APPRAISAL OF THE UTILIZATION OF CONSTRUCTION PROGRAMME (CP) IN BUILDING PROJECTS IN EDO STATE, NIGERIA

Pius Ikpehai Momodu[1], Prof. Kevin Chuks Okolie[2], Dr. Peter Uchenna Okoye[3]

[1] Department of Building, Nnamdi   Azikiwe University, Awka, Nigeria
[2] Department of Building, Nnamdi Azikiwe University, Awka, Nigeria
[3] Department of Building, Nnamdi Azikiwe University, Awka, Nigeria

ABSTRACT :

This study is aimed at evaluating the utilization of construction programme with a view to establishing its effect on time performance of building projects in Edo State. Structured questionnaire was used to collect data from the respondents in Auchi, Ekpoma, and Benin City, Edo State while references were made to published text books, journals and the internet for secondary sources. The data collected were recorded in tables and interpreted using simple percentage and mean ranking formula, while the research adopted probability (simple random) sampling for selection of population and 'Taro Yamane formula' for sample size selection. The research hypotheses were tested using regression analysis method, using STATA version 24.0. The results obtained from the analysed data were related with previous studies upon which summary of the findings was based. The findings of this study show that in the study area: (1) 'Level of Awareness of Construction Programme Utilization' significantly affects time performance of building projects in Edo State; (2) 'Construction Programme' does significantly affects time performance of building projects in Edo State; (3) There is a relationship between 'Level of Awareness of Construction Programme Utilization' and 'Effect of Construction Programme' on time performance of building projects in Edo State. (4) 'Construction Programme Directly Affects Time Performance, Compared to Level of Awareness of Construction Programme' on building projects in Edo State. The results of the test of hypotheses in Tables 4.11 and 4.12, corroborated by Nur, *et al.* (2019), Olalusi and Otunola (2012) and Pablo, *et al.* (2017) reveal that construction programme utilization directly affects time performance, compared to level of awareness of construction programme in building projects in the study area.

Key words: Utilization, Time Performance, Level of Awareness

1. INTRODUCTION

According to Pablo, Graeme and Maria (2017), a building project needs to have a defined completion date which will serve as a time performance measurement baseline; while Nur, Faizul, Loo and Ee (2019) assert that several recent studies reveal that the construction industry is perceived to be underachieving due to failure in terms of time performance. Most often, this failure in time performance results in building projects abandonment (Aiminhiefe, 2022; Olalusi and Otunola, 2012). However, in the building industry, there are countless examples of projects which fail to meet their original completion dates (e.g. Alaghbari, Kadir, Salim and Ernawati, 2007; Gündüz, Nielsen and Özdemir, 2013; Mahamid, Bruland and Dmaidi, 2012; Ruqaishi and Bashir, 2015). This recurrent problem of projects delay, considering 'delay' here as 'not meeting the original completion date', has been researched under multiple perspectives: economic (Yates, 1998), social (Hamzah, Khoiry, Arshad, Tawil and Che Ani, 2011), legal (Keane and Caletka, 2008), analytical (Alkass, Mazerolle and Harris, 1996), programmatic (Braimah, 2014), etc., to cite just a few. Projects delay have been studied from all parties' perspectives too: contractor's (Mahamid, 2013), government's (Orangi, Palaneeswara, and Wilson, 2011), country's (Ogunlana, Promkuntong and Jearkjirm, 1996), suppliers' (Choi and Hartley, 1996), and workers' (Mahamid, 2013). Considering the causes of projects delay, many factors have been identified: poor planning and scheduling practices (Assaf and Al-Hejji, 2006; Assaf, Al-Khalil and Al-Hazmi, 1995; Ibironke and Elamah, 2011; Pall, Bridge, Skitmore and Gray 2016), poor site management (Abdul-Rahman, Berawi, Mohamed, Othman and Yahya, 2006; Alaghbari, W., Kadir, M.R.A., Salim, A., and Ernawati, 2007), labor shortage and lower productivity (Odeh and Battaineh, 2001; Sweis, Abu Hammad and Shboul, 2008), problems with materials supply chain and procurement (Lo, Fung and Tung, 2006; Ballesteros-Pérez, Del Campo-Hitschfeld, Mora-Melià and Domínguez-Santos, 2015), reworks of defective units or units with insufficient quality (Ballesteros-Pérez, 2017; Forcada, Rusiñol, Macarulla and Love, 2014), contractor's and/or client's financial difficulties (Mansfield, Ugwu and Doran, 1994; Ogunlana, S.O., Promkuntong, K., and Jearkjirm, V., 1996), design changes (Arditi, Akan and Gurdamar, 2006; Mezher and Tawil, 1998), poor communication and co-ordination (Fimpong and Oluwoye, 2003), unexpected field interferences (Alarcón, Diethelm, Rojo and Calderon, 2005), adverse weather (Ballesteros-Pérez, et al., 2015; Ballesteros-Pérez *et al.*, 2017), legal disputes (Yogeswaran, Kumaraswamy and Miller, 1998), to cite just a few. It may not be a surprise then that delay in the final completion of projects is acknowledged in many sectors as one of the most common, costly, complex, and risky problems a project manager can face (Fawzy and El-

