Analysis of Cost and Time Variations of Road Construction Project Performance in Imo State, Nigeria [1]

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ABSTRACT

This study analyzed the cost and time variations of road construction project performance in Imo State. The objective is to determine the level of variance with respect to cost and schedule performances of road projects in Imo State. Survey method was used in the study where the performance of 19 road construction projects was evaluated. Earned Value Analysis technique were used to analyze the project data collected. The results indicate that 15 out of the 19 road construction project surveyed suffered cost and time variations at various level of completion stages. Only 4 road construction projects were successfully completed within the planned cost and time specifications. Hence, the study concludes that there is need for construction firms to judiciously apply the techniques of Earned Value Analysis (EVA) management, especially, during project monitoring and control. Based on the above conclusion, the study recommends for the proper planning, effective and efficient payment arrangement as well as reduction in the scope of variation in order to guarantee enhanced road project performance.

Keywords: *Time and cost variations, Road construction, Project performance, Earned value analysis, cost overrun, schedule variances*

1.0 INTRODUCTION

The variations experienced in most road construction projects in Imo State have been attributed to many factors which could be related human or materials. Road construction project performance is no doubt usually affected by many factors. Every investor wants to be sure of the project scope, quality, time and cost. This is because challenges that affect project successful completion have far reaching effects, especially on the owner's interest (Echeme, 2018). Based on the prevailing globally economic landscape, project owners are scaling down or eliminating capital construction projects due to lack of financing, uncertainty over costs, poor management and concerns about potential delays that could impact the feasibility basis of project (Echeme & Nwaribe, 2020; Akpan, 2009).

In Ghana, study reveal increasing cost overruns, delays in completion, unsatisfactory and unmet project objectives in most road construction projects (Gambo, 2008). In South Africa, Olatunji

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(2010) reveal that clients and project team do not have a comprehensive understanding of road projects from inception to completion stages. In Nigeria, Aibinu and Jagboro (2002), warned that road construction delay has become endemic and a lot of funds have been lost as a result of delays in construction projects. They posited that most of the identified factors of delay are traceable to human and material related issues. In Imo State, many road projects failed to be completed in time causing cost overruns. This can be seen from the 19 road construction projects evaluated in this study as shown in Table 1.

Worse case is the fact that a good number of them have accumulated a lot of money but have not been successfully completed. For example, the Avuvu-Amakohia road project, which was scheduled to be completed in seven months, has taken up to thirty-eight months with a case of huge cost overruns due to change in scope and price variations even as the road project is uncompleted. However, some road projects are near completion but with very poor quality workmanship. Irrespective of the previous suggestions made by relevant authors, the problem still persist as more road construction projects in the State are being delayed which attract subsequent abandonment leading to waste of resources released for developmental purposes. However, research to underscore the level of variations in the achievement of cost and time objectives of these road construction projects are lacking. It is against this background that this study mounted to seek to cover for this gap by analyzing the extent of variations in the time and cost performance of road construction projects in Imo State.

Most construction projects executed in Imo State show signs of fatigue due to different levels of cost and time overruns even as most of them are at various completion stages (Akpan, Echeme & Ubani, 2017). However, these abysmal performances of construction projects have been attributed to various factors ranging from human to materials factors (Echeme & Nwaribe, 2020, Amade *et al.,* 2014, Onyekwena, 2012). There is no doubt that the current economic landscape, project owners are scaling down or eliminating capital construction projects due to lack of financing, uncertainty over costs, poor management and concerns about potential delays that could impact the feasibility basis of project (Echeme, 2018). Authors have also pointed out that the factors which affect successful completion of road projects include planning, project team competence and experience (Onyekwena, 2012).

However, the objective of this study is to analyze the level of variations in the cost and time objectives road construction projects in Imo State.

As a result, the following research question was designed;

- What could be the level of variation in the cost and schedule performance of road construction projects in Imo State?

It is expected that the findings of this study will be beneficial to the authorities that are entrusted with the duty of monitoring road project performance in Imo State by equipping them with basis

for which effective road project delivery can be achieved. Also, the findings will help construction companies in Imo State in their quest to execute road projects without hitches by helping them eliminate hindrance in executing projects. Finally, this research will also benefit researchers. It will serve as a good reference material for students and researchers alike who may wish to carry out further research on road construction projects performance.

