

Analysis of Time and Cost Performance of Construction Projects in Rivers State, Nigeria

Ibeawuchi I. Echeme, PhD and Uchenna U. Moneke, PhD

*Department of Project Management Technology
Federal University of Technology, Owerri, Nigeria*

Abstract

Time and cost performances have been and are still the main criteria for judging project success. So their management is critical to avoid overrun of any sort which may result to project failure. This study focused on the analysis of time and cost performance of projects in Rivers state, Nigeria with the aim of determining the level of variations, if any that occurred during the implementation of such projects. Earned Value Analysis (EVA) model was used to analyze the performance data of thirty nine selected projects with respect to their cost and time criteria which show low performance due to high level of cost and time variations witnessed. The study also revealed that most of the projects ended up incurring extra cost than budgeted. Eleven (11) projects out of the thirty nine (39) selected projects met the cost consideration. All the selected projects except four (4) were delayed resulting in time overrun. Based on the findings, the study recommends among others the periodic monitoring of construction project cost and time as a technique to identify and correct any variation before it distorts the project plan.

Keywords: construction projects, earned value analysis model, project implementation, project performance, time and cost variations.

Introduction

Construction of projects is complex undertaken in Nigerian, especially in Rivers state. This is because of certain environmental variables which this study has chosen to identify for corrective purposes. Studies have revealed multiple benefits derived from successfully executed construction projects. Project is therefore seen as a proposal for an investment to increase, expand and/or develop certain facilities in order to increase the production of goods and/ or services in a community during a given period of time.

Again for evaluative purposes, a project is a unit of investment, which can be distinguished technically, commercially and economically from other investments. Akpan (2013) explained the term project to connote any unique activity, situation, task, programme, scheme, or any human endeavour in which human, time and other resources are utilized to satisfy a definable and definite one-off (single or multiple) objective, the realization of the set objective generally signals the completion of this unique activity. Furthermore, it was added that the word "completion" as used may not be implicit and could be discriminatory as it can come out to be unsatisfactory completion depending on the set criteria. An unsatisfactory completion connotes that though the

project was realized, its realization did not adhere to the set criteria of cost, schedule and quality.

Project development is an integrated process which can be carried out in different and sequential stages such as project preparation, evaluation, selection, execution, etc. With the considered stages of operation, the task of project management in relation to its cost and time management in the specific areas of execution arise. Special focus is centered on how to achieve successful project implementation in Rivers State, and other states in Nigeria.

Since the existence of projects are for development purposes, the assessment of time and cost performances of these projects become very necessary for developing nations, like Nigeria. This laudable arrangement for analyzing time and cost performances in project execution in Rivers State, Nigeria will aid investors and project experts to effectively plan and manage cost and time. This will assist in minimizing cost and time overrun and risks inherent in project management and thereby maximizing values, performances, profits and owners satisfaction as the case may be (Echeme, 2015). The benefits derivable from a successful project management, especially in the area of execution have renowned multiplier effects on the economies of our various societies.

However, dynamic nature of the society and the continuous dwindling of the economy have given rise to a lot of negative feelings to the project experts, their clients and project development agencies in most developing countries regarding whether project success is achievable under an unstable economy. These days many projects are abandoned, those completed were not realized within their planned budget and schedules. Sequel to this, primary investigations have indicated that costs of establishing projects are on the high side to the detriment of investors and all other beneficiaries.

Again, a critical view of the complex nature of the phases of project management with special reference to the project executions have revealed that the construction industries of in Nigeria and other developing countries are really in a mess when compared with their counterparts in developed nations of the world.

The rationale for this study therefore is based on the fact that construction projects are being implemented in Rivers state, Nigeria and other states of the nation and a lot of funds are invested in the planning and implementation of these projects in order to improve the developmental efforts of the Government. Despite these investments, the developmental aim seems to be defeated owing to the fact that the citizens are yet to benefit from the impact of these projects. It is believed that most of these projects ended up experiencing time and or cost variations with some being abandoned and some experiencing total failure.