Adaway, 2012). However and quite paradoxically, among all factors that cause projects delay, poor planning and scheduling practices consistently stand out as an over-arching theme spanning the most recurrent delay-causing problems (AlSehaimi and Koskela, 2008).

AIM AND OBJECTIVES

The aim of this study is to evaluate the utilization of construction programme with a view to establishing its effect on time performance of building projects in Edo State.

1.1. OBJECTIVES OF THE STUDY

i.   To identify level of awareness of construction programme utilization in building projects in Edo State.
ii.   To identify effect of construction programme on time performance of building projects in Edo State.
iii.   To establish a relationship between level of awareness of construction programme utilization and its effect on time performance of building projects in Edo State.

1.2. Research Hypotheses

Note: Only the null hypotheses are stated.
1. H_0 = Level of awareness of construction programme utilization does not significantly affects time performance of building projects in Edo State.
2. H_0 = Utilization of construction programme does not significantly affects time performance of building projects in Edo State.
3. H_0 = There is no relationship between level of awareness of construction programme utilization and effect of construction programme on time performance of building projects in Edo State.

1.2. METHODOLOGY

The research design adopted probability (simple random) sampling for selection of population, and adopted 'Taro Yamane formula' for sample size selection. The research adopted descriptive (case-study) survey approach. Nominal scale was used to identify the study population, ratio scale was used in scaling the data to be analyzed; level of awareness of construction programme utilization and effect of construction programme on time performance of building projects in Edo State were scored with a four point Likert scale.The technique adopted in analyzing the collected data is regression analysis method, using STATA version 24.0.

1.3. RESULTS AND DISCUSSION

Table 1:   Summary of Correlation analysis between the major dependent and independent variables

```
. correlate ECP LACPU TP
(obs=182)

                 ECP      LACPU        TP

       ECP    1.0000
     LACPU    0.9862     1.0000
        TP    0.9780     0.9722     1.0000
```

Source: Analysis result from STATA version 24

Table 1 shows summary of correlation analysis between the major dependent and independent variables. The test shows positive and strong correlation of the independent variables (ECP & LACPU) with the dependent variable (TP). However, the variables would be tested using linear regression for statistical significance measuring predictabilities.

Key: ECP   = (*Effect of construction programme on time performance of building projects in Edo State*)
        LACPU = (*Level of awareness of construction programme utilization in building projects in Edo State*)
        TP   = (*Time performance of building projects in Edo State*)

Table 2:   Summary of Regression Analysis for Hypothesis One

```
. regress TP LACPU
```

Source	SS	df	MS		
Model	138.538487	1	138.538487		
Residual	8.02744688	180	.044596927		
Total	146.565934	181	.809756542		

Number of obs = 182
F(1, 180) = 3106.46
Prob > F = 0.0000
R-squared = 0.9452
Adj R-squared = 0.9449
Root MSE = .21118

TP	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
LACPU	.914603	.0164097	55.74	0.000	.8822229	.9469831
_cons	.1929514	.0503921	3.83	0.000	.0935161	.2923866

Source: Analysis result from STATA version 24

Table 2 represents summary of regression analysis for hypothesis one, which states: 'Level of awareness of construction programme utilization does not significantly affects time performance of building projects in Edo State'. The F-test, $F(1, 180) =3106.46$, Adj $R^2 = 0.9449$ showing strong predictive effect of Level of awareness of construction programme utilization (LACPU) on time performance (TP) with t value of 55.74 at a constant t of 3.83 and p-value $<0.05 = 0.000$ with coefficient of 0.914603, std err. of 0.0164097, from the observation of 182 sampled respondents. Decision: since the Adj. R^2 shows a contribution of 94% on the TP and p-value $0.000 < 0.05$ level of significance, we reject the null hypothesis with extremely high confidence interval of 94% and state that Level of awareness of construction programme utilization significantly affects time performance of building projects in Edo State.