2.0 CONCEPTUAL REVIEW

Performance indicators are measurable indicators that demonstrate the level of achievement in a project. They provide information to the decision-makers to measure performance and compare them with the intended outputs, outcomes, goals, and objectives, and are chosen to reflect the critical success factors of a project (Akpan, 2013). Several authors agree that project realization within stipulated time, cost, quality specification and user acceptance are known criteria for judging project success (Kezner, 2003, Akpan, et al., 2017, Echeme & Nwaribe, 2020). Nevertheless, project success occurs if the project comes on time, within budget, achieves all the goals originally set for it, and is adopted and used by the clients for whom the project is intended. This should be the basis under which the project should be judged to be either successful or not. However, project managers should not only consider successful performance in project as the realization of some predetermined project goals like time, cost, quality and safety, but also look at the users who do not have similar predetermined goals regarding the project at all (Lim & Mohamed, 2012). Hence, the expectation on the outcome of the project and the perception of project success or failure for everyone will be different, if viewed in the context of Lim and Mohamed (2012).

Cost is one of the most important indicators to consider when measuring contractor performance. Cost is defined as the degree to which the general conditions promote the completion of a project within the estimated budget (Echeme, 2018; Akpan & Chizea, 2005). Project total cost is not only confined to tender sum but also includes cost of variations and claims. Project total cost is the total cost incurred in a project from inception to completion. Cost performance can be measured by comparing contract sum with total project cost to establish if there is cost savings or cost overrun. Cost can be measured in terms of unit cost, percentage of net variation over the final cost (Akpan, et al., 2017). Project performance is generally seen as combination of three factors consists of cost, time and quality (Akpan & Chizea, 2005). Measuring performance of construction project successful or failure depends on whether it achieves what is required or expected. Cost performance is very importance in project to measure the success of projects begins. The successes or failures of projects in construction industry depend on owner's perception towards the actual construction cost and estimated target. If the cost of project is less than the actual planned cost, the project is adjudged to be successful. Cost performance is the most importance indicator of project success used by all parties (Echeme, 2018).

Delays on the delivery of construction projects are seen as one of the most frequent problems in the construction industry (Atkinson, 1999). The aftermath of delays affects all people and

organizations involved in the project. This is especially true for the owners of business since delaying the startup of the project will impede obtaining the expected project revenue and will increase financial costs (Echeme & Nwaribe, 2020).

It presents not only the firm's profitability but also the productivity of an organization at any point in time during the construction processes. In fact, there are many criteria and investigation aspects that can be used to measure the success and failure of any construction project. The past researchers had different perspectives to measure the success and failure of projects. According to Ramus (2012), cost management in construction industry is less effective compared to time management. Literature revealed that various studies in different parts of the world have studied various factors relating to project delivery in terms of quality as the most important factor determining project performance in (Sudan 2012); impact of project delivery systems, cost minimization and project control on construction project success (Frimpong et al., 2013); project cost prediction model (Onyechi 2021); variations in contract in Uganda (Ismaila, 2022); and influences on construction delivery time in South Africa (Steinfort & Walker, 2007). These studies have been carried out and published.

Unfortunately, research on the level of variations in the cost and time objectives of road construction project seem to be lacking, especially with respect to rural road projects in Imo State. Therefore, this study intends to fill this gap by making effort to actually ascertain the level of variations in road construction projects in Imo State, Nigeria.

3.0 METHODOLOGY

Survey research technique was adopted for this research work. This is considered appropriate because the method enabled the researchers to survey and obtain practical data on some road construction projects selected in the area of study for quantitative evaluation and analysis (Nworu, 2019). Secondary data obtained were analyzed qualitatively using appropriate project evaluation technique in order to determine the whether there exists any variation regarding the time and cost objectives.

A total of nineteen (19) road construction projects were surveyed, and they form the population of this study. These data were obtained from the database of Imo State Ministry of Works and Rural Development. However, due to the size of the population, census technique was adopted, and all the project data were analyzed. Secondary data was obtained from documented project files, library and the internet. The data collected includes: names of projects, estimated project cost, total expenditure as at time of study, estimated project duration, project duration as at time of study, percentage completion of project, project status as at time of study. The objective is to determine the extent with respect to cost and time to which the factors have constrained road construction performance. Quality as a criterion may not be emphasized here considering the fact that quality is subjective.

