Penerbit **Akademia Baru**

Advanced Research in Business and Management Studies

Analysis of Changes in Building Construction Project Plan on Project Success in Akure Metropolis, Ondo State, Nigeria

Open Access

David Love Opeyemi[1,*], Omonori A. A[1], Aladejebi A. A[1]

[1] Department of Project Management Technology, School of management technology, Federal University of Technology, Akure, Nigeria

ARTICLE INFO	ABSTRACT
	This study conducted the analysis of changes in building construction project plan on project success during project execution in Akure Metropolis, Ondo state, Nigeria. The total sample size used for the study was 169, however 165 questionnaires were retrieved and analyzed. The data collected were analyzed using descriptive statistics, the Relative Importance Index (RII) and the hypothesis for the study were tested using Pearson Product moment correlation coefficients which revealed that changes in project plan have a statistical significant effect on project success, with $r = -0.560$, and $p = 0.003$. This results shows that there is a negative correlation between project success and effects of changes in project plan, which implies that as the effects of changes in project plan increases, which is caused by frequent changes in project plan, the success of the project tends to diminishes. From the findings of the research, the most important criteria for project success is the satisfaction of project stakeholders (RII = 0.965). The top effect of changes in project plan is increase in project cost (RII = 0.996). The study showed that having a knowledge – base of previous similar projects (RII = 0.989) is the most important way to mitigate changes in project plan. The study concludes that any alteration to the changes in project plan do have effects on the success of the project.

1. Introduction

1.1 Background to the Study

Managing projects is one of the oldest and most respected endeavors of mankind highlighted by the achievements of the builders of pyramids, the architects of ancient cities, the mason and craftsmen of the Great wall of China and other wonders of the world.

The Construction industry is all important and indispensable to the socio – economic development of most nations in the world. As Opined by Helen *et al*., [9], the construction industry is the single largest industry that greatly subscribe to the development of a Nation. In contributing that the Construction industry globally generates employment and contributes between 2% - 10% to the GDP of most developing Countries. Bruno and Fadhin [5] stated that the construction industry is

---

* *Corresponding author.*
E-mail address: loveopeyemidavid@gmail.com (David Love Opeyemi)

a complex system of construction stakeholders (clients, consultants, contractors, manufacturers and distributors, suppliers, sub – contractors and end – users, etc), building works (residential, commercial, industrial, etc), civil and heavy engineering works (roads, railways, bridges, servers, dams, airports, jetties, cofferdams, caissons, tunnels, refineries, power station etc) and construction training establishments (research institutes, polytechnics and universities).

Building sector of the construction industry is a major factor in the social and political integration of the society and ranks as one of the major budgetary areas of developing economies, Nwachukwu, [15]. The products of the construction industry are desired mainly for the services which they help to create as most business, social, religious, economic, industrial activities etc operate on building infrastructure, Nwachukwu, [14]. The construction industry is likely to remain a major area of development activity as the need for the provision and replacement of infrastructure become more important in the years ahead.

In order to have competitive advantages in today's chaotic global economy, companies are turning to project management to consistently deliver business results, lower costs, achieve great efficiencies, improved customer and stakeholder's satisfaction, Katarzuyna and Giuseppe [11]. Ever since project management has become a formal discipline, the quality and importance of project planning has been considered a major cornerstone of every successful project. Akande *et al.*, [1] are of the view that Project Planning, an indispensable component of Project Management is of a high importance in avoiding project failure and abandonment. This is due to the fact that, construction project is a complex process that involves many stakeholders, long project durations and complex contractual relationships, Oyegoke *et al.*, [17]. In explaining the importance of planning in a project, Pedro [18] opines that planning process in creating a Project plan consists of 48% of all Processes that should be performed by a project manager during the project life cycle. A project plan enables project managers to translate project requirement into work breakdown structure (WBS), task list, Gantt Charts, resource assignment, risk register and results of the nine knowledge areas of planning.