It has been universally agreed that the major parameter for describing an area as developed or undeveloped is based on the availability of social infrastructure. When such basic infrastructure are lacking in an area, it is obvious that such a place is underdeveloped. It is in the bid to provide such basic amenities that the government at various levels strive to improve the livelihood of the people through the provision of such

basic infrastructures in form of projects. Despite all the efforts, the implementation level of constructions projects is still low in Nigeria, and specifically, in Rivers state and has not impacted positively on the lives of the people (Echeme & Nwachukwu, 2009).

To streamline the study, specific views are on the analysis of cost and time performance of construction projects in Rivers state. This is aimed at determining the level of cost and time variations, if any, in the implementation of construction projects for decisive purposes. Attempts were also made to determine how to achieve better executions for public building projects in Rivers state, Nigeria. Efforts were directed towards finding lasting solutions.

To achieve these objectives, the following research questions were developed;

- (a) What is the level of variations in the implementation of construction projects in Rivers state, Nigeria?
- (b) How could these variations be handled to minimize the incidence of project failure and improve the level of successful construction project implementation in Rivers state?

Related Literatures

The issue of project time and cost variations has been a thorn in the flesh of the actors in the construction industry over the years. Recent awareness has forced people to keep on searching for improved ways of ameliorating the problem of project time and cost overrun. Observations about this ugly situation have been very much glaring in construction project execution. The stated problem of this study has been threatening the socio-economic development of most states in Nigeria, especially, Rivers state. The circulating problem of cost and time variation in projects has been attributed to the activities of various levels of government and people who award shoddy contracts.

Public Projects

We have private and public projects, but for the purpose of this study, emphasis is more on public projects. Various levels of government, their agencies, and international organizations fund and implement rural development /public projects like; road networks, irrigation projects, markets, schools and community health buildings or rehabilitation, power supply etc. (Nwachukwu, Echeme & Okoli, 2010). The government play dominant role in the economy and there are more public projects failure in Nigeria than in other developing economies. The bloated size and inefficiency of the public project sectors no doubt contributed substantially to the economic crisis currently bedeviling the nation.

Lamenting on the inefficiencies of the public sector, Salam (2005) complains that public or development projects suffer from procrastinations, poor conceptualization, planning and implementation. The scathing commentary, aptly describes the track records of most key public projects, parastatals, and donor agencies in the country.

Essien (2007) also observes that succeeding government at the local, state and federal levels are not in the habit of completing projects initiated and commenced by their predecessors. They always prefer to award fresh contracts. What are the reasons? Further research may provide some answers.

Meanwhile, Nicholas (2008) explained that many efforts at saving human life and recovering from man-made or natural disasters become projects. Examples are the massive cleanup following the Soviet nuclear accident at Chernobyl, Russia; and the rescue and salvage operations following disasters earthquakes in Mexico City; Turkey; Armenia; and Kobe, Japan. Likewise, it is worthy to note that the efforts made by the various levels of Government, NGOs, International donor agencies, etc. to better the living conditions of the Nigeria citizens are all projects.

Successful projects must result in positive change such as an improvement in the wellbeing of the households, the community, the nation, and the world. Okongwu (2014), points out that project is cardinal to the growth and development of the national economy. Projects (Public or Private) can be conceived as the building blocks of the national economy. To fortify the structure of the nation, it becomes imperative to plan and implement additional projects, drawing from the nation's human and non-human resources. These projects, when successfully completed, add to the wealth of the nation and become an index of the level of economic development. The central theme of all these definitions is that each project is unique on its own in that it consists of a series of activities, consumes time, has a budget and must meet certain expectations of the owners at the right time and cost. We are however inclined not to look at this definition from the textbook angle but from the practical reality. To do this, we need to ask ourselves again, why projects? It is true that projects come into being because of the scarcity in supply of goods and services. If there is no scarcity, the concept of project would not arise. It therefore follows that projects are not ends unto themselves but means to an end. If we accept this view, we then define a project as a structure or platform from where goods and services could be produced and supplied to the needy (Okorafor, 2014). Project execution is therefore the creation of the platform or structure on which production of goods and services can be carried out. Kezner (2004) added that a successful project execution occurs if the project, comes on-time, on-budget, achieves all the goals originally set for it, and is adopted and used by the clients for whom the project is intended.