Table 3:   Summary of Regression Analysis for Hypothesis Two

```
. regress TP ECP
```

Source	SS	df	MS		
Model	140.190649	1	140.190649		
Residual	6.37528493	180	.03541825		
Total	146.565934	181	.809756542		

Number of obs = 182
F(1, 180) = 3958.15
Prob > F = 0.0000
R-squared = 0.9565
Adj R-squared = 0.9563
Root MSE = .1882

TP	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
ECP	.9418493	.0149705	62.91	0.000	.9123091	.9713895
_cons	.245383	.0438773	5.59	0.000	.1588029	.3319631

Source: Analysis result from STATA version 24

Testing hypothesis two, the above table shows the summary of result obtained from the test. Mean and standard deviation of the test is 3.785 ± 0.086 where the number of sample size = 182, degree of freedom = 180, spearman's correction (r) -0.757 and t-cal. 32.958 with t-crit. 1.660 and p-value result 0.006 at 0.05 level of significance. The remark is that it has a strong negative correlation. Decision: since the t-crit is lower than t-cal., we will not afford to accept the null hypothesis. Thus, construction programme does significantly affects time performance of building projects in Edo State.

Table 4:   Summary of Regression Analysis for Hypothesis Three

```
. regress TP ECP IACPU
```

Source	SS	df	MS		
Model	140.508727	2	70.2543633	Number of obs =	182
Residual	6.0572075	179	.033839148	F(2, 179) =	2076.13
				Prob > F =	0.0000
				R-squared =	0.9587
				Adj R-squared =	0.9582
Total	146.565934	181	.809756542	Root MSE =	.18395

TP	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
ECP	.6745541	.088403	7.63	0.000	.500108	.8490002
LACPU	.2647581	.086356	3.07	0.003	.0943513	.4351648
_cons	.215338	.0439934	4.89	0.000	.1285256	.3021504

Source: Analysis result from STATA version 24

Table 4 shows summary of regression analyses of hypothesis three, that states: 'There is no relationship between level of awareness of construction programme utilization and effect of construction programme on time performance of building projects in Edo State', Table 4.13 shows the F-test, $F(2, 179) = 2076.13$, Adj $R^2 = 0.9582$, showing interrelatedness and predictability among LACPU, ECP and TP   with t value of 7.63 for ECP, 3.07 for LACPU at obtained cons of 4.89 at p-value $<0.05 = 0.000$ for ECP and 0.003 for LACPU with high coefficient of 0.6745541 and std err. value of 0.088403 for ECP; whereas LACPU coefficient and std err value are 0.2647581 and 0.086356 respectively, being lower than ECP with the same observed 182 sampled respondents. Decision: since the Adj. R^2 with a predictive 96% and p-value $0.000 < 0.05$ level of significance, we reject the null hypothesis with confidence interval of 84% and state that there is a relationship between level of awareness of construction programme utilization and effect of construction programme on time performance of building projects in Edo State.

1.4. DISCUSION OF FINDINGS

1.   The Adj. R^2 of the regression analysis result for hypothesis I (Table 5) shows a contribution of 94% on the TP and p-value $0.000 < 0.05$ level of significance, hence, the null hypothesis was rejected with extremely high confidence interval of 94% which states that **'Level of Awareness of Construction Programmed Utilization'** significantly affects time performance of building projects in Edo State.

2.   The t-crit of the regression analysis result for hypothesis II (Table 6) was lower than t-cal., which remarked a strong negative correlation, hence, the null hypothesis rejected, thus, **'Construction Programme'** does significantly affects time performance of building projects in Edo State.

3.   The Adj. R^2 of the regression analysis result for hypothesis III (Table 7) shows a predictive 96% and p-value $0.000 < 0.05$ level of significance, hence, the null hypothesis was rejected with confidence interval of 84%, which states that there is a relationship between **'Level of Awareness of Construction Programme Utilization'** and **'Effect of Construction Programme'** on time performance of building projects in Edo State.

1.5. CONCLUSION/SUMMARY

From the results of the analyses of the hypotheses in Tables 4.11 and 4.12, corroborated by Nur, *et al.* (2019), Olalusi and Otunola (2012) and Pablo, *et al.* (2017), it is inferenced that: 'Level of Awareness of Construction Programme' as well as 'Construction Programme Utilization', both significantly affect time performance of building projects in Edo State.

Consequently, the path diagram of the structural equation model developed from the regression analysis of hypothesis three (Figure 4.1) validates the significant relationship between 'Level of Awareness of Construction Programme Utilization' and 'Effect of Construction Programme' on time performance of building projects in the study area.

For building projects executed in Edo State not to suffer abandonment resulting from failure in time performance, construction programme should be developed and effectively utilized (Ibironke and Elamah, 2011; Pall, *et al.* 2016).