In the analysis of the data collected from the survey, the Earned Value Analysis (EVA) techniques were used. EVA was adopted in achieving the study objective. Akpan, et al., (2017) stated that Earned value management is the most powerful tool in measuring project performance. The optimistic and subjective forecast could be avoided and that project objectives could be met by using an Earned value management system in order to effectively and efficiently integrate the work scope of a project with the schedule and cost parameters for optimum project performance (Project Management Institute, PMBoK, 2005).

Akpan and Igwe (2001); Payne et al., (1999) contributed that cost and schedule variance of the time of update may be evaluated thus.

(i) Cost variance, CV = $\frac{(BCWP-ACWP)100}{BCWP}$ …….. Equation 1

(ii) Schedule Variance, SV = $\frac{(PD-AD)100}{PD}$ ……..Equation 2

Where;

- BCWP = Budgeted cost for work performed
- BCWS = Budgeted cost for work scheduled
- ACWP = Actual cost for work performed
- PD = Planned Duration
- AD = Actual Duration

4.0 DATA ANALYSIS AND DISCUSSION

The data for this study are presented in this section. The data were generated from the project performance data as provided by the Imo State Ministry of Works and Rural development. Secondary data presentation and analyses are shown in Table 1 to 3.

Table 1. Performance data for the sampled projects

S/N	Project Names	Project Planned Cost	Total Expenditure as at time of study	Project Planned Duration	Project Duration as at time of study	Project Construction Stage as at time of study	Percentage completion of project	Project Status	Causal factors
1	Housing-Umuguma Road	245500000	135000000	8months	36months	Partly Asphalted, partly filled with laterite	40%	Uncompleted	Ineffective project planning; delay in payment of contract sum; Use of
2	Nekede-Ihiagwa Road	340560000	205000000	10months	48months	Asphalted	65%	Uncompleted	

3	Chukwumawooha Road	280000000	180000000	8months	28months	Partly asphalted and partly filled with laterite	45%	Uncompleted	incompetent contractors; Construction party's financial management; materials price fluctuation; change in project scope; Untimely availability of construction resources.
4	Azaraegbelu-Avuvu Road	257650000	195000000	7months	38months	Partly asphalted and filled with laterite	45%	Uncompleted	
5	Avuvu-Amakohia Road	234500000	97000000	7months	38months	Filled with laterite	25%	Uncompleted	
6	Amakohia-Okwu Road	187450000	59000000	8months	36months	Filled with laterite	20%	Uncompleted	
7	Ahiara-AforOru Road	165000000	120000000	7months	32months	Partly asphalted and filled with laterite	45%	Uncompleted	
8	Ahiara-Aba Road	210540000	157000000	12months	28months	Partly asphalted and filled with laterite	40%	Uncompleted	
9	Mbaise Ring Road	400000000	400000000	12months	12months	Commissioned	100%	Completed	
10	Amuzi-Nguru Road	234540000	120000000	9months	28months	Filled with laterite	40%	Uncompleted	
11	Nguru-Ogbor Road	325650000	187000000	12months	28months	"	35%	Uncompleted	
12	Amakohia-Eziama Road	186450000	870000000	7months	36months	Partly asphalted and filled with laterite	45%	Uncompleted	
13	Ndegwu-Ogaku Road	135650000	65000000	12months	28months	Filled with laterite	30%	Uncompleted	
14	Owu-Avuvu Road	125000000	55000000	6months	36months	"	35%	Uncompleted	
15	Umuguma-Okuku Road	182600000	90000000	8months	28months	Partly asphalted and filled with laterite	45%	Uncompleted	
16	Okpuala-Owu Road	146750000	47000000	9months	26months	Graded	10%	Uncompleted	
17	Umuanunu Road	75450000	75450000	4months	5months	Commissioned	90%	Completed but broken	
18	Akachi Road	257540000	257540000	7months	7months	Commissioned	100%	Completed	
19	Okpala-Igwurita Road	20000000	200000000	7months	7months	Commissioned	100%	Completed	

***Source**: Imo State Ministry of works and Rural Development, (2024).*

Table 1 shows the different road construction projects in Imo State evaluated for this study. The data includes names of road projects, initial cost, expended amounts, initial duration, and consumed duration, status of projects, percentage completion as well as the causal factors that have affected the performance of the road construction projects in Imo State.