Project Time and Cost Control

The issue of time and cost overruns during the project execution is like that of twin sisters. At different situations, each can lead to the other as the case may be. In most cases, time overrun leads to cost overrun and this is the major reason why the new breed project managers are becoming more careful in their planning and executions of all kinds of projects. At any rate, time overrun is undesirable and a good project time is not to be extended. Good enough, time and cost control during project execution has been formalized and standardized through the use of Critical Path Methodology and other related techniques.

Immediately the overall schedule is in place and job execution takes off, periodical review of the project network becomes necessary to check progress against schedule. The required control should be directed towards critical or near critical activities. It has been emphasized several times by project management authorities like Meredith (2005) and Akpan and Chizea (2007) that the frequency of time and cost recording may depend on the number of activities. For a project with large number of activities, daily reporting may be necessary but on other projects with fewer activities, weekly or fortnightly reporting may be adequate. It was also revealed that the continuing exercise of monitoring the project time and cost variable might yield a means of foreseeing some possible future trouble in sufficient time for corrective measures to be adopted.

Cost Behaviour during Project Implementation

An adequate knowledge of the way and manner the cost element behaves is very crucial in project execution. Recall that in terms of reference to cost behaviour, the essence is to show the reactions of various cost elements to the changes on volume of business activities. Coulthrust *et al* (1990) gave the cost components as fixed, variable and mixed. Mixed cost contains certain elements of both fixed and variable costs. Fixed costs are those that do not vary with the level of production. These costs remain constant at least in total but may become progressively smaller on a per unit basis as the volume of production increases. The monthly or annual rent paid for hiring a concrete mixer for instance, is a fixed cost. The knowledge of the fixed cost element is of a particular importance in evaluating cost overrun since it is obvious that this must continue to accumulate whether or not production takes place. If there is project implementation delay, surely the project cost is bound to increase due to accumulation of fixed costs unless the contractor takes a decisive action to shed these costs immediately.

Variable costs are those costs, which vary directly with the volume of activities. They are fixed in units but vary in total. Examples of variable costs are direct materials, direct labour and direct expenses.

Cost Elements and Their Related Theories

In project management, right from inception to completion stage, one is estimating cost. The reason is that for private sector, we minimize input and maximize output. But for public sector, we maximize value and minimize cost. From the producer's point of view, cost and price are interrelated. It cost money to acquire money. Cost is the sum of various demands of resources, skills, risks etc. which an organization must meet before it can offer its product/service/project to the public for sale. The seller's price is the buyer's cost(s). Estimating is the process by which cost computations are carried out at the various stages of the project cycle (Nwachukwu & Echeme, 2016). It is also a technical process of arriving at an estimate of constructing project costs/building costs. It is important at this juncture to understand the term cost in general and construction cost in particular. The cost of anything to a customer is what he is willing to sacrifice in cash, credit, effort, inconvenience, etc. to get it. The cost to a seller is the amount he is prepared to risk in similar terms in order to trade. The cost to a marketer is the sum of

the various demands on resources, skill, risk that must be made before he can offer his product for sale (Ayeni, 2006).

Cost therefore has an objective element, which is interpreted in the context of series of subjective judgment about risks, returns and values. It is not single value function of materials, labour, plants and overhead. If it were the process of cost accounting, estimating and designing would be of a lesser problem (Coke and Jepson, 2009).

According to Ferry (2002), cost of the building will mean the amount the owner will have to pay to contractor to build it for him. We do not mean the actual cost of contractor for building it, but the knowledge of the actual cost of that building is not irrelevant to the builder's client and his consultants even if it is not their business, since this contractor's cost to the builder's client and his consultants even if it is not their business, since this contractor's cost to his client directly and indirectly is the price (costs) that the client has to pay for a given contract (project).

It must be noted that the seller's price is the buyer's cost, therefore cost and price are closely related. Saunt (2010), on his part defined cost in respect of building works as the amount paid by the client for either completed building or for specific section. Production cost/contractor cost which the clients and his consultants are always trying to predict or forecast could be categorized as follows: unit rate – cost of labour, cost of materials, cost of plant, cost of overhead/establishment charges and cost of profits.

