ASSESSMENT OF PROJECT MANAGEMENT TOOLS ON BUILDING PROJECTS BY CONSTRUCTION PROFESSIONALS IN NIGER STATE AND FEDERAL CAPITAL TERRITORY, ABUJA

[1]MUSA, B. M., [2]KAGARA, A. B. & [2]IDRIS, A. M
[1]Department of Building Technology,
School of Environmental Studies
Niger State Polytechnic, Zungeru
&
[2]Department of Industrial and Technology Education,
School of Science and Technology Education,
Federal University of Technology, Minna

Abstract
The research was carried out using descriptive survey research design. The study was carried out in Niger State and Federal Capital Territory (FCT), Abuja. A purposive sampling technique was used to select 182 registered construction professionals as respondents for the study in construction industries in Niger State and Federal Capital Territory, Abuja. A 44-items structured questionnaire titled "Questionnaire on the Assessment of Project Management Tools on Building Projects by Construction Professionals (QAPMTBPCP)" was used for data collection. The instrument was validated by three experts in the Department of Industrial and Technology Education, School of Science and Technology Education, Federal University of Technology, Minna. The reliability of the instrument was tested using the Cronbach Alpha statistic and a coefficient of 0.84 was obtained. The data collected for the study was analyzed using mean and standard deviation for answering the research questions. While t-test statistics was used to test the hypotheses at 0.05 level of significance. The findings of the study revealed that construction professional are aware of the different types of project management tools adopted on the building projects and also the finding further revealed that the construction professional do not adopt some project management tools on the building projects. Based on the findings it was recommended that construction professionals should diverse a means of keeping abreast to the current trend in the management of building project with project management tools for effective delivery and construction industries should organize a workshop, seminar or conference in order to avails different types of project management tools for both old and young professional in the construction work.

Keywords: Assessment, Project Management Tools, Building Projects, Construction Professionals

Introduction

Project Management Tools (PMTs) are today gaining popularity and are highly discussed area in the construction industries. PMTs are techniques which generally help to effectively plan towards the successful completion of building projects (Ayodele & Alabi, 2015). However, projects within the construction industries are managed has not changed significantly during the last decade in Nigeria. Mattias (2012) explained that in the construction market, the number of different actors and the way the projects management are procured today has however changed in some developed countries.

The Project Management (PM) processes are common to most building projects and they include elements such as: project initiation, planning, execution, monitoring, controlling and the project closure (Project Management Institute (PMI), 2016). The PMI explained that PM is to ensure an efficient flow of project all through its life cycle. While project oriented processes involve the creation of PM process and specification. The processes are defined by the life cycle of the project and they differ by area of application and the stage of product life cycle (PMI, 2016). In these processes it is difficult to define a project scope without adequate knowledge of how to establish a specified product. For instance, in construction project, several tools and techniques are needed at each phase or to be taken into account when carrying out construction project (Olateju *et al.*, 2011). The PMI (2016) divided the process of project management into five group and these include the following: initiation, planning, execution, control/monitor and closing. Project managers employ these processes in their project, especially in large projects such as construction project where there are a lot of work packages such as purchasing, safety, subcontract, brick laying, roofing, forecasting scaffolding and equipment requirements (PMI,

2017). The phases in the projects overlap each other indicating that some stages in project life cycle are undertaken concurrently in the construction industries.

The construction industry is made up of professionals such as architect, builders, quantity surveyor, structural engineering, and others whose various disciplines are to ensure that construction work is completed as appropriate (Olateju, 2017). Architect is the person who directly communicates with the client and the first professional who is contacted by the client for the translation of his desire or need into drawings and specification. The architect overall responsibility is to design the construction project in accordance with the client's specification. The architect also performs the following roles; ensures the buildability of the design, responsible for the selection of contractors and subcontractors, responsible for contract administration, responsible for project coordination and coordination of other project team members by visiting the construction site on a regular basis as is necessary to determine the work is in progress (Olatunji, *et al.,* 2014).

