

Influence of Conflict Management Strategies on Construction Project Performance in Nigerian Construction Industry

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ABSTRACT

For several years, reports have continued to deplore the poor state of construction performance in construction industry while many projects keep failing to exceed or live up to the expectations of clients. There is a common belief that conflict issue is one of the factors that has an influence on project performance. Therefore, this study evaluated the influence of conflict management strategies on project performance in Nigerian construction industry with specific objectives of identifying causes of conflicts in construction projects, conflict management strategies used in managing conflict issues, and influence of these strategies on construction projects performance. A quantitative research approach was adopted for the study, employing a cross-sectional survey of 336 construction professionals in client, contracting, and consulting organisations within the study area using stratified and random sampling techniques. Questionnaires were self-administered to the respondents and 301 responses were retrieved and found valid for analysis, representing a response rate of 89.6%. The data obtained were analysed using descriptive and inferential statistics. The findings indicated that unnecessary bureaucracy in payments, poor financial projection by client, unethical practices by contractors to deviate from specified materials and inadequate contract provisions for timely payments were most significant causes of conflicts in construction projects. All the strategies of conflict management were found to be significantly associated with two or more project performance outcomes. These associations were modelled using multiple regression and it can be inferred from the

models that conflicts in construction projects were managed with higher usage of smoothing/accommodating, compromising/negotiating, and avoiding/withdrawing strategies which enhance better time, client's satisfaction and H&S performance outcomes. Conflicts in construction projects managed by using more of collaborating/problem solving and smoothing/accommodating strategies have better cost, quality and H&S performance outcomes. Equally, conflicts managed with more of smoothing/accommodating and compromising/negotiating strategies have better client's satisfaction and innovation and learning performance outcomes. The study therefore recommended that project participants-in particular client and project consultants should devote more efforts and resources towards usage of conflict management strategies that have more significant association with improved project performance outcomes.

Keywords: Conflict Management, Construction, Project Performance, Strategies, Outcomes.

I. INTRODUCTION

The construction industry plays a major role in the growth and development of any nation. The sector is responsible for planning, designing, procurement, construction and delivery of buildings and civil engineering works for government and private institutions as well as individuals (Ojo, 2001). Construction industry is multidisciplinary in nature (Udeh, 2002). According to Turner (2006), construction project is a temporary undertaking which brings together various resources to achieve a

specific short-term objective. The construction industry is considered as a project-based industry in which individual project comprise unique features and also embrace various construction professional throughout the life cycle of the projects (Sylvester & Kwaji, 2017). Construction project brings together individuals or organisations that are separate and different to form a temporary multi-organisation or a temporary project coalition. The assertion is supported by Newcombe (2003) by describing a project as a coalition of powerful individuals and interest groups. Thus, it becomes necessary that construction projects are carried out to the scheduled time, to the budgeted cost, and also meet the expected quality (Saidu. & Shakantu, 2017).

Wu, Wang and Chang (2018) mentioned that there is resources exchange and knowledge transfers between different participants in construction project phases and thus, the relationship among these participants to a construction project is sometimes harsh and often escalated to conflicts (Tazelaar & Snijders, 2010). More so, Xue, Shen and Ren (2010) believed that conflicts affect collaboration among participants and performance. Conflicts usually lead to strained relationship among participants, hindering effective communication, cost and time overruns, and lowered quality and satisfaction (Yiu & Cheung, 2007; Halac, 2014). It can thus be inferred that success of construction projects depends on the way project's participants approach the problems and conflicts arising on the project. The multi-discipline involved in construction projects make conflict to be inevitable in most construction projects owing to individual possible differences in interest, concerns, training, and perception (Osuizugbo & Okuntade, 2020). Project teams' interactions affect project outcomes as the completion of construction projects involve joint efforts from various professional disciplines which makes projects prone to conflicts (Ejohwomu et al., 2016).

Previous studies on the subject of conflicts in and outside Nigeria have distinctly focused more on types/classification of conflicts (Appelbaum et al., 1999; Simmons & Peterson, 2000; Jehn & Mannix, 2001; Pierce et al., 2007; Al-Sibai & Alashwal, 2014; Alazemi et al., 2019); causes of conflicts (Thompson et al., 2000; Hall, 2002; Harmon, 2003; Cheung & Yiu, 2006; Lam et al., 2007; Ng et al., 2007; Du et al., 2011; Dada, 2012; Ejohwomu et al., 2016) and conflict management strategies (Rahim & Bonoma, 1979; Cheung & Chuah, 1999; Mcshane & Gilnow,

2000; Billikopf, 2003; Lam et al.; 2007; Lee, 2008; Lazarus, 2014; Sylvester & Kwaji, 2017; Jimoh et al.; 2019). However, very little study has been conducted in understanding conflict management strategies to project performance relationship in construction industry. Equally, much of the reported research work has come from outside the countries other than Nigeria. The practical application and influence of these conflict management strategies in resolving conflict issues to enhance better construct project performance is less focused. It is against this backdrop; this study intends to examine the influence of conflict management strategies on construction projects performance in Nigeria. The result of the study will enhance a better understanding of how conflict management strategies can be employed to resolve conflict issues and enhance better project performance. The study will also serve as a resource base to other scholars and researchers interested in carrying out further research work and all these will guide efforts to improve performance at both organisation and project levels.

II. CAUSES OF CONFLICTS IN CONSTRUCTION PROJECTS

In the construction industry, due to the differences in perceptions among the participants of the projects, conflicts are unavoidable. Khahro and Ali (2014) posited delay in payment, contractual claims and public interruption as major causes of conflicts. Awan and Saeed (2015) found out that most common causes of conflicts are lack of and sudden change in a policy. Sudhakar (2015) established that causes of conflicts include shared/common resources, differences in project goal/objective, cultural difference, values differences, personality issues, differences in technical opinions/approaches, schedules, costs, administrative procedures and different perceptions.

Sylvester and Kwaji (2017) established that possible causes of conflicts in construction industry include: poorly designed project plan process, discrepancy on task durations and sequencing project priorities, and lack of respect amongst others are possible causes of conflicts existing in building construction industries. Shawa et al.; (2018) identified major causes of conflicts as delay in payment, change of scope and specification, failure to respond in timely manner, poor communication and absence of team spirit among the participants. Molwus, Ewuga and Orih (2016) established five critical causes of conflicts to include:

poor financial projections on the client's side, lack of funds, poor public relationship between the project people and the public, change of scope of works due to client requirement instability, and cheap design hired instead of quality. Jimoh et al. (2019) indicated that among the major causes of conflict are inadequate communication among project teams, inaccurate design, information, indefinite and contradicting instructions, unassigned risks associated with the project and delayed client response (decisions). Ejohwomu et al.; (2016) posited the following as major causes of conflicts in construction projects: poor financial projections on the client's side, poor public relationship between the project people and the public, lack of funds, change of scope of works due client requirement instability, deliberate blockage of information flow and inadequate contract provisions for enforcement of timely payments amongst others.