Contributions of the Cost Experts in Cost Reduction and Cost Control

The cost experts like the quantity surveyors, accountants, purchasing officers, etc have contributed immensely in the areas of cost reduction control. They have their regards in businesses due to their formalized approaches and techniques, which they adopt in the duties they perform. Certain activities can be used to reduce costs: value analysis and value engineering, components and materials, standardization, improvement in buying practices, production engineering and methods and layout improvement, scrap reduction, manpower planning, system analysis and simplification. These activities according to Ayeni (2006) have their meanings in forms like: Component and Material Standardization, Improvement in Buying Practices, Scrap and theft Reduction and Control.

The Role of Project Managers in Minimizing Cost and Time Overruns

It has been observed that most projects experience cost overruns as a result of lack of experienced project planners in the said locations. This is so because of the fact that people are yet to realize the need to engage project managers who are skilled in both planning and execution. The rudimental functions of the project manager are viewed to be the following:

- i. **Project legitimization:** To ensure that the project is acceptable to the top management and that it is in keeping with the laws of the land and consistent with the objectives of the company.

- ii. Obtaining resources: To identify the sources of the necessary resources needed for the project.

Overall planning and co-ordination: since he is the key spokesman for the total project and relates to policy making bodies, resource control groups, key administrators of functional organizational units, the top executive structure of his organization, principal suppliers, scientific groups and clients or user organization. Hence a project manager contributes in minimizing cost overruns through: Proper cost analysis of projects, preparation of standard feasibility study, proper projects execution, etc. (Alaukwu, 2008).

Materials and Methods

Sources of Data

Two main sources of data are used for this research: the primary and secondary sources. To generate the required data for this study, the researcher recognized the following secondary sources: Contractors; River State Housing Corporations; Federal, State and Local Government Works Units (Ministries); Works and Physical Planning Unit of University of Port Harcourt; Universal Basic Education Board; Public and Private Libraries; Internet project related sources; journals; research reports, etc. To extract the data on the effects of the identified constraining factors from personnel directly involved in the implementation of the projects, data came from questionnaires as the primary source.

Research Design

The method of research design adopted is the survey as well as case study technique designed to be exploratory. This method is aimed at obtaining a better understanding of the projects with respect to time and cost performances of the construction projects in Rivers state, Nigeria through the evaluation of their past performances. Also it enabled the study to answer the research questions correctly. The objective therefore, is to make better suggestions on the best way to improve future performances based on the analysis.

Study Population and Sample Procedure

Thirty nine (39) government sponsored education projects undertaken by both federal and state government were chosen purposefully based on the available data during the investigation. Hence, the performance data analysis focused on the activities of these thirty nine (39) construction projects in Rivers state, Nigeria.

Tools for Data Analysis

The study used earned value analysis (EVA) model to analyze the collected data from the secondary source.

Earned Value Analysis (EVA) Model

The performance data collected from some selected construction projects in Rivers state were analyzed using Earned Value Analysis (EVA). This is to determine the level of variations that occurred in some selected construction project implementation as it relates to cost and time specifications, since they are the main criteria for judging the success of projects. EVA compares planned amount of work with what has actually completed, to determine if the cost, schedule and work accomplished are progressing in accordance with the plan. Mathematically,

$$\text{Schedule Variance (SV)} = \{BCWP - BCWS / BCWP * 100\} \dots \dots \dots (1)$$

$$\text{Cost Variance (CV)} = \{BCWP - ACWP / BCWP * 100\} \dots \dots \dots (2),$$

where; **BCWS** is budgeted cost of work scheduled or planned budget, **BCWP** is budgeted cost of work in place, i.e. earned value at the time of evaluation, **ACWP** is actual cost of work in place.

A zero cost variance and a negative schedule variance would indicate that project cost is currently on budget, and on course but probably resources are not being applied to the project appropriately. That also is an indication of possible delay. Basically, a positive variance is desirable (under budget and ahead of schedule) and a negative percentage is undesirable (over budget and behind schedule).

Results and Discussions

Analysis of the Performance Data of Some Education Projects in Rivers State

The tables (1 and 2) below evaluated some selected education projects embarked upon by both the Federal and state governments in Rivers state, Nigeria based on their cost and schedule variances to see whether they were completed within cost and schedule requirements. This was done using the Earned Value Analysis (EVA) model to determine the level of variations that occurred (if any) and the reasons behind them.