Another construction professional is the Quantity Surveyor (QS). According to Obadan and Uga, (1996), The QS is professional trained, qualified and experienced personnel in dealing with problems relating to construction cost, management and communication in the construction industry. The QS is one of a number of professionals involved in the construction processes and has specific responsibility for project cost control not only through the construction phase but for the whole life of the building. Traditionally quantity Surveying is concerned with contracts and costs on construction projects and quantity surveyors control construction costs by accurate measurement of the work required. This role is achieved by performing the following activities: Conducting feasibility studies to estimate materials, time and labour costs, preparing, negotiating and analysing costs for tenders and contracts, coordination of work effort, advising on a range of legal and contractual issues, valuing completed work and arranging for payments. Also a builder is not left out as a major player in the construction industry.

A builder is an individual who engages in the planning, developing and coordinating of activities which coincide with the building of structures Olateju et al., (2014). Olateju explained that the general responsibilities of a builder as an individual is planning and carrying through any and all pertinent activities relating to the construction of a dwelling, building or other structure. The builder carries out his/her duties by: Supervising employees, planning how the project will be carried out and completing the project in a manner which coincides with all laws, rules and regulations which may be in existence and correlate with construction, implementing a plan in which to carry out the construction project. This extends anywhere from hiring workers to developing a step-by-step timeline that the project will follow from start to finish, the builder is responsible for hiring, supervising and, at times, firing employees who work on the specific project with the contractor.

Building construction project needs flexible management. Gould and Joyce (2009) observed that building construction projects can be very unpredictable and management needs to be able to cope with daily changes. Furthermore, the construction projects are instigated in a complex environment resulting in a situation of high risk and uncertainty, which are intensify by arduous time constraints (Grant & Pennypacker, 2006). Building construction project goes through the different phases and has therefore a continuously changing workflow and different cultural settings. Management needs to adapt to these changes and at the same time keep the home office updated with the progress of the project through the use of project tools.

In adoption of project management tools into the construction industry, construction project management must take into cognizant of methods, techniques, planning, co-ordination and control of a project from conception to completion (including commissioning) on behalf of a client requiring the identification of the client's objectives in terms of utility, function, quality, time and cost, and the establishment of relationships between resources, integrating, monitoring and controlling the contributors to the project and their output, and evaluating and selecting alternatives in pursuit of the client's satisfaction with the project outcome (Goedert & Meadati, 2008). In Nigeria today, there are constant news and reports of collapse of buildings and delay which when walk around urban areas shows a lot of abandoned building projects that have been marked by regulatory bodies to be demolished

because of the danger it pose. Therefore, there is a need to carry out an assessment of the adoption of project management tools.

Assessment as defined by Odu, (2011) as the process of gathering data and fashioning them into interpretable form for decision making. It often involves collection and collating of data obtained from an assessment process with a view to making valuable judgment concerning the situation or quality of an object or event. Assessment is not concerned with the explanation of the underlying reasons and does not proffer recommendations for action. Although, there may be some implied judgment as the adequacy or otherwise of the situation (Odu, 2011). Hence, the study is to assess the adoption of project management tools on building project delivery by construction professionals in Niger State and Federal Capital Territory, Abuja

Purpose of the Study

The purposes of the study are to:

1. Determine the construction professional awareness of the different types of project management tools adopted on the building projects in Niger State and Federal Capital Territory, Abuja
2. Find out whether the construction professional adopt the different types of project management tools on the building project in Niger State and Federal Capital Territory, Abuja

Research Questions

The following research questions were raised to guide the study:

1. Does the construction professional aware of the different types of project management tools adopted on the building projects in Niger State and Federal Capital Territory, Abuja?
2. Does the construction professional adopt the different types of project management tools on the building project in Niger State and Federal Capital Territory, Abuja?