Reflecting on the historical dictum of Dwight Eisenhower which stated thus "plans are nothing, planning is everything", meaning that in achieving successful project, original plans and project goals will have to be changed to address the dynamics caused by uncertainty, during project execution. Planning is a very important part of project regarding project performance and project success, Shahzad *et al.*, [19]. Changes in plan may be introduced for different reasons. They may come from a change required by the client, from new and better ideas suggested by the project team; or even from the dictate of a new manager, who comes at a later stage and wants to impose their own twist to the project.

According to Murlidhar and Farouk [12], changes to project plan in the construction industry can be summarized as follows: Change requirements of the employer; design errors such as mistaken quantity estimates, planning mistakes, change in scope by owner, inconsistency between drawings and site conditions, citation of inadequate specifications and etc; conflicts between contracts documents, changes in material or procedures, change in design by consultant, errors and omission in design, contractors financial difficulties, change of decision making authority, special needs for project commissioning and ownership transfer, etc; the project team or sponsor discovers obstacles or possible efficiencies that require them to deviate from the original plan; and if the contractor has to add work items to the original scope of work at a later time in order to achieve the customer's demand, a fair price for the work items and fees must be added for the materials and labor.

Shehu and Akintoye as cited by Pedro [18] found in a study of program management in the construction that effective planning had the highest critically index of 0.870 of all the critical success factors (CSF) studied. Goatham [8] also argued that different people viewed project success as its affect their interest – that is project success is subjective. Shenhar *et al.*, [20] define four levels of

project success as Project efficiency, impact on the customers, business success and preparing for the future. Also, Dvir *et al.*, as cited by Pedro [18] all four-success measure (meeting planning goals, end – user benefit, contractor benefits, and overall project success) are highly inter – correlated, implying that project perceived to be successful are successful for all their stakeholders.

In the process of meeting project success criteria, changes to the original plan of a project is inevitable, hence this research studies and examines the effects of changes in project plan to the success of the project.

1.2 Statement of the Problem

The answer to project success, failure, abandonment and collapse of building construction lies in efficient project management, this is collaborated by the findings of Akande *et al.,* [1]. The amount of` changes during project implementation stands out as the only variable that distinguishes between successful and failed projects independent of their level of innovativeness, Dvir and Lechler, [7]. Inadequate management of the changes to project during it execution has led to the collapse of building facilities some even during construction, Nwachukwu and Nzota [13]. This problem have greatly affected the success of many building project, hence this research focused on the nature of the changes to project plan and its significant relationship to the success of the projects, how these changes affects the success of the project, using cited project success criteria established in the research literature review.

The researcher believes that there is a causal relationship between changes in project plan to project success and many organization and clients in the building construction industry only execute a change without considering or planning the effect of such a change in plan, therefore, this study tends to find out, and examine the nature of changes in project plan and its subsequent effect on the success of project.

1.3 Objectives of the Study

The general objective of the study investigated the analysis of changes in building construction plan on the success of a project, while the specific objectives are to:
  i.   examine the criteria for determining project success in building construction project;
  ii. evaluate the causes and effects of changes in building construction project plan during public project execution on project success in the study area and
  iii. assess possible ways by which changes in project plan can be mitigated in the study area.

1.4 Research Hypothesis

Ho: Changes in building construction project plans does not have significant effect on project success.

2. Methodology

The study area for the research was Akure Federal Constituency which comprises of Akure South Local Government and Akure North local government located in Akure metropolis, South – Western part of Nigeria. Akure city is the state capital of Ondo state with a lot of building construction projects going on, embarked upon by the Federal Government of Nigeria, the Ondo state government and Educational institutions located in the capital city, which necessitated the presence of well-established construction firms.

2.1 Population of the Study

The population under study comprised of all building construction firms in Akure metropolis and building construction professionals in the firms. From the data of construction firms in Akure, obtained from the Ondo State Government Ministry of Works, which showed that there were about thirty – five (35) construction companies in Akure. The population for this research is two hundred and ninety – three (293) building construction industry professional which are derived from the six (6) major building construction firms in Akure used by the researcher.