Table 1 Rivers State Projects Executed in Some Primary and Secondary Schools

S/N o.	Project Title and benefiting School	L.G.A	Initial contract sum	Final contract sum	Contract sum variation	% of variation	Initial completion time	Final completion time	Period variation (weeks)
1	Const. of 5 block of class room project at Town School, Oyigbo	Oyigbo	5,270,165.64	5,270,165.64	0	0%	16-05-2012	01-11-2012	26
2	Const. of 5 block of class room project at S.S Akpajo	Eleme	5,270,165.64	5865449.64	594,284.00	11.3%	16-06-2012	08-10-2012	17
3	Const. of 5 block of class room project at UPE P/S	Ahoda	5,270,165.64	586500.23	594,841.59	11.3%	08-06-2012	24-10-2012	12

	Odiopiti									
4	Const. of 5 block of class room project at O.T.S Obibi	Etche	5,270,165.64	5505931.48	235,765.84	4.5%	17-05-2012	15-10-2012	20	
5	Const. of 5 block of class room project at .M.S., Obuama	Degema	5,270,165.64	5,270,165.64	0	0%	30-10-2012	30-10-2012	0	
6	Const. of 5 block of class room project at S.S., Churchill, PH	P/Harcourt	5,270,165.64	5,270,165.64	310,000.00	5.9%	16-05-2012	17-10-2012	20	
7	Const. of 5 block of class room project at C.P.S. kono-Boue	Khana	5,270,165.64	6075363.92	805,198.28	15.3%	31-05-2012	12-11-2012	22	
8	Const. of 5 block of class room project at S.S., Ozuoba	Obio/Akpor	5,270,165.64	5434882.54	164,714.90	3.1%	16-15-2012	22-11-2012	22	
9	Const. of 5 block of class room project at S.S., Wakama	Ogu/Boldo	5,270,165.64	5338047.39	67,881.75	1.3%	10-05-2012	10-10-2012	20	
10	Const. of 5 block of class room project at S.S., Soku	Akuku-Toru	5,270,165.64	5744690.64	4744,525.00	9%	06-08-2012	26-04-2013	27	
11	Const. of 5 block of class room project at State School Edeoha	Ahoada East	5,270,165.64	5452636.32	182,470.68	3.5%	17-05-2012	23-07-2013	9	
12	Const. of 5 block of class room project at S.S., Ogbogoro	Obio/Akpor	5,270,165.64	5665102.04	394.936.40	7.5%	14-06-2012	20-05-2012	4	
13	Const. of 5 block of class room project at C.P.S. Omagwa	Ikwere	5,270,165.64	5508359.39	283,193.75	4.5%	16-05-2012	13-06-2012	4	
14	Const. of 5 block of class room project at C.P.S. Unyeada	Andoni	5,270,165.64	14148982.64	8,878,817.00	168.5%	12-06-2012	13-06-2012	1 day	
15	Const. of 5 block of class room project at M.P.S Primary School, Wuoma Nkoro.	Opobo Nkoro	5,270,165.64	5,270,165.64	0	0	21-06-2011	31-07-2013	99	
16	Construction of 1 Storey School Block and 8 room VIP Toilet Facility at S.S. Il.Ngo	Andoni	7,270,165.64	7558513.22	288,347.59	5.5 %	25-09-2012	01-02-13	17	
17	Construction of 1 Storey School Block and 8 room VIP Toilet Facility at M.P.S . Chek Moluk	Andoni	7,270,165.64	7730527.25	460,361.61	8.7 %	30-10-2012	11-04-2013	22	
18	Construction of 1 Storey School Block and 8 room	Obio/Akpor	7,270,165.64	7270165.64	0	0	25-09-2012	17-05-2013	31	