Table 2 shows the projects examined, their individual planned costs, expenditure as at time of study, cost variance (CV), planned project duration, project duration as at time of study, schedule variance (SV) and the status of the projects examined.

Table 2. Earned Value Analysis Scores for the Nineteen Selected Road Projects

S/N	PROJECT NAME	BUDGETED COST (BCWP)	EXPENDITURE AS AT 31/12/2024 (ACWP)	COST VARIANCE	PLANNED DURATION	ACTUAL DURATION	SCHEDULE VARIANCE	PROJECT STATUS
1	Housing-Umuguma Road	98200000	135000000	-37.5%	8months	36months	-350%	Uncompleted
2	Nekede-Ihiagwa Road	221364000	205000000	7.4%	10months	48months	-380%	Uncompleted
3	Chukwumawoha Road	126000000	180000000	-42.9%	8months	28months	-250%	Uncompleted
4	Azaraegbelu-Avuvu Road	115942500	195000000	-68.2%	7months	38months	-442.9%	Uncompleted
5	Avuvu-Amakohia Road	58625000	97000000	-65.5%	7months	38months	442.9%	Uncompleted
6	Amakohia-Okwu Road	37490000	59000000	-57.4%	8months	36months	-350%	Uncompleted
7	Ahiara-AforOru Road	74250000	120000000	-61.6%	7months	32months	-357%	Uncompleted
8	Ahiara-Aba Road	84216000	157000000	-86.4%	12months	28months	133.3%	Uncompleted
9	Mbaise Ring Road	400000000	400000000	0%	12months	12months	0%	Completed
10	Amuzi-Nguru Road	93816000	120000000	-27.9%	9months	28months	-211.1%	Uncompleted
11	Nguru-Ogbor Road	113977500	187000000	-64.1%	12months	28months	-211.1%	Uncompleted
12	Amakohia-Eziama Road	83902500	87000000	-3.7%	7months	36months	-414.3%	Uncompleted
13	Ndegwu-Ogaku Road	4069500	65000000	-59.7%	12months	28months	-133.3%	Uncompleted
14	Owu-Avuvu Road	43750000	55000000	-25.7%	6months	36months	-500%	Uncompleted
15	Umuguma-Okuku Road	82170000	90000000	-9.5%	8months	28months	-250%	Uncompleted
16	Okpuala-Owu Road	14675000	47000000	-220.3%	9months	26months	-188.9%	Uncompleted
17	Umuanunu Road	75450000	75450000	0%	4months	5months	-25%	Uncompleted
18	Akachi Road	257540000	257540000	0%	7months	7months	0%	Completed
19	Okpala-Igwurita Road	20000000	200000000	0%	7months	7months	0%	Completed

The cost and schedule variances as determine in Table 2 were isolated and presented in Table 3 for emphasis and clarity.

Table 3 Road construction projects examined, the cost and schedule variances

S/N	PROJECT NAMES	COST VARIANCE	SCHEDULE VARIANCE
1	Housing-Umuguma Road	-37.5%	-350%
2	Nekede-Ihiagwa Road	7.4%	-380%
3	Chukwumawoha Road	-42.9%	-250%
4	Azaraegbelu-Avuvu Road	-68.2%	-442.9%
5	Avuvu-Amakohia Road	-65.5%	442.9%
6	Amakohia-Okwu Road	-57.4%	-350%
7	Ahiara-AforOru Road	-61.6%	-357%
8	Ahiara-Aba Road	-86.4%	133.3%
9	Mbaise Ring Road	0%	0%
10	Amuzi-Nguru Road	-27.9%	-211.1%
11	Nguru-Ogbor Road	-64.1%	-211.1%
12	Amakohia-Eziama Road	-3.7%	-414.3%
13	Ndegwu-Ogaku Road	-59.7%	-133.3%
14	Owu-Avuvu Road	-25.7%	-500%
15	Umuguma-Okuku Road	-9.5%	-250%
16	Okpuala-Owu Road	-220.3%	-188.9%
17	Umuanunu Road	0%	-25%
18	Akachi Road	0%	0%
19	Okpala-Igwurita Road	0%	0%