Methodology

The research was carried out using descriptive survey research design. The study was carried out in Niger State and Federal Capital Territory (FCT), Abuja. Purposive sampling techniques will be used to select 182 registered construction professionals as respondents for the study in construction industries in Niger State and Federal Capital Territory, Abuja. A 44-items structured questionnaire titled "Questionnaire on the Assessment of Project Management Tools on Building Projects by Construction Professionals (QAPMTBPCP)" was used for data collection. The questionnaire items were assigned five points rating scale of Very Aware (VA) / Highly Adopted (HA) with 5 points, Aware (A) / Adopted (A) with 4 points, Unaware (U) / Moderately Adopted (MA) with 3 points, Very Unaware (VU) / Not Adopted (NA) with 2 point and Undecided with 1 point. The instrument was validated by three experts in the Department of Industrial and Technology Education, School of Science and Technology Education, Federal University of Technology, Minna. The reliability of the instrument was tested using the Cronbach Alpha statistic and a coefficient of 0.84 was obtained. The data collected for the study was analyzed using mean and standard deviation for answering the research questions. While t-test statistics was used to test the hypotheses at 0.05 level of significance. Real Upper and lower limit of numbers was used in order to determine the decision of the respondents to each items. Also, p-value is greater than alpha value at 0.05 level of significance, the hypotheses was accepted and if otherwise rejected.

Results

Research Question One

Does the construction professional aware of the different types of project management tools adopted on the building projects in Niger State and Federal Capital Territory, Abuja?

Data for answering research questions one is presented in Table 1.

Table 1: Mean and Standard Deviation of Construction Professional Aware of the Different Types of Project Management Tools Adopted on the Building Projects in Niger State and Federal Capital Territory, Abuja

S/NO.	Awareness of different types of Project Management Tools	X	SD	RMK
1	Critical Path Method	4.12	0.45	Aware
2	Gantt Chart	3.45	0.52	Aware
3	Project Network Diagrams	3.22	0.81	Aware
4	Work Breakdown Structure (WBS)	3.76	0.28	Aware
5	Benchmark Job Technique	2.44	0.55	Unaware
6	Earned Value Management	3.15	0.35	Aware
7	Modular Approach	2.14	0.92	Unaware
8	Expert Judgment	2.55	0.65	Unaware
9	Parametric Techniques	3.45	0.46	Aware
10	Project Stakeholder Management	3.56	0.76	Aware
11	Linked Bar Chart	4.28	0.84	Aware
12	Project Risk Management	3.28	0.27	Aware
13	Line of Balance	2.53	0.62	Unaware
14	Business Care	2.89	0.39	Aware
15	Cost of Quality	3.76	0.77	Aware
16	Agile Tools	3.77	0.28	Aware
17	Flow- charting	3.91	0.74	Aware
18	Decomposition	2.33	0.88	Unaware
19	Use of Spreadsheets e.g. Excel	3.25	0.19	Aware
20	Use of Simulation/ Statistical Tools	3.54	0.57	Aware
21	Benefit/ Cost	3.12	0.53	Aware
22	Benchmarking	2.19	0.61	Unaware
	Grand Mean	**3.21**	**0.56**	**Aware**

Table 1 revealed the mean responses of construction professional awareness on the different types of project management tools adopted on the building projects in Niger State and Federal Capital Territory, Abuja with majority of the item agreed to be aware ranging from 3.12 – 4.28, while some few of the items were unaware. However, the grand mean of 3.21 implies that the respondents jointly agreed with almost all the items. The standard deviation of the items ranges from 0.27-0.92 which further indicates that the respondents were not too far from the mean and were closed to one another in their responses. This closeness of the respondents adds value to the reliability of the mean. Hence the construction professional are aware of the different types of project management tools adopted on the building projects.

Research Question Two

Does the construction professional adopt the different types of project management tools on the building project in Niger State and Federal Capital Territory, Abuja?

Data for answering research questions one is presented in Table 2.