2.2 Sampling Technique and Sample Size

The sampling technique used for this research was the Purposive sampling technique. This technique was utilized based on the interactive session the researcher had with a top-level employee of the Ondo State Ministry of Works, in consideration of the below criteria for the construction firms:

i. The construction firm should have been established for more than five (5) years.
ii. The construction firm should have a staff strength that is more than twenty - five (25).
iii. The construction firm should have executed more than five (5) public building construction projects.
iv. The construction should have registered with Corporate Affairs Commission.
v. The construction firm should have at least one each of the following profession; Quantity surveyor, Architects, Builders, Project manager/ construction manager, Structural Engineer, Mechanical & Electrical Engineer, Quality assurance & control personnel and at least two administrative staff.
vi. The construction firm should have won a tender exercise before.

Using Yaro Yamani [22] formula:

$$n = N/ 1 + N (e)^2$$

where n = sample size

N = population of the study,   e = tolerable error (5%)

$$n = 293/ (1 + 293 * (0.05)^2, n = 293/ (1 + 293 * 0.0025) = 293/ (1 + 0.7325)$$

$$n = 293/ 1.7325, \qquad n = 169.12, n \approx 169$$

From the above calculated sample size, the researcher used the Bowley's proportional allocation formula [4] to determine the number of questionnaires that were distributed to each building construction firms.

Bowley's Proportional allocation formula;
$$N1 = n1 (n) / N$$
where,

N1 = population of each building construction firm, n = total sample size and N = population

Building construction firms	Population of the firms	Questionnaires distributed to each building construction firms
A	55	(55*169)/ 293 = 32
B	48	(48*169)/ 293 = 28
C	53	(53*169)/ 293 = 30
D	44	(44*169)/ 293 = 26
E	49	(49*169)/ 293 = 28
F	44	(44*169)/ 293 = 25
Total	**293**	**169**

2.3 Study Variables and their Measurement

The study variables for this study were socio – economic characteristics of the respondent, firms characteristics, causes and effect of changes in Project plan; ways by which changes in project plan could be mitigated; significant relationship between changes in project plan and project success. The following Likert scales will be used to measure the variables such as 1 – very low, 2 – low, 3 – moderate, 4 – high, 5 – very high.

Objective one: to examine the criteria for determining project success in building construction projects and it was measure through mean and Relative importance index
Objective two: to evaluate the causes and effects of changes in building construction project plan during public project execution on project success and it was measured through mean and Relative importance index.
Objective three: to assess possible ways by which changes in building construction project plan could be mitigated and it was measured through mean and Relative importance index.

Hypotheses:
H_1: Changes in building construction project plan does not have significant effects on project success.
Ho: Changes in building construction project plan have significant effects on project success.
Measurement: Pearson Product moment correlation coefficient.

3. Results and Discussion

From the research findings, 165 respondents returned completed questionnaire sets from a total of 169 questionnaires distributed to all six (6) major construction firms in the study area, which was 96.63% of the total questionnaires distributed. The high rate of questionnaires returned was as a result of the construction firms having a receptionist who handled such matters and the researcher's tenacity and constant monitoring of the questionnaires. The construction firms include: Shamchase Nigeria limited; Dortmund construction firm; SamGift Nigeria limited; Smace Nigeria limited; Atlor Construction Company and Mcesta Nigeria limited.

3.1 Changes in Project Plan

In ascertaining the importance of having a project plan for projects in the building sector of the construction industry, table 1 shows that 3.6% of the respondents agreed to it moderately while 9.7% of the respondents agreed that a project plan is good in the building construction industry, however, 86.7% strongly agreed with that the use of a project plan for the building construction projects is inevitable for the success of such project. In getting the views of the respondents on whether changes

do occur in project plan during the execution of the project as shown in the table 2, 5.5% moderately concurred to the occurrence of changes in project plan, 11.5% of the respondents agreed that it does occur while 83% of the respondents shows that changes in project plan occurs often during construction of building projects. Also, according to table 3, 6.7% of the respondents were undecided about the effects of changes in project plan on project success, 14.5% of the respondents believed that changes in project plan have effects on the success of the project while 78.8% of the respondents agreed strongly that changes in project plan do have effect on the success of a project.