Table 3 shows that the fifteen (15) of the 19 road construction projects selected and analyzed experience fatigue in that they incurred time and cost overrun at different level of completion as at 31st December 2024. Four road projects, however, recorded 0% cost variance which suggests that there was no cost overrun. Similarly, two road projects recorded 0% schedule variance which also shows that there was no time overrun. Additionally, Owu-Avuvu road project recorded the highest schedule variance (-500%), while Okpuala- Owu Amakohia road recorded the highest cost variance (-220.3%)

4.1 Result Discussion

The performance data for the road construction projects examined in this study are depicted in Table 1. The table shows information relating to the projects which comprise project names, project estimated costs, total expenditure for each project, estimated project durations, stages of construction of the projects, percentage completion of the projects as well as statuses of the projects

as at the time of this study. The data as provided in Table 1 were necessary as they helped to understand the actual performance of the selected road construction projects evaluated. The data were further analyzed in order to show how the schedule and cost performances were affected by evaluating their individual schedule and cost variances. The information on this is shown in Tables 2 and 3. The road construction projects with 0% cost variance and 0% schedule variance indicate timely completion and effective use of funds; while the rest with negative values imply that their execution takes more time and more cost than planned (time and cost overruns). Overall, our findings reveal that the high level of variations in time and cost objectives of road construction projects evaluated in this study were attributed to the presence of the human and materials factors yet to be analyzed in this study (see Table 1).

Care should be taken when analyzing and interpreting the results obtained from the EVA model as the results are meant for management consumption, not for the contractors (Akpan et al., 2017). This is because, if there exists a favourable cost variance (CV), the implication is that the project would be completed below the budgeted cost. However, this does not really result to any advantage to the management/client as the contactor is very unlikely to accept a sum lower than the contacted total sum which is basically the budgeted cost (Echeme & Nwaribe, 2020). In this case, the issue of calculating the forecasted cost does not arise as it is just meaningless in reality (Akpan et al., 2017).

However, it is difficult to discuss schedule variance for the whole project as this term seems to apply to individual work packages. As posited by Akpan et al., (2017), it is even strange to use cost data to determine the schedule performance index and schedule variance. In a situation where the work plan is presented in the network scheduling format to help in determining among others the project duration, the project with work packages having floats/slack and negative schedule variance implying longer time duration for the work package under consideration, and the project as a whole may not necessarily experience time overrun (Echeme, 2018). There is therefore no need to determine the forecasted time when the whole project is involved, and this information was not examined in Table 2. Also, it could be observed from Table 2 that most projects experienced time overrun, even when they are not yet completed.

5.0 CONCLUSION

There is need for construction firms to put more effort into addressing cost and time overrun to avoid litigations and other relate issues that may accompany them. This can be done by the judicious application of Earned Value Analysis (EVA) techniques during project monitoring and control. Again, in view of the fact that human related factors led to the projects suffering both time and cost overruns, it is therefore recommended that proper project planning, effective and efficient payment arrangement as well little or no variation in the scope of work should be ensured so as to guarantee good project performance.

Additionally, in view of the fact that materials related factors contributed to the projects suffering both cost and time overruns, the study recommends that construction materials should be acquired early enough so as to avoid price fluctuation issues and inflation, while considering the holding costs. Again, contractors should at all times avoid sharp practices aimed at unnecessarily reducing costs at the expense of quality, just get contract and fail.

5.1 Contribution to Knowledge

Literature has shown that researches on this topic is almost lacking; where related topics are found, attention has been on factors affecting construction project performance generally. There is no clear distinction on the level of cost and time variations associated with construction project performances, especially road construction projects in Imo State. This research has successfully filled the gap.

REFERENCES

Aibinu, A.A. & Jagboro, G.O. (2002). The effects of construction delays on project delivery in Nigerian construction industry. *International Journal of Project Management,* 20, 593-599.

