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Influence of Conflict Factors on Performance of Construction Projects

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Abstract
Conflict is inherent in construction projects due to uniqueness, complexity and involvement of several stakeholders. Occurrence of conflicts affects projects outcomes if not properly managed. This study assessed the influence of factors responsible for conflicts on time, cost and quality performance of construction projects. A quantitative approach which entails questionnaire survey was adopted. Data were collected through questionnaire administered to 125 construction professionals, out of which. 83 were properly filled and returned. The data collected was analysed using both descriptive and inferential statistics. Influence of the conflict factors on project performance parameters was ranked using mean and standard deviation. Kruskal-Wallis Test was used to determine the statistical significance of the variation in influence of the conflict factors on time, cost and quality performance of construction projects. Results indicated that the influence of all the 21 assessed conflict factors ranges from 'moderate' to 'high'. 15, 13 and 13 factors have high influence on time, cost and quality performance respectively. Findings of the study also indicated that the variation in the influence of conflict factors on time, cost and quality performance of construction project was statistically not significant (p value obtained is 0.286 for P≤ 0.05). The study concludes that 13 conflict factors have high influence across time, cost and quality performance of construction projects. Furthermore, the influence of conflict factors on time, cost and quality performance of construction projects is similar. The study recommends that construction stakeholders should strive to minimise the occurrence of factors which give rise to conflict in any given project so as to achieve optimal project performance.

Keywords: Conflict factors, Construction project performance, Cost, Time, Quality.

Introduction
Construction projects involve several actors. These actors can be classified as internal (e.g. consultant, client and contractor) or external (stakeholders who do not partake in the construction process such as users). Research has shown that, conflict is inherent in construction projects and are more when compared with projects in other industries because of the multiple stakeholders involved (Zhi, 1995). However, it must be noted that several factors could results into conflicts (Achariya *et al*, 2006).

Conflict is described as any divergence of interests, objectives or priorities between individuals, groups, or organisations; or non-conformance to requirement of a task, activity or process (Gardiner and Simmons, 1992). A generally accepted definition of conflict is lacking. However, a common definition that emerges from the definitions found in literature shows that conflicts is any disagreements which arise amongst individual due to non-convergence of ideas, interest and concerns.

There is a general consensus that conflicts yield dysfunctional project outcomes. Empirically, it has been shown that project actors have great impact on project performance. Hence, a breakdown of relationship amongst project actors leads to poor performance (Meng, 2012). The evident implications were low productivity, low morale, distrust, communication problems, requirement instability, rework and disputes, which could in turn affect the time, cost and quality performance of projects (Love and Edwards, 2004; Liu, *et al.*, 2011).

Moreso, conflict is synonymous with construction tasks and giving the impressions of issues of increase in project cost, project delays; reduce productivity, loss of benefit or harm in business connections (Awakul and Ogunlana, 2002). Carsten (2005); Dada (2013) asserted that, conflict could influence the performance of construction projects. Furthermore, evidence suggests conflicts must be managed (i.e. keeping conflicts within allowable limits) so as to optimize project performance (Awakul and Ogunlana, 2002). Based on the foregoing, it is evident that conflicts and its management are essential components for improving project performance and outcome. Awakul and Ogunlana, (2002), emphasised the need to identify causes of conflicts, as this will improve conflict avoidance and resolution, and ultimately lead to improved project performance. However, Dreu *et al.* (2001) also noted that, conflicts can lead to functional project outcomes (in terms of improved decision making, trust, team creativity, stakeholder satisfaction and group performance)

Several studies (Kumaraswamy, 1997; Kumaraswamy and Yogeswaran, 1998; Awakul and Ogunlana, 2002; Achariya *et al*, 2006; Jaffar *et. al.* 2011; Ejohwomu *et al*., 2016) have been conducted to identify causes of conflicts in construction projects to include poor financial projection by the client, lack of communication, excessive contract variation, lack of knowledge of site condition, misinterpretation of contract information/documents, poor contract administration, misinterpretation of client requirement by the designer, poor financial projections on the client's side, amongst others.