III. CONFLICTS MANAGEMENT STRATEGIES IN CONSTRUCTION INDUSTRY

Conflict management is viewed as an approach or strategy employed towards enhancing positive outcomes and resolution amongst the project participants that are involved in matters relating to conflicts. Conflicts that are properly managed lead to better quality, better decision making, increased innovation and greater performance. (Brahnam et al.; 2005; Reade & Lee, 2016). Rahim and Bonoma (1979) and Rahim (2002) suggested five basic strategies that can be used in the management of conflicts as competing, compromising, avoiding, accommodating and collaborating. These styles are grouped as behavioral patterns of a person. Cheung and Chuah (1999) also classified conflict strategies into five major parts, namely; collaborating, compromising, smoothing, avoiding and forcing. Gawerc (2013) provided five techniques for conflict management in projects. These techniques include competing, collaborating, compromising, avoiding and accommodating. Several researchers have used these methods and called them by different terms. Howell (2014) classified management of conflict into five modes which consist of competing (assertive and uncooperative), accommodating (unassertive and cooperative), avoiding (unassertive and uncooperative), compromising (falls into the middle), and collaborating (assertive and cooperative).

Lazarus (2014) posited the following as conflict management strategies; collective bargaining, avoidance, imposing and negotiation as conflict management. Awan and Saeed (2015) posited the following as basic strategies that can influence the management of conflicts; improvement in communication, constant dialogue, accommodating, compromising, avoidance, solving the problem and re-orientation. Evidently from the extant literature, different terminologies or terms by different researchers have been used to describe conflict management strategies (Appelbaum et al., 1998; Friedman et al., 2000; Chou & Yeh, 2007; Lee, 2008; Hughes et al., 2009; Ozkalpet et al., 2009; Caputo et al., 2018; Ahad et al., 2020). For this study, collaborating/problem solving, compromising/negotiating, smoothing/accommodating, avoiding/withdrawing and forcing/asserting conflict management strategies will be employed. These forms of strategies are pioneered strategies in the field of conflict management despite the changes in working environments and yet, they are still considered important as they give a pointer to how people manage their daily life conflicts (Wilmot & Hocker, 2001).

IV. CONSTRUCTION PROJECT PERFORMANCE

Project Management Institute (PMI, 2004) described performance as the degree of achievement of certain effort or undertaking and this can be related to the prescribed goals or objectives which form the project parameters (Chitkara, 2005). Performance measurement in construction project context is described as a systematic way of judging project performance by evaluating the inputs, outputs and final project outcomes (Takimet al., 2003). A successful project is one that has been completed on schedule, within budget, within scope and satisfied the required quality (Yates & Eskander, 2002).

Cheung, Suen, and Cheung (2004) classified project performance parameters into; people, cost, time, safety and health, client satisfaction and communication. Other measures to determine project performance include; meeting budget, schedule, the quality of workmanship, stakeholder's satisfaction, transfer of technology, health and safety, and functionality (Kumaraswamy & Thorpe, 1996; Ali, 2010). Chan and Chan (2004) set out measures including objective indicators (time, cost and quality) and subjective indicators (stakeholder satisfaction,

Health, Safety and Environment) to measure construction project performance. Ozorhon, Arditi, Dikmen and Birgonul (2007) opined that project performance is usually measured using these four factors: project budget, project schedule, quality, and client satisfaction. Furthermore, Toor and Ogunlana (2010) posited project performance indicator as on time, under budget, specifications, safety, defects, stakeholders, efficiently, effectiveness and disputes. For this study, performance measures of cost, time, quality, client satisfaction, health and safety and innovation/learning will be used in evaluating the performance of construction projects in the study area. These performance measures are fundamental standards by which to measure construction project success and are used by a majority of experts and professionals in the construction industry.

V. RESEARCH METHODOLOGY

This study sought to evaluate the influence of conflict management strategies on project performance in Nigerian construction industry. This study adopted a quantitative research approach involving a cross-sectional survey method. The data used for this study were collected through a well-structured questionnaire. The designed structured questionnaire was pre-tested to ensure the appropriateness of the questions in terms of rhetoric and understanding of meanings prior to sending out the final draft to the respondents. The respondents' choices of answers ranged on a 5- point Likert scale from 'not sure' to 'most significant' for causes of conflicts and from 'never' to 'most effective' for conflict management strategies employed in construction projects. The study population were the construction professionals in client, contracting, and consulting organisations located within south-western geopolitical zone. The database of these three groups constituted the sampling frame for the study. Stratified and random sampling techniques were employed in the selection of the respondents. In order to obtain an appropriate sample size for the professionals, the total population was obtained from the list published by the various professional bodies namely; the Nigerian Institute of Quantity Surveyors (NIQS), Nigerian Institute of Architects (NIA), Nigerian Society of Engineers (NSE) and the Nigerian Institute of Building (NIOB) respectively. In selecting appropriate sample size from the lists, the Yamane (1967) formula for calculating sample size was used.

Currently the total number of registered quantity surveyors, architects, engineers and builders in the study area is 712, 623, 482 and 376 respectively. Substituting these values into the formula gives 88 quantity surveyors, 86 architects, 83 engineers and 79 builders. Stratified and Random sampling techniques were adopted for the study. The lists were stratified according to zones and years of registration of members. Random sampling method was thereafter used in selecting the respective sample size. A total number of 336 questionnaires were sent out to the respondents based on the determined sample size and a total number of 301 completely filled questionnaire were returned. This represents 89.6% of the total number of questionnaires administered. The response rate is considered adequate considering the submission of Moser and Kalton (1999) that the result of a survey would be taken as biased and of little value if the return rate were lower than 30-40%. The data collected were analysed using descriptive statistics (Percentile, Mean score, Standard deviation) and inferential statistics (Analysis of variance, Pearson's correlation, Regression analysis).

VI. RESULTS AND DISCUSSION

The data collected and analysed are presented in the following sub-sections.

6.1. Background information of the respondents

Table 1 showed the background information of the respondents. The participants' organisations are diverse, most of them are from contracting organisations which represented 40.53%, while 30.90% are from consulting organisations and 19.33% are from client organisations. The diversity in the respondents' organization would afford the issues being addressed in the survey to be viewed from different perspective of construction sector. The data showed that 20.93% of the respondents have Higher National Diploma. The highest numbers of respondents were those with Post Graduate Diploma (PGD) which represented 29.24% and respondents with Master Degree which also represented 25.91%, about 23.92% have Bachelor Degree. From the information on the academic qualifications of the respondents, it can be concluded that these respondents possessed satisfactory academic training to supply data for this study. Furthermore, apart from the encouraging educational qualification of the respondents, the analysis of the respondents' professional qualifications showed that they were all professionally qualified with 63.12% of respondents

are corporate members of their respective professional bodies, while 15.95% and 20.93% are Graduate and Fellow members of their respective professional bodies. In terms of construction experience, it is evident from Table 1 that respondents have an average of about 15.64 years' experience in the construction industry; and have also participated on average in about 14 construction projects. This gave a good indicator that the respondents have a good year of experience in construction projects. From the aforementioned information, it can therefore be concluded that the data provided by respondents can be relied upon for the purposes of analysis.