Akpan, E.O.P. & Igwe, O. (2001). A methodology for determining price variation in project execution. *Journal of Construction Engineering and Management of the American Society of Civil Engineers* (ASCE), 127(5), 367-373.

Akpan, E.O.P. (2013). *Project Management: A Catalyst for Rapid Industrial Development for Emerging Economies*. 15th Inaugural Lecture of the Federal University of Technology, Owerri (FUTO), Imo State.

Akpan, E.O.P. & Chizea, E.F. (2005). *Project Management: theory and practice*, 3rd edition. Owerri, Imo state. FUTO Press Limited.

Akpan, E.O.P., Echeme, I.I., & Ubani, E.C. (2017) Situational Analysis of Time and Cost Performance of Local Empowerment and Environmental Management Project, *PM World Journal,* Vol. VI, Issue III, March, pp.1-19, www.pmworldjournal.net

Amade, B., Akpan, E.O.P., Ukwuoma, F.P.O. & Alajemba, C.C. (2014). Project cost contingency in the Nigerian construction industry. *International Journal of Research in Management, Science & Technology,* 2(2).

Atkinson, R. (1999). Project management: cost, time and quality, two best guesses and a phenomenon, it's time to accept other success criteria. *International Journal of Project Management* 17, 337–342.

Echeme, I.I. (2018) Time and Cost Performance of Oil Well Drilling and Completion Projects in Warri Delta State, Nigeria: A Situational Analysis, *PM World Journal, Vol. VII, Issue VI*, June, www.pmworldjournal.net

Echeme, I.I. & Nwaribe, N. (2020) Evaluation of Delay Related Factors in Niger Delta Development Commission Construction Projects in University of Port Harcourt, *Global Scientific Journal, 8 (3)*, March, pp. 626- 647, ISSN 2320-9186

Gambo, N. (2008). "*Mathematical modeling of final cost of construction projects in Nigeria*" Unpublished M.Eng thesis Civil Engineering Department, Bayero University, Kano, Nigeria.

Ismaila, O.F.A. (2022). Variations in contract: A misconstrued concept in Uganda. *The Nigerian Quantity Surveyor*, 7, 12-14.

Kezner, H. (2003), *Introduction to Project Management.* 5th Edition*;* Van Nostrand Reinhold; New York.

Lim, S. C. & Mohamed, M. Z. (2012), "Criteria of project success: an exploratory reexamination". *International Journal of Project Management*, 17(4), 243-248.

Nworu, G.E. (2019). Research Methodology for Trainers and Trainees, 5th Edition, Ambix Publishers, Owerri, Nigeria, pp. 56.

Olatunji, O. (2010) *Survey of South Africa Construction Contract Variations from 2000-2007*. Aromolaran Publishing Company Ltd, Ibadan, Nigeria.

Onyechi, A.I. (2021). Valuation of prices fluctuations on Nigeria contracts. *NIQS Quarterly Journal,* 8(1), 9-11.

Onyekwena, P.I.C. (2012). *Study of the factors affecting the cost escalation of construction projects in Nigeria; A case study of projects in the South East Geopolitical Zone*. M.Sc research work; Department of Construction Management Federal University of Nnamdi Azikwe.

Payne, A.C., Chelsom, J. V. & Reavill, L. R. P. (1996), *Management for Engineers*. John Wiley & Sons, Chichester, England.

Project Management Institute (2005). *Practice Standard for Earned Value Management*. Newtown Square, Pennsylvania, Project Management Institute.

Ramus, B.C. (2012). *Cost fluctuation of some building materials in Enugu state from 1999 to 2010*. M.Sc Research Work Department of Building; Federal University of Nnamdi Azikwe, Awka.

Steinfort, P. & Walker, D. H. T. (2007), *Critical success factors in project management globally and how they may be applied to aid project*. Proceedings of the PMOZ Achieving Excellence – 4th Annual Project Management Australia Conference, Brisbane, 28-31

Sudan, J.W. (2012). *Contract practice for quantity Surveyors*, Heinemann London. Pp 77-112.

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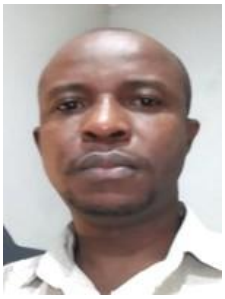

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