REFERENCES

1. Aiminhiefe, M. I. (2022). Environmental effects of abandoned building projects in Edo State, Nigeria. *Direct Research Journal of Public Health and Environmental Technology*, *7*(5), 68-74. https://doi.org/10.26765/DRJPHET07351-9486

2. Alkass, S., Mazerolle, M., and Harris, F. (1996). Construction delay analysis techniques. *Construction Management and Economics*, *14*(5), 375-394. https://doi.org/10.1080/014461996373250

3. AlSehaimi, A., and Koskela, L. (2008). What can be learned from studies on delay in construction? *Proceedings for the 16th Annual Conference of the International Group for Lean Construction*, 95-106.

4. Assaf, S.A., and Al-Hejji, S. (2006). Causes of delay in large construction projects. *International Journal of Project Management*, *24*(4), 349-357.https://doi.org/1 0.101 6/j.ijproman.2005.1 1.010

5. Atamewan, E. E. (2021). Abandonment of housing projects in Nigeria. *Appraisal of the Environmental and Socio-economic Implications. European Journal of Environmental and Health Sciences, 1*(4), 1-6.

6. Council of Registered Builders of Nigeria (CORBON, 2021). The role of Builders in Nigeria: *Preparation of Construction Programme.* www.corbon.gov.ng/buildersdocuments/constructionprogramme

7. Dvir, D., Raz, T., and Shenhar, A. J. (2003). An empirical analysis of the relationship between project planning and project success. *International Journal of Project Management*, *21*(2), 89-95.

8. Fox, N., Hunn, A. and Mathers, N. (2009). Sampling and sample size calculation. *National Institute for Health Research*, *UK.*

9. Hanachor, M. E. (2012). Community development project abandonment in Nigeria: Causes and effects. *Journal of Education and Practice, 3*(6), 33-36.

10. Ibironke, O. T., and Elamah, D. (2011). Factors Affecting Time, Cost and Quality Management in Building Construction Projects: *FUTY Journal of the Environment, 6*(1), 6-7.

11. Idoro, G. (2012). Evaluating levels of project planning and their effects on performance in the Nigerian construction industry. *Construction Economics and Building, 9*(2), 39-50.

12. Iruobe, J. (2003). Reactivation of abandoned building projects in Nigeria. *The Professional Build,* 43-46.

13. Keane, P.J., and Caletka, A.F. (2008). *Delay analysis in construction contracts.* Oxford, U.K: Wiley-Blackwell. https://doi.org/10.1002/9781444301144

14. Mansfield, N., Ugwu, O., and Doran, T. (1994). Causes of delay and cost overruns in Nigerian construction projects. *International Journal of Project Management*, *12*(4), 254-260. https://doi.org/10.1016/0263- 7863(94)90050-7

15. Momodu, I. (2014). *Appraisal of planning techniques on building projects in Lagos state.* Unpublished PGD Project, Department of Quantity Surveying, Federal University of Technology, Akure: Author.

16. Odeh, A.M., and Battaineh, H.T. (2001). Causes of construction delay: Traditional contracts. *International Journal of Project Management*, *20*(1), 67-73. https://doi.org/10.1016/S0263-7863(00)00037-5

17. Ogunlana, S.O., Promkuntong, K., and Jearkjirm, V. (1996). Construction delays in a fast-growing economy: Comparing Thailand with other economies. *International Journal of Project Management*, *14*(1), 37-45. https://doi.org/10.1016/0263-7863(95)00052-6

18. Olalusi, O. and Otunola, A. (2012). Abandonment of building projects in Nigeria – Review of causes and solutions. *International Conference on Chemical, Civil and Environmental Engineering C.C.E.E.),* Dubai.

19. Oseghale, G.E. and Ata, O. (2008). Reasons for Delay in Building Projects. *Journal of the Nigerian Institute of Building,* 3(5) 61-67.

20. Pablo, B., Graeme, D., and Maria, C.G. (2017). Do projects really end late on the shortcomings of the critical scheduling techniques? *Journal of Technology and Science Education, JOTSE,* 8(1), 17-33. ISSN: 2013-6374. https://doi.org/10.3926/jotse.303

21. The National Building Code (2006). Control of Building Works (Section 13): *Design/Pre-costruction State – Contract Documents* www.researchgate.net/publication

22. The Royal Institute of British Architects (2013). *Plan of work: Overview.* Poland place, London: Author. www.ribaplanofwork.com

23. Yogeswaran, K., Kumaraswamy, M.M., and Miller, D.R.A. (1998). Claims for extensions of time in civil engineering projects. *Construction Management and Economics*, *16*(3), 283-293. https://doi.org/10.1080/014461998372312