6.2 Assessment of Causes of Conflicts in Construction Projects

The analysis of assessment of the causes of conflicts in construction projects is presented in Table 2. The mean values range from the lowest value of 2.55 to the highest value of 3.63. When considering the most significant cause of conflicts, "unnecessary bureaucracy in payments" is the topmost cause of conflict in construction projects. It has the overall mean value of 3.63. Apart from unnecessary bureaucracy in payments, the next major significant cause is "poor financial projection by client" with a mean value of 3.58. This is closely followed by tied unethical practices by contractors to deviate from specified materials and inadequate contract provisions for timely payments (mean value of 3.56). The next is poor feedback (mean value of 3.47). Other causes of conflicts in construction projects considered to be significant are: cheap design hired instead of quality (3.44), inadequate time for tender documents preparation (3.43), incompetent designer (3.41), ineffective means of communication (3.36), incompetent personnel in preparation of documents (3.28), errors in bills of quantities (3.21), professional culture problems (3.17) and errors in the drawings (3.10). More so, other causes of conflicts that are considered less significant are: wrong interpretation of site investigation (2.87), cut and paste tendency (2.87), ignorance of clients on the importance of site investigation (2.79), in-experience of specification writer (2.67), language problem (2.62), change in scope of work due to changes in client's requirements (2.61) and lack of necessary building permit from regulatory authorities (2.55). From Table 2, whilst from the contracting organisation, error in bill of

quantities was ranked in the 2nd position out of the 20 causes of conflict with MS of 3.62; it was ranked 18th and 19th by client and consulting and organisations with MS of 2.85 and 3.00 respectively. Similarly, professional culture problem was rated 3rd by client organisations with MS of 3.57; whilst from the consulting and contracting organisation it was rated in 6th and 12th position with MS of 3.54 and 2.61 respectively. The ANOVA conducted on the results (at Sig. < 5%) showed difference in the opinions among the groups of respondents on ten out of the twenty causes of conflicts considered as indicated on Table 2. This may be due to the fact that the respondents come from different organisations with different roles to perform on construction projects execution which contribute to conflicts generation.

6.3. Assessment of Conflict Management Strategies Used in Construction Projects

From the review of literature, there is multiplicity and duplication of categorization/overlapping of conflict management strategies. These were further regrouped into five broad strategies groups, and these were adopted for this study (see Table 3). For the five conflict management strategies, the mean values have wide range spectrum, from the lowest value of 2.78 (forcing/asserting) to the highest value of 4.42 (collaborating/problem solving). Most of the strategies are considered effective (most of them have a mean value greater than 3.0 sets as 'effective' value in the scale used). Exception of forcing/asserting which was rated in the 5th position with MS of 2.78. From Table 3, it is interesting that the rating pattern of the items by the three groups of organisation followed same direction as all the items were ranked in the same positions accordingly. Similarly, all the groups ranked 'forcing/asserting' at low ebb with MS ranges from 2.62 to 2.94. However, as respondents from client and consulting organisations rated smoothing/accommodating and avoiding/withdrawing more effective with MS range of 3.16-3.36, contracting organisations considered these two items as less effective with MS of 2.81 and 2.68. The ANOVA conducted on the results (at Sig. < 5%) showed difference in the opinion among the groups of respondents in two items. These are: smoothing/accommodating and avoiding as their Sig. p value was less than 0.05.

Table 1. Background information of the respondents

Background Characteristics	Classifications	Frequency	Percentage
Type of Organisation	Client	86	28.57
	Consulting	93	30.90
	Contracting	122	40.53
	Total	301	100.00
Designation of Respondents	Architect	78	25.91
	Quantity Surveyor	80	26.58
	Engineer	72	23.92
	Builder	71	23.59
	Total	301	100.00
	Academic Qualifications	HND	63
BSc/B.Tech		72	23.92
PGD		88	29.24
MSc/M.Tech		78	25.91
Total		301	100.00
Professional qualification	Graduate member	48	15.95
	Corporate member	190	63.12
	Fellow member	63	20.93
	Total	301	100.00
Construction Experience in years	1-5	9	2.99
	6-10	36	11.96
	11-15	101	33.55
	16-20	97	32.23
	>20	58	19.27
	Mean	15.64	
Number of construction projects involved	1-5	14	4.65
	6-10	103	34.22
	11-20	128	42.52
	21-30	56	18.61
	Mean	14.21	

Table 2. Causes of Conflict in Construction Projects

Variable coding	Description of causes of conflicts	Clients Organisation		Consulting Organisation		Contracting Organisation		Overall rating		Standard deviation	F	Sig.
		MS	Rank	MS	Rank	MS	Rank	MS	Rank			
CCC1	Unnecessary bureaucracy in payments	3.66	1	3.61	1	3.61	3	3.63	1	1.198	0.051	0.950

CCC2	Poor financial projection by client	3.66	1	3.54	6	3.57	5	3.58	2	1.215	0.261	0.770
CCC7	Unethical practices by contractors to deviate from specified materials	3.44	9	3.56	3	3.64	1	3.56	3	1.189	0.694	0.500
CCC3	Inadequate contract provisions for timely payments	3.47	7	3.58	2	3.61	3	3.56	4	1.238	0.383	0.682
CCC4	Poor feedback	3.51	5	3.35	11	3.52	6	3.47	5	1.196	0.609	0.545
CCC6	Cheap design hired instead of quality	3.45	8	3.41	9	3.46	7	3.44	6	1.352	0.041	0.960
CCC9	Inadequate time for tender documents preparation	3.52	4	3.55	4	3.28	11	3.43	7	1.203	1.682	0.188
CCC8	Incompetent designer	3.40	10	3.55	4	3.32	10	3.41	8	1.168	1.025	0.360
CCC5	Ineffective means of communication	3.35	11	3.40	10	3.34	9	3.36	9	1.259	0.067	0.935
CCC10	Incompetent personnel in preparation of documents	3.07	15	3.27	12	3.43	8	3.28	10	1.291	1.936	0.146
CCC20	Errors in bills of quantities	2.85	18	3.00	19	3.62	2	3.21	11	1.331	10.858	0.000*
CCC16	Professional culture problems	3.57	3	3.54	6	2.61	12	3.17	12	1.348	19.798	0.000**
CCC19	Errors in the drawings	3.49	6	3.51	8	2.52	13	3.10	13	1.381	20.328	0.000**
CCC14	Wrong interpretation of site investigation	3.23	12	3.18	14	2.37	14	2.87	14	1.302	16.618	0.000**
CCC11	Cut and paste tendency	3.20	13	3.24	13	2.36	15	2.87	15	1.479	13.200	0.000**
CCC13	Ignorance of clients on the importance of site investigation	3.08	14	3.09	16	2.36	16	2.79	16	1.407	10.170	0.000**
CCC12	In-experience	2.80	19	3.15	15	2.20	17	2.67	17	1.295	16.22	0.00

	of specification writer						8		7		4	0**
CCC17	Language problem	2.88	17	3.04	17	2.11	1	2.62	1	1.360	16.31	0.00
CCC18	Change in scope of work due to changes in client's requirements	2.90	16	3.04	17	2.09	2	2.61	1	1.406	15.96	0.00
CCC15	Lack of necessary building permit from regulatory authorities	2.51	20	2.94	20	2.29	1	2.55	2	1.302	6.864	0.00
							7		0			1**