	VIP Toilet Facility at S.S. Koroma-tai								
19	Construction of 1 Storey School Block and 8 room VIP Toilet Facility at UPE Model PS Borokiri PH	P/Harcourt	7,270,165.64	7531525.64	261,360.00	5 %	19-12-2011	03-06-2013	68
20	Construction of 1 Storey School Block and 8 room VIP Toilet Facility at CPS, Ndashi	Etche	7,270,165.64	7,270,165.64	0	0%	24-10-2011	26-03-2013	65
21	Construction of 1 Storey School Block and 8 room VIP Toilet Facility at UBE, Ofeh	Onuma	7,270,165.64	7,270,165.64	0	0%	09-11-2011	13-03-2013	62
22	Construction of 1 Storey School Block and 8 room VIP Toilet Facility at Oyigbo, Pry. School	Pyigbo	7,270,165.64	7390650.56	120,484.92	2.3 %	19-12-2011	03-06-2013	70
23	Construction of 1 Storey School Block and 8 room VIP Toilet Facility at S.S. Degema	Degema	7,270,165.64	7754925.84	484,760.20	9.2 %	26-02-2012	19-11-2012	43
24	Construction of 1 Storey School Block and 8 room VIP Toilet Facility at P.S. Kpite (New Site Ps IV Bunu)	Tai	7,270,165.64	8360164.64	1,090,000	20.7 %	26-03-2012	28-03-2013	48
25	Construction of 1 Storey School Block and 8 room VIP Toilet Facility at BCM Primary Abonnema	Akuku-Toru	7,270,165.64	7,270,165.64	0	0	19-02-2013	30-07-2013	22
26	Construction of 1 Storey School Block and 8 room VIP Toilet Facility at Churchill I PA	Port-Harcourt	7,270,165.64	7748527.25	478,361.61	9.1 %	12-12-2011	18-07-2012	26
27	Construction of 1 Storey School Block and 8 room VIP Toilet Facility at CPS Deken	Gokhana	7,270,165.64	8291165.64	1,021,000	19.4 %	29-07-2012	30-07-2013	48
28	Construction of 1 Storey School Block and 8 room VIP Toilet Facility at State School II	Emuoha	7,270,165.64	7505925.64	235,760	4.5 %	04-03-2012	30-07-2013	64

Egeda									
-------	--	--	--	--	--	--	--	--	--

Source: Chirococo Engineering Ltd, 2015

Table 2 Federal Government Projects Implemented in University of Portharcourt

S/No	Project Title and Locations	Initial contract sum	Final contract sum	Contract sum variation	% of variation	Initial date of Completion	Final date of completion	Time variation (weeks)	% of period variation
1	Construction of lecture hall complex for CCE, UNIPORT.	62653844	82,642,197.20	-19988353.2	-31.9%	48 weeks	192 weeks	-144	-300%
2	construction of boundary wall fence, Aluu road phase II (UDSS road), UNIPORT	3869893.50	4,529,748.00	-659854.5	-17.1%	48 weeks	96 weeks	-48	-100 %
3	Construction of 4 no. 4 Bedroom semi-detached bungalows, ETF sponsored, UNIPORT.	59193912 x 4	6,928,217.32 x 4	-1008825.32 x 4	-17%	48 weeks	96 weeks	-48	100 %
4	Construction of boundary wall-fencing of Choba a park, PH.	11747493	14,021,593	-2274100	-19.4%	28 weeks	52 weeks	-24	-85.71%
5	2 no. Blocks of public toilets, Choba Park, PH.	1194481.50	1,994,481.50	0	0%	48 weeks	49 weeks	-1	-2.08%
6	Construction of Boundary wall fencing Delta Park, PH.	10,404,041	12,498,341.00	-2094300	-20.1%	12 weeks	36 weeks	-24	-200%
7	2 no. blocks of public toilets, permanent site, UNIPORT.	1,994,481.50	2,114,481.00	-119999.5	-6%	48 weeks	144 weeks	-96	-200%
8	12 Classroom block and toilet, UNIPORT- CBN sponsored	14,545,042	14,545,042	0	0%	48 weeks	48 weeks	0 weeks	0%
9	Construction of generator house/ operation office and store for CCE, UNIPORT.	1,282,080.00	1,282,080.00	0	0%	24 weeks	24 weeks	0 weeks	0%
10	Construction of security dwarf wall fence, UNIPORT	1,205,090.00	1,205,090.00	0	0%	12 weeks	12 weeks	0 weeks	0%
11	8 Classroom Block and Toilet, UNIPORT	10,998,510.75	10,998,510.75	0	0%	48 weeks	48 weeks	0 weeks	0%

