing PMTT. The participants are predominantly Nigerians, with only 22% being nationals of other African countries including South Africa, Ghana, Liberia and Egypt.

Table 1: Descriptive characteristics of selected startups

Description of startup	Distribution	Frequency (%)
Field of operation of the company	Engineering	32
	Digital technology	68
Years of operational experience	0-1 year	0
	2-4 years	47
	5-7 years	53
	8+ years	0
Ownership structure	Sole owner	0
	Equities	100
Staff strength	1-19 workers	0
	20-39 workers	76
	40-59 workers	24
	60+ workers	0
Portfolios of workers	Senior management	20
	Project managers	24
	IT workers	40
	Interns	12
	Others	4
Intensity of PMTT implementation	High	100
	Medium	0
	Low	0
Form of strategy used for implementation of PMTT	Structure-based	25
	Performance-based	30
	Industry-based	20
	A mix of two or three	25

Source: Author’s Computation from Field Report, 2024

With respect to the sampled startups, 40% operate in the field of engineering while 60% are into digital technology (Table 1). The startups have been in business for at least 2 years but none has been established for more than 7 years. This suggests that the startups are all at the formative stage of their existence. This in part lends credibility to their status as startups which seek investors on their scalable businesses. In addition, none of the startups has sole ownership – all of them have a number of local and international investors who share part of the equities. The companies have staff strength of 20-59 workers with at least 2 project managers among the staff portfolios. Regarding the forms of PMTT being employed by the sampled companies, all of them agreed that they intensively use planning, design, and execution tools and techniques in their daily business operations.

The PMTT strategies surveyed among the startups are threefold: performance-based, structure-based, and industry-based. It is noted that 30% of the startups implemented performance-based strategy; 25% favoured structure-based strategy, 20% preferred industry-based strategy, and 25% mentioned that they adopted a mix of two or three of the strategies. Taking a closer look at the participants’ responses, it was ascertained that the startups that implemented PMTT based on staff performance and industry trends are those with 2-4 years of operational experience. However, the startups with preference for structure-based strategy have operational existence of 5-7 years. It follows that it takes about 5 years for the company to structurally internalize the use of PMTT in its planning, design and execution processes. In other words, the years of establishment matters in determining the form of strategy that a startup adopts.

To provide critical evaluation of the effectiveness of these strategy preferences, the participants’ responses were subjected to logistic analysis. On the research instrument, the respondents were asked of their perception of the effectiveness of each PMTT strategy. As presented in Table 2, their responses indicated that structure-based strategy has 27.83% probability of being effective; performance-based has 22.94% likelihood; and industry-based strategy has 20.55% chance. It follows that while majority of the respondents favoured the structure-based strategy as the most effective strategy to introduce and implement PMTT (Table 2), it takes fairly a long time (about 5 years) for the company to afford such strategy (Table 1). This is because it involves systematic procedure whereby all units of the company are conditioned to implement PMTT. This cuts across the planning,

design and execution processes of the company. However, given the elasticity of means, the effectiveness of PMTT responds highly to staff performance (1.35) relative to the company’s structure (0.86) or industry trend (0.31). By implication, even if PMTT is institutionalized in the firm’s operational structure, its adoption and implementation need be based on the degree of staff performance. In other words, workers’ competency and efficiency to use PMTT goes a long way in influencing the effectiveness of PMTT within the organization.

On the diagnostics, it is noted that the t-statistic of each of the PMTT strategies qualifies the coefficient estimate as significant. This implies that the null hypothesis (H_0) specified above is rejected. That is, there exist strategies which may determine the effectiveness of project management adoption at startup companies. As gathered in this study, these strategies may be based on the company’s structure, conditioned on staff performance or patterned along the industry trends. The computed standard errors are consistent with the asymptotic t-statistics. The F-stat (18.66) shows that the three strategies combined are significant determinants of PMTT effectiveness. The R^2 (0.78) interprets that the strategies account for about 78% in the variation of PMTT effectiveness – there may be other bespoke strategies which are not captured in this study. Finally, the log likelihood stat (-33.54) informs that the probability of the estimates occurring by chance is less than 1%.