**There is a statistically significant difference of opinion between the groups.

Table 3. Conflict Management Strategies Used in Construction Projects

Variable coding	Description of conflict management strategies	Clients Organisation		Consulting Organisation		Contracting Organisation		Overall rating		Standard deviation	F	Sig.
		MS	Rank	MS	Rank	MS	Rank	MS	Rank			
CMS1	Collaborating/problem solving	4.58	1	4.44	1	4.30	1	4.42	1	0.851	2.923	0.055
CMS2	Compromising/Negotiating	3.64	2	3.69	2	3.40	2	3.56	2	1.020	2.489	0.085
CMS3	Smoothing/Accommodating	3.36	3	3.16	3	2.81	3	3.08	3	1.256	5.272	0.006**
CMS4	Avoiding/Withdrawing	3.31	4	3.27	4	2.68	4	3.04	4	1.302	8.390	0.000**
CMS5	Forcing/Asserting	2.84	5	2.94	5	2.62	5	2.78	5	1.210	1.902	0.151

**There is a statistically significant difference of opinion between the groups.

6.4. Association between conflict management and construction performance

Table 4.1-4.6 showed the regression analysis of the conflict management constructs and construction performance measures.

6.4.1 Conflict Management and Time Performance Outcome

In the Model A as showed in Table 4, R² generated for the model is 0.185, implying that compromising/negotiating, smoothing/accommodating, avoiding/withdrawing and forcing/asserting conflict management strategies account for 18.5% of

the variation in the time performance. It was observed that 21.2% of the variation in time performance is explained by smoothing/accommodating while compromising/negotiating accounts for 16.0%. Others

are avoiding/withdrawing accounts for 14.8% of the variation in the time performance and forcing/asserting accounts for 13.3%.

Table 4. Result of Regression Analysis for Time Performance (Model A)

Regression	R-Square	Adjusted R Square	F-value	Sig.
		0.185	0.171	13.362
	Coefficient β	t	Sig.	
Constant	2.277	7.194	.000	
Collaborating/Problem solving	.025	.346	.730	
Compromising/Negotiating	.160	2.562	.011	
Smoothing/Accommodating	.212	3.912	.000	
Avoiding/Withdrawing	.148	2.863	.004	
Forcing/Asserting	-.133	-2.551	.011	

The ANOVA which tests whether or not the model is a useful predictor of Time Performance, gives a highly significant result ($F = 13.362$, $p = .000$), indicating that this model significantly improves the prediction of time performance outcomes.

It can thus be inferred that compromising/negotiating, smoothing/accommodating, avoiding/withdrawing and forcing/asserting can be used to resolve conflicts where time is of essence in construction project. The only one variable eliminated through the regression was collaborating/problem solving strategy.

6.4.2 Conflict Management and Cost Performance Outcome

Under the selection criteria, two predictors were selected for inclusion in the model B. The value of R^2 for the model generated is .228, it implies that collaborating/problem solving and smoothing/accommodating conflict management strategies account for 22.8% of the variation in the cost performance. Smoothing/accommodating alone accounts for 26.4% of the variation in cost performance outcome while collaborating/problem solving accounts for 18.5%.

Table 5. Result of Regression Analysis for Cost Performance (Model B)

Regression	R-Square	Adjusted R Square	F-value	Sig.
		0.228	0.215	17.428
	Coefficient β	t	Sig.	
Constant	1.866	6.673	.000	
Collaborating/Problem solving	.183	2.859	.005	
Compromising/Negotiating	.031	.563	.574	
Smoothing/Accommodating	.264	5.522	.000	
Avoiding/Withdrawing	.059	1.285	.200	
Forcing/Asserting	-.031	-.679	.498	

The ANOVA which tests whether or not the model is a useful predictor of Cost Performance, gives a highly significant result ($F = 17.428$, $p =$

.000), indicating that this model significantly improves the prediction of cost performance outcomes.

Thus, smoothing/accommodating and collaborating/problem solving are conflict management strategies used to resolve conflicts when significant cost performance of construction project is expected by ensuring the budget for the project is not exceeded as a result of conflict occurrence. The three other variables eliminated through the regression were compromising/negotiating, avoiding/withdrawing and forcing/asserting.

6.4.3 Conflict Management and Quality Performance Outcome

Under the selection criteria, three predictors were selected for inclusion in the model C. The value

of R^2 for the model obtained is .239, implying that collaborating/problem solving, smoothing/accommodating and avoiding/withdrawing conflict management strategies account for 23.9% of the variation in the quality performance. Collaborating/problem solving alone accounts for 34.6% of the variation in quality performance outcome while smoothing/accommodating accounts for 28.0%. Avoiding/withdrawing accounts for 14.2% of the variation in the quality outcomes.

Table 6.Result of Regression Analysis for Quality Performance (Model C)

Regression	R-Square	Adjusted R Square	F-value	Sig.
		0.239	0.226	18.549
	Coefficient β	t	Sig.	
Constant	1.127	3.678	.000	
Collaborating/Problem solving	.346	4.925	.000	
Compromising/Negotiating	.057	.937	.349	
Smoothing/Accommodating	.280	5.340	.000	
Avoiding/Withdrawing	-.142	-2.823	.005	
Forcing/Asserting	.051	1.016	.310	

The ANOVA which tests whether or not the model is a useful predictor of quality performance, gives a highly significant result ($F = 18.549$, $p = .000$), indicating that this model significantly improves the prediction of quality performance outcomes. It can be inferred that collaborating/problem solving, smoothing/accommodating and avoiding/withdrawing are conflict management strategies used to settle conflicts when quality of construction project is targeted through lowered level of conflicts occurrence. The two other variables eliminated through the regression were compromising/negotiating and forcing/asserting.

6.4.4. Conflict Management and Client's Satisfaction Performance Outcome

In the Model D as showed in Table 7, R^2 generated for the model is 0.222, implying that compromising/negotiating, smoothing/accommodating, and avoiding/withdrawing conflict management strategies account for 22.2% of the variation in the client's satisfaction performance outcome. It was indicated that smoothing/accommodating alone account for 21.4% of the variation in client's satisfaction performance. Others are compromising/negotiating which accounts for 18.2% of the variation in client's satisfaction performance while avoiding/withdrawing accounts for 12.9%.