Source: Dragon Construction and Engineering Nigeria, Ltd. (2014)

Table 1 and 2 revealed that most of the selected projects show some elements of “fatigue” in that they are experiencing cost and time overrun as analyzed using Earned Value Analysis (EVA) model. Table 1 above, revealed that most of the projects ended up incurring extra cost than budgeted. Only seven (7) projects out of the twenty eight (28) selected projects met the cost consideration. All the selected projects were delayed resulting in time overrun. The implication is that most of these Rivers state education projects failed to meet the cost and time considerations.

Table 2 also revealed that most of the selected Federal government sponsored projects experienced cost and time overrun as analyzed using Earned Value Analysis (EVA) model. The study discovered that five (5) out of the eleven (11) projects were completed within the cost requirements while four (4) were able to meet the time requirements. This imply that most of the projects implemented in Rivers state experienced and are still experiencing cost and time overrun and this does not encourage development in the state. It is also believed that this trend follows with respect to time aspects of these projects, since it is believed that high level of cost overrun attracts time overrun.

Further study into the causes of these variations revealed that the variations (cost and time overrun) noticed were caused by poor knowledge of resource leveling techniques in time of crisis, high level of pilferages during executions, regular design oversight, inadequate attention to pre-contractual investigation by contractors, low level of indigenous project technology. All these factors made it difficult to realize most of these projects within the cost and time criteria and even made it possible for corruption and other vices that contributed to the cost and time variations witnessed in most construction projects in the state. The level of contribution of these factors and the nature of the relationship between them and cost and time variations will be revealed in the next study.

Caution must be applied when interpreting the results obtained from the EVA model as the results are meant for management consumption, not for the contractors. If there is a favourable CV, that means that the project would be completed below the budgeted cost, this does not really confer any advantage to the management/client as the contractor is very unlikely to accept a sum lower than the contact sum which is basically the budgeted cost. In this case, the issue of calculating the forecasted cost does not arise as it is just meaningless in reality.

Conclusion

There are many factors responsible for time and cost variations/overruns in construction projects in Rivers state, Nigeria. These factors may have significantly influenced the realization of time and cost criteria during project executions in the area. Given the level of construction project performance, among others, one can conclude that little government attention towards construction industry cannot help economy to grow. Government needs a sound rethink towards this particular industry as no government can perform without construction projects. Based on the findings of this study, effort must be placed on resource management which will help reduce problem of cost and time

overrun and improve project delivery within the budgeted time and cost in Rivers state. In addition, periodic review of projects cost and time could be a control technique for the successful implementation of public projects.

References

- Akpan, E.O.P. (2013): Project Management: A Catalyst for Rapid Development for Emerging Economies; 15th Inaugural Lecture of the Federal University of Technology, Owerri (FUTO), Imo state, 25th November, pp.22.
- Akpan, E.O.P. & Chizea, E.F. (2007): Characteristics of a Project, *Project Management: Theory and Practice; 3rd Edition*; FUTO Press Ltd, Owerri, pp.4.
- Alaukwu, J.T (2008) Project Cost Overrun and Impacts on Project Execution, *European Journal of Academic Essays*, 2(4), June Edition, pp. 76-93.
- Ayeni, R. A. (2006): Project Monitoring and Implementation in Nigeria; Odseme Publishers; Port Harcourt; pp.46.
- Coke, M.N. and Jepson, Y.I. (2009) *Project Managers- Linking People and Technology*, A paper presented at a conference in Australia by the Association of International Project Managers.
- Echeme, I.I (2015) *Analysis of Critical Factors Hindering Successful Implementation of World Bank-Assisted LEEMP Projects in Imo State*, a PhD Thesis presented to the Postgraduate School, FUTO, May, pp 137.
- Echeme, I.I. and Nwachukwu, C.C. (2009): "Impact of Project Funding on the Implementation of LEEMP Development Project: A Situational Analysis". *International Journal of Development and Management Review*,4(1),197-211, www.ijcrb.com
- Essien, O. (2007): *The Issue of Governance in Africa*; URL Document: www.worldbank.org ; pp.12.
- Coulthrust, K.O., (1990): *Project Management Audits in Project Management Handbook*, Edited by Cleland and King, Van Nostrand Reinhold; New York; pp. 118-125.
- Ferry, T.U. (2002) Environmental factors for Business survival in Africa, *International Institute for sustainable development*, SEED Initiative Research Program, pp. 21.
- Kezner, H. (2004): *Project Management: A System Approach to Planning, Scheduling and Controlling*, 2nd ed.; CBS Publishers and Distributors, New Delhi, India; pp.110.
- Meredith, J.T. (2005) *Project Management: A Managerial Approach*, John Willey and Sons Inc. New York, pp. 43