Table 1
Changes in Project Plan Rating

Importance of Project PLAN	Frequency	Percentage
Moderate	**6**	
High	**16**	**9.7%**
Very High	**143**	**86.7%**
Total	**165**	**100%**

Table 2
Occurrence of Changes in Project Plan

Occurrence of Changes in Project Plan	Frequency	Percentage
Moderate	**9**	**5.5%**
High	19	11.5%
Very High	137	83%
Total	165	100%

Table 3
Effects of Changes in Project Plan

Effects of Changes in Project Plan	Frequency	Percentages
Moderate	**11**	**6.7**
High	24	14.5
Very High	130	78.8%
Total	165	100%

Source: Field Survey, 2016

3.2 Project Success Criteria

The table 4 presents the project success criteria identified and used in the building construction industry on public building projects. The mean score ranges from 4.82 to 4.04 and a relative importance index (RII) from 0.965 to 0.808. Satisfaction of project stakeholders was ranked as the 1st criteria of a successful project, with a mean value of (4.82 and RII of 0.965). On time delivery of project was perceived the 2nd criteria for determining project success with a mean of (4.82 and a RII of 0.965), which was also ranked side by side with satisfaction of project stakeholders. The Good reputation earned by the firm is the 3rd criteria for project success as identified by the respondents with a mean of (4.78 and a RII of 0.956). This research conforms to Shensar *et al*., [20] that for a project to be successful, assessment of project stakeholder's satisfaction is vital, for corrective actions to be taken,

in case a project is diverting from its plan. The study also agrees with Dvir and Lechler [7] who opines that to deal effectively with the management of time and activities to avoid project delay and its subsequent project failure, scheduling techniques and the timing of a project should be well mapped out in the planning phase of a project and in the project contract.

Table 4
Projects Success Criteria's

CRITERIA'S	FREQUENCY							
	VERY LOW	**LOW**	**MODERATE**	**HIGH**	**VERY HIGH**	**MEAN**	**RII**	**RANK**
Satisfaction of Project Stakeholders	0	0	5	19	141	4.82	0.965	1
On Time Delivery of Project	0	1	3	20	141	4.82	0.965	2
Good Reputation	0	0	0	36	129	4.78	0.956	3
Profitability of Parties Involved	0	0	1	45	119	4.72	0.943	4
Within Budgeted Costs	1	1	17	8	138	4.70	0.941	5
Customer Satisfaction	0	0	7	77	81	4.45	0.890	6
Quality Project	1	1	19	113	31	4.04	0.808	7

Source: Field Survey, 2016

3.3 Causes and Effects of Changes in Project Plan that Affects Project Success
3.3.1 Causes of changes in project plan

According to table of 5, change in design by consultants, was ranked 1st with a mean value of (4.76 and a RII of 0.952) and the second ranked causes of changes in project plan was change in economic condition, with a mean value of (4.76 and a RII of 0.950), while Change in Project scope by client/ owner was ranked third by the respondents, with a mean value of (4.72 and a RII of 0.944). This study corroborated the findings of Iliyas and Valentine [10] that change in design for improvement by the consultant is a norm in contemporary professional and that design changes can affect a project adversely leading to delay in project, cost overrun and abandoning of project. The study also agrees with the findings of Dickson and Mumala, [6] that insufficient scope of a project that leads to frequent changes in the project plan results in uncertainties in the work, which leads to additional work, disruptive or defective workmanship and according to this research affects the success of such projects.