Table 7.Result of Regression Analysis for Client's Satisfaction Performance (Model D)

Regression	R-Square	Adjusted R Square	F-value	Sig.
		0.222	0.209	16.864
	Coefficient β	t	Sig.	
Constant	1.448	4.418	.000	
Collaborating/Problem solving	.146	1.942	.053	
Compromising/Negotiating	.182	2.806	.005	

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Smoothing/Accommodating	.214	3.814	.000	
Avoiding/Withdrawing	.129	2.397	.017	
Forcing/Asserting	-.065	-1.193	.234	

The ANOVA which tests whether or not the model is a useful predictor of client’s satisfaction performance, gives a highly significant result ($F = 16.864$, $p = .000$), indicating that this model significantly improves the prediction of client’s satisfaction performance outcomes. It can thus be inferred that smoothing/accommodating, compromising/negotiating, and avoiding/withdrawing can be used to resolve conflicts where client’s satisfaction is a priority, as settlement of conflicts will enable clients get value for money spent on construction projects. The two variables eliminated

through the regression were collaborating/ problem solving strategy and forcing/asserting strategy.

6.4.5 Conflict Management and Health and Safety (H&S) Performance Outcome

Under the selection criteria, four predictors were selected for inclusion in the model E. From the model as indicated in Table 4.8, R^2 generated for the model is 0.450. The predictors are, collaborating/problem solving, compromising/negotiating, smoothing/accommodating, and avoiding/withdrawing conflict management strategies, all of which together account for 45.0% of the variation in the H&S performance.

Table 8.Result of Regression Analysis for Health and Safety (H&S) Performance (Model E)

Regression	R-Square	Adjusted R Square	F-value	Sig.
		0.450	0.441	48.248
	Coefficient β	t	Sig.	
Constant	-1.108	-3.330	.001	
Collaborating/Problem solving	.379	4.967	.000	
Compromising/Negotiating	.301	4.565	.000	
Smoothing/Accommodating	.250	4.387	.000	
Avoiding/Withdrawing	.188	3.451	.001	
Forcing/Asserting	.078	1.417	.158	

It was observed that 37.9% of the variation in H&S performance is explained by collaborating/problem solving while compromising/negotiating accounts for 30.1%. Others are smoothing/accommodating which accounts for 25.0% and avoiding/withdrawing account for 18.8% of the variation in the H&S performance.

ating, and avoiding/withdrawing conflict management strategies can be used to resolve conflicts where health and safety needed to be improved in construction project. The only one variable eliminated through the regression was forcing/asserting strategy.

The ANOVA which tests whether or not the model is a useful predictor of H&S performance, gives a highly significant result ($F = 48.248$, $p = .000$), indicating that this model significantly improves the prediction of H&S performance outcomes.

6.4.6 Conflict Management and Innovation and Learning Performance Outcome

It can thus be inferred that collaborating/problem solving, compromising/negotiating, smoothing/accommodating, and forcing/asserting conflict management

strategies account for 10.2% of the variation in the innovation and learning performance. It was observed

that 18.0% of the variation in innovation and learning performance is explained by compromising/negotiating while

smoothing/accommodating accounts for 13.9%. Other is forcing/asserting which accounts for 10.8%.

Table 9. Result of Regression Analysis for Innovation and Learning Performance (Model F)

	R-Square	Adjusted R Square	F-value	Sig.
Regression	0.102	0.087	6.700	0.000
	Coefficient β	t	Sig.	
Constant	2.829	9.293	.000	
Collaborating/Problem solving	-.021	-.301	.764	
Compromising/Negotiating	.180	2.993	.003	
Smoothing/Accommodating	.139	2.674	.008	
Avoiding/Withdrawing	.058	1.162	.246	
Forcing/Asserting	-.108	-2.154	.032	

The ANOVA which tests whether or not the model is a useful predictor of innovation and learning performance, gives a significant result ($F = 6.700, p = .000$), indicating that this model significantly improves the prediction of innovation and learning performance outcomes. It can thus be inferred that compromising/negotiating, smoothing/accommodating, and forcing/asserting can be used to resolve conflicts where innovation and learning are to be achieved in construction projects. The two variables eliminated through the regression were collaborating/problem solving and avoiding/withdrawing strategies.

VII. DISCUSSION

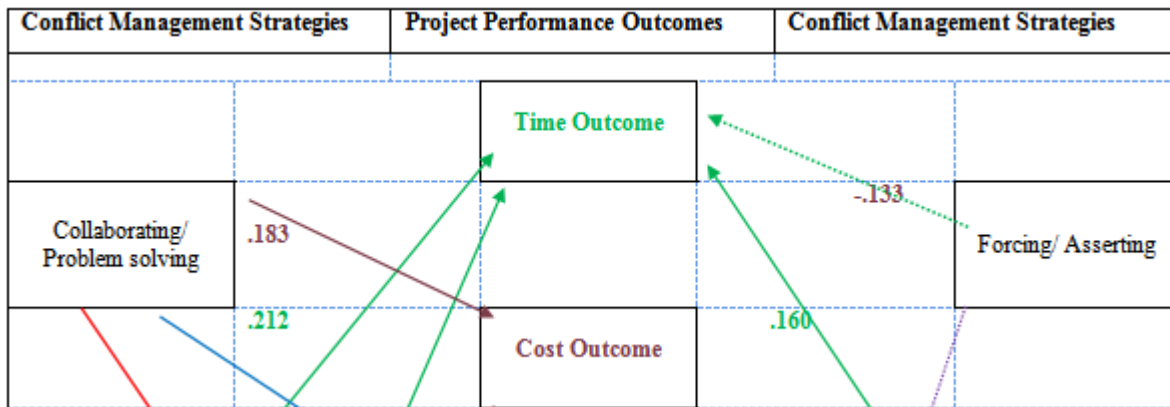
This study was carried out to evaluate the influence of conflict management strategies on construction project performance in Nigerian construction industry. Findings on the causes of conflicts in construction projects in the study area showed that unnecessary bureaucracy in payments, poor financial projection by client, unethical practices by contractors to deviate from specified materials and inadequate contract provisions for timely payments were identified as the most significant causes of conflicts in construction projects. The results are similar to the results of Khahro and Ali (2014); Shawa et al., (2018); Molwus et al., (2016); and Ejohwomu et al., (2016) where these factors were highly rated to be significant causes of conflicts in construction projects.