Table 2: Mean and Standard Deviation of construction professional adopt the different types of project management tools on the building project in Niger State and Federal Capital Territory, Abuja

S/NO.	Adoption of different types of Project Management Tools	X	SD	RMK
1	Critical Path Method	2.88	0.46	Moderately Adopted
2	Gantt Chart	3.51	0.38	Adopted
3	Project Network Diagrams	3.22	0.29	Adopted

4	Work Breakdown Structure (WBS)	2.33	0.44	Not Adopted
5	Benchmark Job Technique	2.45	0.36	Not Adopted
6	Earned Value Management	2.38	0.29	Not Adopted
7	Modular Approach	2.86	0.77	Moderately Adopted
8	Expert Judgment	2.11	0.83	Not Adopted
9	Parametric Techniques	2.44	0.47	Not Adopted
10	Project Stakeholder Management	3.66	0.24	Adopted
11	Linked Bar Chart	3.19	0.39	Adopted
12	Project Risk Management	2.13	0.22	Not Adopted
13	Line of Balance	2.48	0.31	Not Adopted
14	Business Care	2.17	0.63	Not Adopted
15	Cost of Quality	2.66	0.82	Moderately Adopted
16	Agile Tools	2.09	0.49	Not Adopted
17	Flow- charting	3.67	0.38	Adopted
18	Decomposition	2.14	0.64	Not Adopted
19	Use of Spreadsheets e.g. Excel	3.66	0.55	Adopted
20	Use of Simulation/ Statistical Tools	2.17	0.92	Not Adopted
21	Benefit/ Cost	2.91	0.84	Moderately Adopted
22	Benchmarking	2.25	0.73	Not Adopted
	Grand Mean	**2.69**	**0.52**	**Not Adopted**

Table 2 revealed the mean responses of construction professional adoption of the different types of project management tools on the building project in Niger State and Federal Capital Territory, Abuja with majority of the item not adopted ranging from 2.09 – 2.48, while some few of the items were adopted. However, the grand mean of 2. 69 implies that the respondents jointly agreed with maj ority not been adopted. The standard deviation of the items ranges from 0.22-0.92 which further indicates that the respondents were not too far from the mean and were closed to one another in their responses. This closeness of the respondents adds value to the reliability of the mean. Hence the construction professional do not adopt the different types of project management tools on the building projects.

Finding of the Study

1. The construction professional are aware of the different types of project management tools adopted on the building projects.
2. The construction professional do not adopt the different types of project management tools on the building projects.

Discussion of Findings

The finding revealed that construction professionals are aware of the different types of project management tools adopted on the building projects. In support of the this finding Okoye *et al.*, (2016) that pointed out that lack of awareness has hindered most of the construction companies from adopting a management tool as they do not have prior knowledge of its outcome. This statement buttresses Ofori-Kuragu *et al.*, (2016) who affirmed that the creation of awareness is significant to the adoption of PMT; they also stated that if people are completely aware of the advantage derived from PMT implementation, there is the possibility that they will take full part in adoption of PMT. A comment from the case study asserts that, the technological infrastructure aspect of this organisation persists as the key challenge hindering PMT implementation as well as the related issues, including awareness. This is in collaboration with Ofori-Kuragu *et al.* (2016) opinion that the creation of awareness is one of the key factors for improving PMTT in construction organisations.

The findings also revealed that the construction professional do not adopt the different types of project management tools on the building projects. In agreement with the findings is Chaves, *et al.* (2016) assert that the use of PMT in construction companies in Nigeria is less effective; this is attributed to economic factors that hinder adoption. Also in support of the finding Baptista, *et al.*, (2016) that funding project, foreign investment and foreign exchange rates influence the successful adoption of PMT in various ways. This could be associated with changes in regulation requiring changes in the adoption of new

approaches to business and competition between construction companies. In addition, Nunan, *et al.*, (2015) assert that economic factors are contributing factors to the performance of an economy, and that directly influences a construction company and has extensive effects on the adoption of PMT. For instance, an increase in the inflation rate of an economy would definitely influence the way construction companies adopt new business approaches. Like other factors, this factor is presented in the framework as one of the key factors influencing the adoption of PMT. This factor includes: cost of investment, lack of funds, poverty rate and unstable economy.

Conclusion

Based on the findings of the study it was concluded that the construction professional are aware of the different types of project management tools adopted on the building projects but very few among them are adopted. It was also concluded that the construction professional do not adopt the different types of project management tools on the building projects due to political and economic factors which hinder adoption for successful building project delivery in construction industries in Niger State and Federal Capital Territory, Abuja

Recommendation

Based on the findings of the study it was recommended that;

1. Construction professionals should diverse a means of keeping abreast to the current trend in the management of building project with project management tools for effective delivery
2. Construction industries should organize a workshop, seminar or conference in order to avails different types of project management tools for both old and young professional in the construction work
3. Government should also assist the construction professional by making it mandatory and also encouraging any practicing construction professional to adopt the use of project management tools compare to conventional management due to the trend in the construction field.