Nicholas, J.M. (2008): Project Management: The Need; *Project Management for Business and Technology: Principles and Practices, 2nd Edition*, PHI Learning Private Ltd; New Delhi-110001.

Nwachukwu, C.C. & Echeme, I.I. (2016): *Safeguarding Cost Estimates, Project Time, Cost and Quality Management*, Gabtony Prints Ltd., 133/135 Wetheral Road, Owerri, pp. 91-94.

Nwachukwu, C.C., Echeme, I.I., & Okoli, M.N. (2010): "Project Management Factor Indexes; A Constraint to Project Implementation Success in the Construction Sector of a Developing Economy", *European Journal of Scientific Research, Vol.43 No.3*; pp.392, www.eurojournals.com

Nworuh, G.E. (2007): Test for Significance in Multiple Regression; *Fundamentals of Applied Quantitative Techniques for Management Decision*, Bon Associates – HRDC, Nigeria, pp. 90.

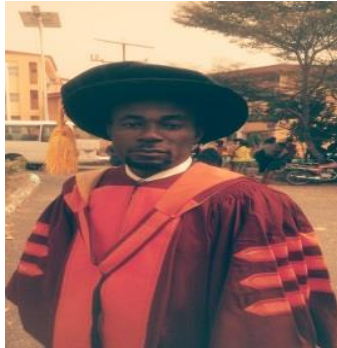
Okorafor G.F. (2014); "Depopulating the Unemployed Mass in Nigeria through Effective Project Delivery". *A paper presented at the 26th Inaugural Lecture of the Federal University of Technology, Owerri (FUTO), Imo State.*

Okongwu, C. (2014): *The Nigeria Economy: Anatomy of a Traumatized Economy with Some Proposals for Stability, 6th ed.*; Dimension Publishing Co., Ltd; Enugu; pp.95

Saunt, B.M. (2010) *Project Management: Strategic Financial Planning, Evaluation and Control*, Vikas Publishing House, PVT Ltd., New Delhi. pp. 88.

Salam, U. (2005): Project management planning and control as a tool for successful development projects, *Journal of Project Management, Vol. 4 (6)*, 45-53.

About The Authors



Ibeawuchi I. Echeme, PhD

Owerri, Nigeria



Ibeawuchi Ifeanyi Echeme is a lecturer in the department of Project Management Technology, Federal University of Technology, Owerri. Echeme has a B.Tech, MSc, and PhD in Project Management Technology and have published more than fifteen (15) articles in both international and national reputable journals. Dr. Echeme has published a textbook on Project Time, Cost and Quality Management. He is a Certified Project Director (CPD) and a member of International Project Management Professionals (IPMP). Dr. Echeme has presented papers in conferences and workshops within and outside the country. He can be contacted through; ibeecheme@yahoo.com. Tel +2348032403835.



Uchenna U. Moneke, PhD

Owerri, Nigeria



Uchenna Ugochi Moneke is a lecturer in the department of Project Management Technology, Federal University of Technology, Owerri. She has a bachelor degree in Polymer Engineering, an MSc and PhD in Project Management Technology. Engr. Dr. Moneke has more than fifteen international and national publications in reputable journals. She is a certified member of the Nigeria Society of Engineers. A professional registered engineer with COREN and an international and local member of Project Management Institute (PMI). Engr. Dr. Moneke can be reached on ucmonk@yahoo.com , Tel. +2348101075158.