The study showed that collaborating/problem solving is the most effective strategy used for managing conflicts in construction projects. This result suggests that whenever there is conflict between or among project participants, conflicting parties come together face to face and tries to resolve their disagreements by emphasising more on solving the problem instead of creating unnecessary argument. Caputo et al., (2018) elucidated that this style is observed when both parties seek a solution to a conflict by considering the interests of all parties. Collaborating conflict management strategy emphasizes a high concern for your own interests as well as high concern for the interests of the other party (Chou and Yeh, 2007). Compromising/negotiating is another highly rated effective conflict management strategy in use. This implies that the conflicting parties principally bargain for solutions with a give and take attitude in order to achieve project goals and certain level of satisfaction. This is supported by Rahim (2002) that compromising as give and take style will leave conflicting parties to accept some degrees of satisfaction. The finding is consistent with the findings of Appelbaum et al., (1998) in relation to North America and Ozkalpet al., (2009) in relation to Turkey as they select compromising as their key conflict management strategies. Conflict management strategies such as smoothing/accommodating and avoiding/withdrawing were also considered effective strategies commonly use to manage conflicts in construction projects. The result agrees with Lee

(2008) that Malaysian construction sector prefers obliging/accommodating as a combined conflict management technique with either compromising or integrating. Accommodating strategy lowers down the stress and tension resulting from the conflict (Ahad et al., 2020). Avoiding conflict management strategy is fourth and used when the issues are trivial, potential disruption outweighs the benefits of resolution, maintaining good reputation and cooling off period is needed for aggrieved parties as posited by (Hughes et al., 2009; Caputo et al., 2018; Ahad et al., 2020). The findings of this study partially agreed with Friedman et al. (2000) who posited that avoiding strategy is suitable when parties lack knowledge regarding the conflict.

More so, the findings from the multiple regression analysis showed that all the five conflict management strategies (collaborating/problem solving, compromising/negotiating, smoothing/accommodating, avoiding/withdrawing and forcing/asserting) have significant contribution to two or more of the six construction project performance measures (time, cost, quality, client's satisfaction, health and safety, and innovation/learning). This establishes the fact that all the conflict management strategies are essential, as the experience and knowledge of the project participants and the issues at stake determine which particular

conflict management strategies is most appropriate to use in a project life cycle (see figure 1). These relationships are though associated with relatively small coefficient of determination (R^2) values ranging from approximately 10% to 45%. Although these relationships were found to be associated with relatively small R^2 values ranging from 10% to 45%, it is argued that these are significant enough to warrant attention from practitioners and performance researchers alike. Certainly, this outcome has gone some length to substantiate other studies undertaken on project performance which have pointed to other factors impacting on performance (Chanet al., 2004; Belout & Gauvreau, 2004; Ankrah, 2007; Al-Zahrani, 2013). It is also imperative to underscore that the low R^2 values do not in any way lessen the significance of the relationships as depicted on the models. Whereas the predictive power of these models is limited by the fact that the conflict management strategies account for a relatively small proportion of the variability in performance outcomes (10% - 45%), these models still depict significant relationships which are real and not just due to chance. Models with similar R^2 values are existing in the previous researches (Omorieg, 2006; Ankrah, 2007). Omorieg (2006) for instance reported R^2 values ranging from 4% to 26% and Ankrah (2007) reported R^2 values ranging from 12% to 23%.



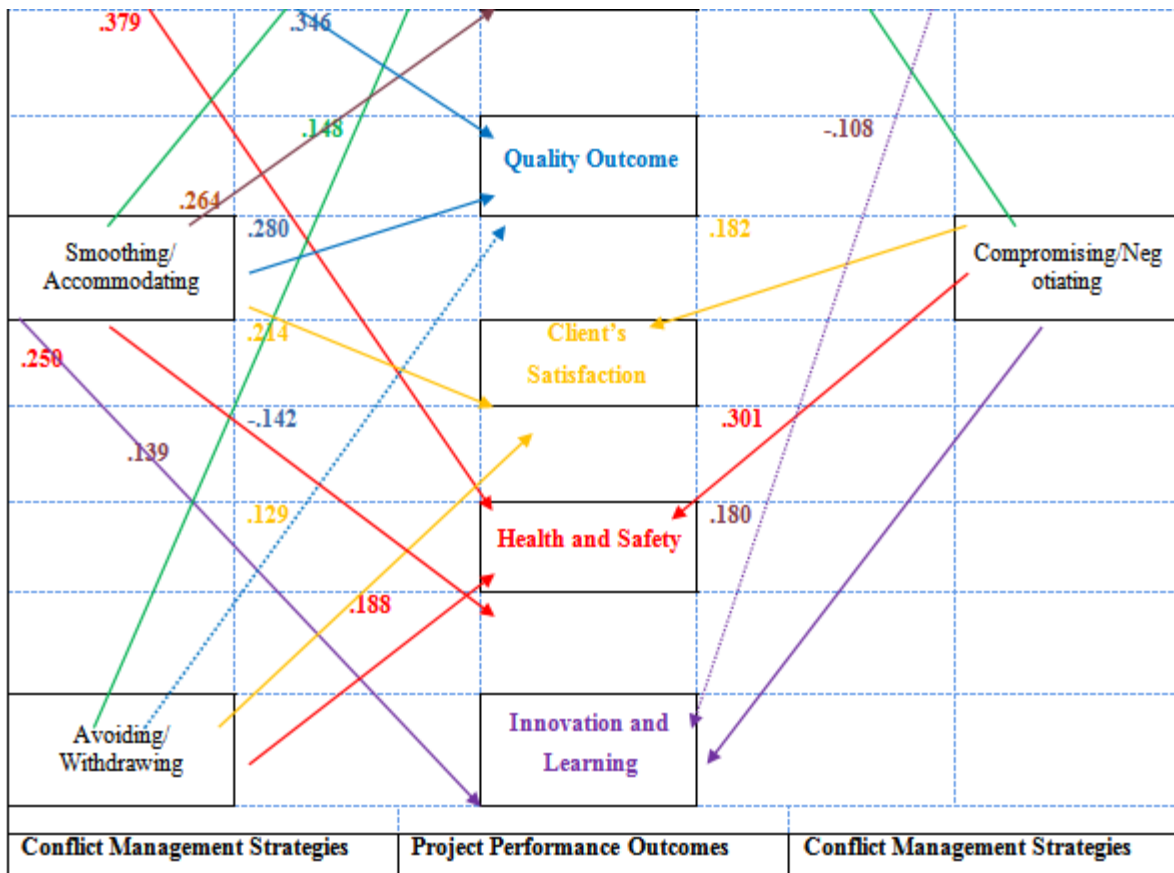


Figure 1: A pictorial representation of the regression results

VIII. CONCLUSION, IMPLICATION AND RECOMMENDATION

The study was carried out to evaluate the influence of conflict management strategies on construction project performance in Nigerian construction industry. The research findings revealed that conflicts in construction projects are inevitable and most causes of these conflicts' situations are related to financial issues of the parties, unprofessional behaviour of the parties, poor information, poor documentation, and negligence. Nevertheless, all the identified causes of conflicts in construction projects were found to be above average in term of their significance. The findings on the strategies used to manage conflicts in construction projects shows that all the identified conflict management strategies are commonly used to manage conflict issues that ensued in construction projects. However, forcing/asserting strategy was rated at lower ebb and this is even quite above average. In terms of the influence of conflict

management strategies on construction project performance, it is evident from the study that, whilst not all the strategies of conflict management assessed are significant in terms of their association with the performance measures, and not all the measures of performance show an association with those significant strategies of conflict management, there is significant evidence and support for the position that smoothing/accommodating, compromising/negotiating, and collaborating/problem solving strategies have more impacts on some project performance outcomes. The findings of this study have both practical and theoretical implications for the project stakeholders. First, the result of the study will provide the project stakeholders necessary information on how conflict management strategies can be employed to resolve conflict issues and enhance better project performance. Second, the study will extend the body of knowledge on the concept of conflict management and project performance in Nigeria. The study, therefore, recommends that there is a need for realistic budget and

financial projection of the project to be able to know the financial commitment before the commencement of a project. This can reduce problems associated with lack of funds and payment issues for the project. There is also a need for contracts of engagements to be clear, explicit and specific on the responsibilities of each party in a contract and should spell out consequential remedies for failure to perform. This will lessen conflicts in relation to unprofessional behaviour, negligence, delays in payments and communication breakdown.