Table 2: Effectiveness of PMTT strategies (logit estimates)

PMTT strategy	Coefficient estimate	Standard error	Asymptotic t-statistic	Elasticity of mean
Structure	0.2783	0.1376	8.7654*	0.8638
Performance	0.2294	0.0874	6.0035*	1.3456
Industry trends	0.2055	0.0761	5.7677*	0.3140

F-stat = 18.66;

Cox and Snell $R^2 = 0.78$

Log-likelihood stat = -33.54

* indicates that the coefficient estimate is significant at 5%

Source: Author’s Computation from Field Report, 2024

The argument that the company’s structure has the highest likelihood of shaping the outcome of PMTT adoption was previously put forward by Hermida et al. (2016) and Patricio et al. (2021). While application of project management principles requires initial skills and competencies of workers for its deployment, the rapid technological changes to the skills are only sustainable if there is clear institutional commitment to the PMTT (Hermida et al., 2016). This commitment is carried on the structure of the company. Relatedly, Patricio et al. (2021) stated that the governance structure of the company is an important factor influencing implementation of PMTT by the company’s staff. It is also noteworthy that the elastic response of PMTT execution to staff performance echoes the earlier submission of Nusari et al. (2018) and Al-Nabae and Sammani (2021). According to Nusari et al. (2018), the rating of workers (especially project managers) should include an element of their intensive use of PMTT to deliver their operational targets. Without performance-enhancing project management practices, the PMTT cannot be said to be effective. And this limits the stance of the company’s vision as fundamentally connected to the adoption and implementation of PMTT (Al-Nabae and Sammani, 2021).

V. Conclusive Summary And Recommendations

This study has established that adoption of PMTT is not unconditional among startups. Rather the implementation of project management practices is conditioned on the firm’s structure. This means that the sort of top-bottom arrangement that characterizes the firm determines the degree of embrace for project management among the firm’s employees. However, the effectiveness of PMTT adoption is more notably influenced by staff performance. That is, regardless of the structure in place, the competency and efficiency of workers in the use of PMTT is a primary driver of the contribution of project management to the firm’s growth and performance. Noting that it takes the firm an average of 5 years to fully adjust to the framework of project management, it can be concluded that the firm’s structure is the determinant of PMTT adoption in the long run while staff performance is the driving factor in the short run. Nonetheless, the availability of resources to aid the staff’s compliance with project management principles contributes to the initial stance of PMTT among the staff. For instance, where the workers lack the computer systems, internet connectivity, program subscriptions, or paid software, the infusion of project management in their work schedule may record limited success. This indicates the assertion that the firm’s financial commitment to project management communicates its stance on the implementation of PMTT for operations.

Given these findings, startups should focus on enhancing the staff capacity towards optimizing PMTT in the short run while the firm’s structure is aligned with the nomenclature of project management over the longer term. This follows the intuitive arguments that startups generally begin small with limited financial resources. As a result, the short-term attention of such small firms is to recruit workers with PMTT skills. This unlocks the pathway towards structuring the firm’s business along project management principles over the longer horizon.

Nevertheless, the gains of project management remain lofty with narrow success if the firm's staff capacity lacks project management portfolios. To circumvent the probable difficulty in diffusing PMTT within the firm's operation, the firm's initial recruitment should target full-fledged product managers with tractable history of proficiency and efficiency in using a variety of PMTT. Having achieved this, the evolving technology-enhanced PMTT should be updated within the firm's structure as more credence is accorded to PMTT as an approach to enhance the firm's performance.

VI. Limitations Of The Study

This study is limited on three grounds. First, the recruited startups are those in the fields of engineering and digital technology. This means that the implications of findings in this study cannot have straightforward extensions to other fields of business or operation where PMTT is implemented. Also, the outlook of large and established firms in the use of PMTT may not be directly deduced from the conclusions of this study. Rather, another streams of research may be necessary to characterize the dynamics of PMTT in such other fields or larger companies. Second, this study is limited by small data set – only 10 startups participated in the study. Further studies may therefore include larger data set involving different groups of startups in different fields of business. Finally, the data on effectiveness of PMTT are qualitative – experiences and opinions of the firms' employees were used to proxy the effective contribution of PMTT to firm's performance. Therefore, future research may concentrate on concrete quantitative data on PMTT strategy as provided by different firms.

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