3.3.2 Effects of Changes in Project Plan

The result of the research also shows that, it is evident that increase in project cost (cost overrun); abandonment of projects, delay in payment, additional payment for contractors and delay in completion schedule (time overrun) are the top five effects, which occurs as a result of changes in project plan. Table 3.3 indicates that increase in project cost was found out to be the 1st most important effects of changes in project plan ranked with a mean value of (4.98 and a RII of 0.996) and abandonment of project was ranked 2nd with a mean value of (4.96 and a RII of 0.992), while

delay in payment to both contractors and sub – contractors is rated as the 3rd effect of changes in project plan with a mean value of (4.94 and a RII of 0.988). These outcomes are in agreement with the findings by Alai *et al*., [2] which shows that changes in project plan affects total direct and indirect costs and that any major addition or alteration in the plan of a project may eventually increase its cost, even to the point of exhausting the contingency sum that is usually allocated for variation. This findings confirmed the findings of Arain and Low [3], who pointed out that when there are changes in project plan, occasionally, it leads to delay, which may cause severe problems that ends up in delay of payment to sub – contractors, because main contractors may not be able to pay the sub – contractors, unless they get paid by the owner/ sponsor or client first.

EFFECTS	VERY LOW	LOW	MODERATE	HIGE	VERY HIGH	MEAN	RII	RANK
Increase in Project plan	0	0	0	3	162	4.98	0.996	1
Abandonment of Project	0	0	0	7	158	4.96	0.992	2
Delay in payment	0	0	2	6	157	4.94	0.988	3
Additional payment for contractors	0	0	5	5	155	4.91	0.982	4
Delay in completion schedule/ time overrun	0	0	1	23	141	4.85	0.970	5
Increase in Duration (of individuals activities)	0	0	0	36	129	4.78	0.956	6
Unnecessary procurement	0	2	16	63	84	4.39	0.878	7
Increase in overhead expenses	0	1	16	79	69	4.31	0.862	8
Dispute between the parties to the client	0	0	12	122	31	4.12	0.823	9
Quality standards Enhanced	0	0	34	96	35	4.01	0.801	10
Decrease in quality	0	2	44	69	49	3.99	0.796	11
Source of corruption	0	0	27	118	20	3.96	0.792	12
Decrease in Productivity of workers	0	2	50	82	31	3.86	0.772	13

Slower project progress	0	0	78	59	28	3.70	0.739	14
Rework and demolition	0	5	80	45	35	3.67	0.733	15

Table 5
Causes and Effects of Changes in Project Plan

CAUSES	FREQUENCY							
	VERY LOW	**LOW**	**MODERATE**	**HIGH**	**VERY HIGH**	**MEAN**	**RII**	**RANK**
Change In Design By Consultants	0	0	10	20	135	4.76	0.952	1
Change In Economic Condition	0	2	5	25	133	4.75	0.950	2
Change In Scope By Client/Owner	0	0	18	10	137	4.72	0.944	3
Owners Financial Problem	0	0	18	16	131	4.68	0.937	4
Errors And Omissions In Design	0	0	5	54	106	4.61	0.922	5
Conflicts Among Contract Documents	3	7	110	30	15	4.24	0.657	7
Change In Specification By Owner	0	5	53	47	60	3.98	0.796	6

3.4 Ways to Mitigate Changes in Project Plan

Results from the research presents possible ways to mitigate changes in project plan on project success. The possible ways were ranked with a mean value of (4.98 to 3.50 and a RII from 0.989 to 0.698).

Knowledge – based of previous similar projects was ranked 1st with a mean value of (4.98 and a RII of 0.989) and involvement of professionals at initial stages of project was ranked 2nd with a mean value of (4.92 and a RII of 0.984) while having a thorough detailing of design was rated the 3rd effects of changes in project plan with a mean value of (4.87 and RII of 0.968). Tim [21] in his research collaborated these findings by stating "from the onset, project strategies and philosophies should take advantage of lessons learned from past similar project". Also Iliyas and Valentine [10] corroborated these findings that involvement of professionals in design may assist in developing better designs by accommodating their creative and practical ideas. O'Brien, [16] validated this results that thorough detailing of design would assists in identifying the errors and omissions in design at the early stage, which would not affect successful completion of the project.