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REFERENCES

- [1]. Ahad, A., Ali, A. & Iqbal, S. (2020). Impact of Conflict on Project Performance in Public and Private Sector Organizations of Pakistan. *International Journal of Scientific & Engineering Research*, 11(2), 784-796.
- [2]. Alazemi, M.K.E., Mohiuddin, A.K.M. & Al-Juboori, S.A. (2019). Conflict Management of Construction Projects—A Case Study: Kuwait International Airport Cargo City. *International Journal of Mechanical Engineering*, 8, 45-54.
- [3]. Ali, A. S. (2010). The performance measurement of construction projects managed by ISO- certified contractors in Malaysia. *Journal of Retail and Leisure Property*, 9(1), 25-35.
- [4]. Al-Sibai, E.Z. & Alashwal, A.M. (2014). A Perspective on Conflict and Performance of International Construction Projects. *Journal of Surveying, Construction and Property (JSCP)*, 5 (2), 21 - 12.
- [5]. Al-Zahrani, J. I. (2013). The Impact of Contractors' Attributes on Construction Project Success. PhD thesis, Faculty of Engineering and Physical Sciences, The University of Manchester.
- [6]. Ankrah, N. A. (2007). An Investigation into the impact of culture in construction project performance, PhD thesis, University of Wolverhampton.
- [7]. Appelbaum, S.H., Abdallah, C. & Shapiro, B.T. (1999). The self-directed team: A Conflict resolution analysis. *Team Performance Management*, 5(2), 60-77.
- [8]. Appelbaum, S.H., Shapiro, B., & Elbaz, D. (1998). The management of multicultural group conflict. *Team Performance Management*, 4(5), 211-234.
- [9]. Awan, A.G. & Saeed, S. (2015). Conflict Management and Organizational Performance: A Case Study of Askari Bank Ltd. *Research Journal of Finance and Accounting*, 6 (11), 88 - 102.
- [10]. Belout, A. & Gauvreau, C. (2004). Factors influencing project success: the impact of human resource management, *International Journal of Project Management*, 22, 1-11.
- [11]. Billikopf, G. (2003). Conflict management skills. *Labor Management in Agriculture: Cultivating Personnel Productivity*, The Regents of the University of California, 157-174.
- [12]. Brahnam, S.D., Margavio, T.M., Hignite, M.A., Barrier, T.B. & Chin, J.M. (2005). A gender-based categorization of conflict resolution. *Journal of Management Development*, 24(3), 197-208.
- [13]. Caputo, A., Marzi, G., Pellegrini, M., & Rialti, R. (2018). Conflict management in family businesses: A bibliometric analysis and systematic literature review. *International Journal of Conflict Management*, 29(4), 519-542.
- [14]. Chan, A. P. & Chan, A. P. (2004). Key Performance Indicators for Measuring Construction Success. *Benchmarking: An International Journal*, 11(2), 203-221.
- [15]. Chan, A. P. C., Scott, D. & Chan, A. P. L. (2004). Factors Affecting the Success of a Construction Project, *Journal of Construction Engineering and Management*, 130(1), 153-155.
- [16]. Cheung, C. C. & Chuah, K.B. (1999). Conflict management styles in Hong Kong industries. *International Journal of Project Management* 17 (6), 393-399.
- [17]. Cheung, S. O., Suen, H. C. & Cheung, K. K. (2004). PPMS: A Web-based construction Project Performance Monitoring System. *Automation in Construction*, 13(3), 361-376.
- [18]. Cheung, S. O. & Yiu, T. W. (2006). Are construction disputes inevitable? *IEEE*

- Transactions on Engineering Management, 53 (3), 456 - 470.
- [19]. Chitkara, W. (2005). On the Development of Project Management Research: Schools of Thought and Critique. *International Project Management Journal*, 8, 20-31.
- [20]. Chou, H.W. & Yeh, Y.J. (2007). Conflict, conflict management and Performance in ERP teams. *Social Behavior and Personality*, 35(8), 1035-1048.
- [21]. Dada, M.O. (2012). Analysis of conflict centers in projects procured with traditional and integrated methods in Nigeria. *Journal of Engineering, Project and Production Management*, 2(2), 66-77.
- [22]. Du, R., Ai, S. & Brugh, C.M. (2011). Integrating Taoist Yin-Yang thinking with Western nomology: A moderating model of trust in conflict management. *Chinese Management Studies*, 5(1): 55-67.
- [23]. Ejohwomu, O. A., Oshodi, O. S. & Onifade, M. K. (2016). Causes of Conflicts in Construction Projects in Nigeria: Consultant's and Contractor's Perspective. *Nigerian Journal of Technology (NIJOTECH)*, 35, (2), 270 - 277.
- [24]. Friedman, R.A., Tidd, S.T., Currall, S.C. & Tsai, J.C. (2000). What goes around comes around: The impact of personal conflict style on work conflict and stress. *The International Journal of Conflict Management*, 11(1), 32-55.
- [25]. Gawerc, M. (2013). Research Note: Integrative Ties as an Approach to Managing Organizational Conflict." *Conflict Resolution Quarterly*, 31(2), 219-225.
- [26]. Hall, J. (2002). Ineffective communication: Common causes of construction disputes. *Alliance's Advisory Council Legal Notes*, 13(2).
- [27]. Harmon, K.M.J. (2003). Conflict Between Owner and Contractors: Proposed Intervention Process. *Journal of Management in Engineering*, 19, 121- 125.
- [28]. Howell, S.E. (2014). Conflict Management: A Literature Review and Study. *Journal of radiology management*, 14-22.
- [29]. Hughes, R. Ginnett, R. & Curphy, G. (2009). *Leadership: Enhancing the Lessons of Experience*. 6th edn. New York: McGraw Hill.
- [30]. Jehn, K. A. & Mannix, E. A. (2001). The dynamic nature of conflict. A longitudinal study of intragroup conflict and group performance. *Academy of management journal*, 44(2), 238-239.
- [31]. Jimoh, R., Oyewobi, L., Osajarikre, J., Adaji, A. & Sani, M. (2019). Strategies for Managing Conflicts on Construction Sites in Abuja-Nigeria. *Journal of Techno Social*, 11(2), 55-64.
- [32]. Khahro, S. H. & Ali, T. H. (2014). Causes leading to conflicts in construction project: A viewpoint of Pakistani Construction Industry. *International Conference on challenges in IT, Engineering and Technology (ICCIET)*, 17-18 July 2014, Phuket (Thailand), 116-121.
- [33]. Kumaraswamy, M. & Thorpe, A. (1996). Systematizing construction project evaluation. *Journal of Management and Engineering*, 12(1), 34-39.
- [34]. Lam, P.K., Chin, K.S. & Pun, K.F. (2007). Managing conflict in collaborative new product development: a supplier perspective. *International Journal of Quality and Reliability Management*, 24(9): 891-907.
- [35]. Lazarus, U.K. (2014). Conflict Management Strategies and Employees' Productivity in a Nigerian State Civil Service. *Journal of Business and Management Sciences*, 2 (4), 90-93.
- [36]. Lee, K. L. (2008). An examination between the Relationships of conflict management styles an employee's satisfaction. *International Journal of Business and Management*, 3(9), 11-25.
- [37]. McShane, S.L. and Glinow, M.A. (2000). *Organizational Behavior*. McGraw-Hill, Boston.
- [38]. Molwus, J. J., Ewuga, D. J. & Orih, E. (2016). Managing Conflict in The Nigerian Construction Industry: A Study of Jos in North-central Nigeria. *ATBU Journal of Environmental Technology*, 9(1), 19-29.
- [39]. Moser, C.A. & Kalton, G. (1999). *Survey Methods in Social Investigation*, 2nd Edition. Aldershot: Gower Publishing Company Ltd.
- [40]. Newcombe, R. (2003). From client to project stakeholders: a stakeholder mapping approach, *Construction Management and Economics*, 21, 841- 848.
- [41]. Ng, H.S., Peña-Mora, F. & Tamaki, T. (2007). Dynamic conflict management in large-scale design and construction projects. *Journal of Management in Engineering*, 23(2): 52- 66.