References

Ayodele, E. O & Alabi, O. M. (2015). Abandonment of construction project in Nigeria: causes and effects. *Journal of Engineering Trends in Economics and Management Sciences* 2(2); 142-145.

Baptista, A., Santos, F., Páscoa, J. & Sändig, N. (2016). Project Management Methodologies as Main Tool for Current Challenges in Global Economy Driving Historical Changes. *Journal of Advanced Management Science*, 4 (2), 3-12

Chaves, M. S., Araújo, C. D., Teixeira, L., Rosa, D., Júnior, I. & Nogueira, C. (2016). A new approach to managing Lessons Learned in PMBoK process groups: The Ballistic 2.0 Model', *International Journal of Information Systems and Project Management*, 4 (1), 27-45.

Goedert, J., & Meadati, P. (2008). Integrating Construction Process Documentation into Building Information Modeling. *Journal of Construction Engineeringand Management,* 134(7), 509–16.

Gould, F.E, & Joyce, N.E, (2009). *Construction project management*. Upper Saddle River: Prentice Hall

Grant, K. P., & Pennypacker, J. S. (2006). Project management maturity: an assessment of project management capabilities among and between selected industries. IEEE Transactions on Engineering Management, 53(1), 59-68.

Nunan, F., Hara, M. & Onyango, P. (2015). 'Institutions and co-management in East African Inland and Malawi Fisheries: A critical perspective', World Development, 70 pp.203214.

Mattias, Y. J. (2012).Agile project management in the construction industry - An inquiry of the opportunities in construction projects. Unpublished Master Thesis. University of Stockholm

Obadan M. I, & Uga E. O (1996). National planning and construction in Nigeria. 17th biennial Conference of the Nigerian Institute of Quantity Surveyors, 8-13.

Odu, K. O (2011). Human Capital Development in Science and Technology education: Challenges and New Responsibilities the Teacher. Contemporary Educational Technology 2(3): 238-249

Ofori-Kuragu, J. K., Baiden, B. K. & Badu, E. (2016) 'Key Performance Indicators for Project Success in Ghanaian Contractors', *International Journal of Construction Engineering and Management*, 5 (1), 1-10

Olateju, O. I., Abdul-Azeez, I. A. & Alamutu, S. A. (2011) 'Project management practice in Nigerian public sector–an empirical study', *Australian Journal of Business and Management Research*, 1 (8), 01-07.

Olateju, I., (2017). Effects of The Application of Project Management Techniques On Health Care Project Success. A Study of Badagry General Hospital, Lagos State. *Economic and Environmental Studies*, 17 (44), .725-741.

Olatunji, S. O., Akinola, J. A.,Oke, A. E. & Osakuade, A. O. (2014). Construction professionals team roles and their performance. *International Journal of Advanced Technology in Engineering and Science* (ISSN 23487550), Volume 02, Issue 08, 308-316

Olatunji, S. O., Akinola, J. A.,Oke, A. E. & Osakuade, A. O. (2014). Construction professionals team roles and their performance. *International Journal of Advanced Technology in Engineering and Science* (ISSN 23487550), Volume 02, Issue 08, 308-316

Okoye, P. U., Ogunoh, P. E. & Mbakwe, C. C. (2016) 'Comparative Analysis of Pre and Post Re-basing Economic Performance of Nigeria Construction Sector for Economic Development', *Universal Journal of Computational Mathematics*, 3 (1), 12-23

Project Management Institute (2016). Guide to the project management body of knowledge, PMBOK Guide 2000 edition' Newton Square, PA: Project Management Institute.

Project Management Institute (2017). Guide to the project management body of knowledge, PMBOK Guide 2000 edition' Newton Square, PA: Project Management Institute.