3.5 Hypothesis Testing

Ho: changes in project plans does not have significant effects on project success.
P value < 0.05

In this research, the criteria for project success were estimated from all the criteria researched during literature review, which were satisfaction of project stakeholders, on time delivery of project, Good reputation, profitability of parties involved in the project, within budgeted cost, customer satisfaction, and quality project, therefore to test for the hypothesis, the extent of the effects of changes in project plan, are correlated with project success at $p < 0.05$ level of significance. From statistical calculations in table 6, the average means of project success is 4.8121 and that of the effects of changes in project plan is 4.515 with their standard deviation of 0.375 and 0.50129 respectively. From table 7, the Pearson Product moment correlation coefficient, r is -0.560 and a significance level, p of 0.03. These results shows that there is a negative correlation between project success and effects of changes in project plan, which implies that as the effects of changes in project plan increases, which is caused by frequent changes in project plan, the success of the project tends to diminishes. The table also shows that there is a statistically significant relationship between project success and effects of changes in project plan. Based on the results below, we therefore reject the null hypothesis and accept the alternatives hypotheses.

Table 6
Average Statistics of the Project Success Criteria and Effects of Changes in Project Plan

Descriptive statistics			
	MEAN	**STANDARD DEVIATION**	**N**
Project Success	4.8121	.37592	165
Effects of Changes in Project Plan	4.5152	.50129	165

Source: Field survey 2016

Table 7
Hypothesis Testing Between Project Success and Effects of Changes in Project Plan

	PROJECT SUCCESS	EFFECTS OF CHANGES IN PROJECT PLAN
Project Success		
Pearson Correlation	1.000	- .560
Sig. (2 – tailed)		.03
N	165	165
Effects of Changes in Project Plan		
Pearson Correlation		
Sig. (2 – tailed)	-.560	1.000
N	.03	
	165	165

Source: Field Survey, 2016

4. Conclusion

It is observed that the respondents valued the satisfaction of the stakeholders involved in a project, then their own profitability as satisfaction of stakeholder was ranked 1st and profitability of parties involved in a project as the 4th criteria for measuring project success. The findings showed that project consultants and project owners are major causes of changes in project plan. It was also observed that the respondents believed that any alteration in the original approved plan of a project affects firstly the cost of the projects and the data analyzed also shows that respondents having vast experience in building construction projects, have undertaken many government projects and thus have experience the bureaucracy of government procedures, which necessitated that "abandonment of project" is ranked 2nd effect, if there is frequent changes in project plan. The findings also showed that the respondents believed in learning from experience and utilization of the best brain for a

project as seen from them ranking, having knowledge – base of previous similar projects and involvement of professionals at initial stage of projects as 1st and 2nd respectively in the way to mitigate changes in project plan. The study concludes that any alteration to the changes in project plan do have effects on the success of the project, since they are public projects and some of these effects are adversary in nature, hence the need for proper and thorough planning during the initiation and planning phase of a project.

5. Recommendations

Based on the results obtained from the research and a comprehensive detailing of the research literature review, the following recommendations are given;

i. The construction industry in general and the building construction sector in particular should cultivate the habit of not only practicing effective detailing of project brief but also keeping records of them for future references;

ii. Building construction professionals should study in details previous similar projects before embarking on a new one;

iii. Project stakeholders should also provide adequate financial support to building contractors, in order for them to build according to their requirement;

iv. The building construction industry should ensure that project plan are detailed and thorough and must be clear enough in order not to give room for ambiguity in the interpretation of the plan.

Acknowledgement

References

[1] Akande, O. K., R. E. Olagunju, S. C. Aremu, and E. A. Ogundepo. "Exploring Factors Influencing of Project Management Success in Public Building Projects in Nigeria." *YBL Journal of Built Environment* 6, no. 1 (2018): 47-62.

[2] Alaryan, Alia, Ashraf Elshahat Emadelbeltagi, and Mahmoud Dawood. "Causes and effects of change orders on construction projects in Kuwait." *International Journal of Engineering Research and Applications* 4, no. 7 (2014): 1-8.