- [42]. Ojo, G.K, (2001). A study of the relationship between contract period and tender sum of construction projects in southwestern Nigeria, unpublished MSc thesis, Obafemi Awolowo University, Ile-Ife.
- [43]. Omoregie, A. (2006). Blueprints for infrastructure and service delivery in Sub-Saharan Africa, PhD thesis, The Leicester School of Architecture, De Montfort University, Leicester.
- [44]. Osuizugbo, I.C. & Okuntade, T.F. (2020). Conflict Management Practice among Stakeholders in Construction Project Delivery. *Covenant Journal in Research & Built Environment (CJRBE)*, 8(1), 40-57.
- [45]. Ozkalp, E., Sungur, Z. & Ozdemir, A.A. (2009). Conflict management styles of Turkish managers. *Journal of European Industrial Training*, 33(5), 419-438.
- [46]. Ozorhon, B., Ardit, D., Dikmen, I. & Birgonul, M. T. (2007). Effect of host country and project conditions in international construction joint ventures. *International Journal of Project Management*, 25(8), 799-806.
- [47]. Pierce, J.L., Gardner, D.G. & Dunham, R.B. (2007). *Management and Organizational Behavior: An Integrated Approach*. Second Indian Reprint. South-Western, Thomson Learning, Inc., USA.
- [48]. Project Management Institute (PMI, 2004). *A Guide to the Project Management Body of Knowledge*, 3rd Ed, Global Standard, Four Campus Boulevard, Newtown Square, PA 19073-3299, USA.
- [49]. Rahim, M. A. (2002). Toward a Theory of Managing Organizational Conflict. *The International Journal of Conflict Management*, 206-235.
- [50]. Rahim, A. & Bonoma, T. V. (1979). Managing organizational conflict: A model for diagnosis and intervention. *Psychological Reports*, 44, 1323-1344.
- [51]. Reade, C. & Lee, H. J. (2016). Does Ethnic Conflict Impede or Enable Employee Innovation Behavior?: The Alchemic Role of Collaborative Conflict Management. *International Journal of Conflict Management*, 27(2), 199-224.
- [52]. Saidu, I. & Shakantu, W. (2017). An investigation into cost overruns for ongoing building projects in Abuja, Nigeria. *Acta Structilia*, 24(1), 53-72.
- [53]. Shawa, B. J., Lello, D. S. & Ntiyakunze, S. K. (2018). Analysis of Causes of Conflicts within the Design Teams in Building Projects in Tanzania. *International Journal of Engineering Trends and Technology (IJETT)*, 60(1), 1-20.
- [54]. Simmons, T.L. & Peterson, R.S. (2000). Task Conflict and Relationship Conflict in Top Management Teams: The Pivotal Role of Intra group Trust, *Journal of Applied Psychology*, 85(1), 102 – 111.
- [55]. Sudhakar, G. P. (2015). A Review of Conflict Management Techniques in Projects. *Brazilian Journal of Operations and Production Management*, 12, 214-232.
- [56]. Sylvester, S.I. & Kwaji, M. (2017). Conflict Management in Building Construction Industries: Case Study of Adamawa State. *CARD International Journal of Environmental Studies and Safety Research (IJESSR)*, 2 (3), 58-68.
- [57]. Takim, R., Akintoye, A. & Kelly, J. (2003). Performance measurement systems in construction, In: Greenwood, D. (Ed.) 19th Annual ARCOM conference, 1, ARCOM, University of Brighton, 423-431.
- [58]. Tazelaar, F. & Snijders, C. (2010). Dispute resolution and litigation in the construction industry. Evidence on conflicts and conflict resolution in The Netherlands and Germany. *Journal of Purchasing and Supply Management*, 16 (4), 221-229.
- [59]. Thompson, R. M., Vorster, M. C. & Groton, J. P. (2000). Innovations to manage disputes: DRB and NEC. *Journal of Management in Engineering*, 16(5), 51-59.
- [60]. Toor, S.R. & Ogunlana, S.O. (2010). Beyond the 'iron triangle': stakeholder perception of key performance indicators (KPIs) for large-scale public-sector development projects. *International Journal of Project Management*, 28, 228-236.
- [61]. Turner, R. J. (2006). Towards a theory of project management: The nature of the project, *International Journal of Project Management*, 24(1), 1-11.
- [62]. Wilmot, W. & Hocker, J. (2001). *Interpersonal conflict*. Boston: McGraw-Hill.
- [63]. Wu, G., Wang, H. & Chang, R. (2018). A Decision Model Assessing the Owner and Contractor's Conflict Behaviors in

- Construction Projects. Hindawi Advances in Civil Engineering, 2018, Article ID 1347914, 1-11.
- [64]. Xue, X., Shen, Q. & Ren, Z. (2010). Critical review of collaborative working in construction projects: business environment and human behaviors,” Journal of Management in Engineering, 26(4), 196–208.
- [65]. Yates, J. & Eskander, A. (2002). Construction Total Project Management Planning Issues. International Journal of Project Management, 33, 37-48.
- [66]. Yamane, T. (1967). Statistics; An introductory Analysis, 2nd Ed, New York: Harper and Row.
- [67]. Yiu, K. T. W. & Cheung, S. O. (2006). A catastrophe model of construction conflict behaviour. Building and environment, 41, 438-447.