[3] Manzoor Arain, Faisal, and Low Sui Pheng. "The potential effects of variation orders on institutional building projects." *Facilities* 23, no. 11/12 (2005): 496-510.

[4] Bowley's A .L (1962). "Measurement of the precision attained in sampling", Cambridge, UK: Cambridge university press.

[5] Tanko, Bruno I., Fadhlin Abdullah, and Zuhaili Mohamad Ramly. "Stakeholders assessment of constraints to project delivery in the Nigerian construction industry." (2017).

[6] Dickson, Oloo David, M. Gerryshom, and G. Wanyona. "Variations in civil engineering construction projects in Kenya: Causes and effects." *International Journal of Engineering Research and Technology* 4 (2015): 1124-1129.

[7] Dvir, Dov, and Thomas Lechler. "Plans are nothing, changing plans is everything: the impact of changes on project success." *Research policy* 33, no. 1 (2004): 1-15.

[8] Goatham Robert (2016). "What is project success", retrieved from calleam.com/wtpf/?p=3501 I., Cleland, W. R. King, (eds.) Handbook of Project Manageme nt. Van Nostrand

[9] Babalola, I. H., Opeyemi E. Oluwatuyi, Akinloye Lawal, and E. Aiyewalehinmi. "Factors influencing the performance of construction projects in Akure, Nigeria." *International Journal of Civil Engineering, Construction and Estate Management* 3, no. 4 (2015): 57-67.

[10] Suleiman, Iliyas J., and Valentine GM Luvara. "Factors influencing change of design of building projects during construction stage in Dar-es-salaam Tanzania." *International Journal of Construction Engineering and Management* 5, no. 4 (2016): 93-101.

[11] Katarzyna Szopik Depczynaska and Giuseppe Lanfranchin. "The importance of Planning in Project management." *Theoretical approach, reports in Econonics and finance* 2, no. 1 (2016): 83 – 91.

[12] Lokhande, Murlidhar A., and Farouk Saif Yahya Ahmed. "Assessing Consequences of Change Request Impact in Construction Industry of YEMEN: An Explorative Likert-Scale Based Survey Design." *Management* 5, no. 5 (2015): 141-147.

[13] Nwachukwu, C. C., and S. M. Nzotta. "Quality Factor Indexes; A Measure To Project Success Constraints In A Developing Economy." *Interdisciplinary journal of Contemporary Research in Business (IJCRB), June editionVol* 2 (2010).

[14] Nwachukwu, C. C. "Critical Success Factors for Project Performance in Nigerian Construction Industry." *African Journal of Applied and Theoretical Economics* 8, no. 2 (2005)

[15] Nwachukwu, C. C. "The analysis of factors that constraint project Management success of public and private sector construction in Nigeria." *Owerri, Nigeria: Unpublic PhD Thesis, Federal University of Technology* (2008).

[16] O'Brien, James J. "Construction change orders: Impact, avoidance, and documentation." (1998).

[17] Oyegoke A.S, Dickinson M and Khalfan, M.M.A (2013). Construction project Procurement routes: an.in – depth critique.

[18] Serrador, Pedro. "The Impact of Planning on Project Success-A Literature Review." *The Journal of Modern Project Management* 1, no. 2 (2013).

[19] Shahzad Naeem, Benish Khanzada, Talha Mubashir and Hajra Sohail. "Impact of Project Planning on Project success with mediating role of risk management and moderating role of organizational culture." *international journal of Business and social science* 9, no. 1 (2018).

[20] Shenhar, Aaron J., Dov Dvir, Ofer Levy, and Alan C. Maltz. "Project success: a multidimensional strategic concept." *Long range planning* 34, no. 6 (2001): 699-725.

[21] Vignos, Tim. "Implementing lessons learned best practices in project management." (2014).

[22] Yamane Yaro (1964). Statistics Introductory Analysis. New York: Harper and Row Publisher.