While it is evident that, conflicts influence the performance of construction projects, the influence of the conflict factors on the different construction projects performance criteria has not been explored. This makes it difficult for project participants to identify the conflict factors that could negatively derail the project performance. This study therefore assessed the influence of conflict factors on Construction Project performance. The present study fills a gap in the literature by providing insights into the influence of conflicts on performance of construction projects in Nigerian construction industry.

Materials and Methods

The main purpose of this study is to determine the influence of conflict factors on construction project performance. The three traditional construction project performance parameters of cost, time and quality were considered. A quantitative methodology was adopted in order to obtain the perception of a reasonable number of construction professionals on the subject matter.

Structured questionnaires with close-ended questions were used to collect data. The quetionnaire was designed in two sections. Section A solicited information regarding the demography of the respondents while section B contained information regarding the main survey. The main survey essentially consist of 21 conflict factors, which were extracted from literature. The perceptions of respondents on influence of the conflict factors on construction project performance were sought. Respondents were asked to rate the influence of the factors on a 5-point scale, where 1 = Very Low, 2 = Low, 3 = Moderate, 4 = High and 5 = Very High. The 5-point likert scale can be found in a similar study of Ishaq *et. al*. (2021) and is therefore adopted for this study. 125 questionnaires were administered to construction professionals (Architects, Builders, Quantity Surveyors and Engineers). 83 properly filled and returned questioners (66.4%) were analysed. Descriptive and inferential statistics were used to analyse the data.

Reliability of the questionnaire was tested using internal consistency (Cronbach's alpha Coefficient). The items were tested on influence of the factors on time, cost and quality performance. Results as presented in Table 1 show that all the values are above 0.70, which indicates that the instrument of data collection is reliable (Vogt, 2007; Joseph *et. al.* 2014). The data collected were analysed using both descriptive and inferential statistics. Section A of the questionnaire were analysed using frequency and percentages while section B of the questionnaire was analysed using, Mean scores, standard deviation and Kruskal-Wallis test. The mean score was used to rank the influence of the conflict factors on the different project performance parameters.

Table 1: Internal Consistency Test (Cronbach's alpha Coefficient) for the measurement items

Test		Number of Items	Cronbach's Alpha Coefficient
Influence of the conflict factors on construction projects performance	Time performance	21	0.872
	Cost performance	21	0.904
	Quality performance	21	0.904

Source: Authors' analysis (2021)

Factor having mean value ranging from 0 to 1.49 is considered as having very low/negligible influence, while factor with mean score within the range of 1.5 to 2.49 is considered as having low influence, factor with mean score within the range of 2.5 to 3.49 is considered as having moderate influence, factor with mean score within the range of 3.5 to 4.49 is considered as having high influence and any factor with mean score ≥ 4.5 is considered as having very high influence. The standard deviation was used to rank the factors where there is a tie in the mean scores. In addition, Kruskal-Wallis test was used to determine the statistical significance of the variation of the influence of the conflict factors on the performance criteria of construction projects. The Test was used because the data does not meet the requirements for parametric tests. It was used to test a hypothesis which is stated as:

Ho: There is no significant difference in the influence of conflict factors on project performance parameters.

H1: There is significant difference in the influence of conflict factors on project performance parameters.

Results and Discussion

Respondents Demography

The preliminary section of the questionnaire was to obtain information about the respondents' profile which include their profession, profession, qualification, working experience and number of projects handled. The summarized profile of respondents is presented in Table 2.

Table 2: Demography of Respondents

Characteristics	Classifications	Frequency	%
Profession of the Respondents	Architect	13	15.7
	Builder	50	60.2
	Quantity Surveyor	16	19.3
	Engineers (Struc./Services)	4	4.8
	Total	**83**	**100**
Academic Qualification	National Diploma	0	0
	Higher National Diploma	15	18.1
	B.Sc/ B.Tech	29	34.9
	Master	34	41.0
	PhD	5	6.0
	Total	**83**	**100**
Working Experience	Less than 5 years	0	0
	5-10 years	15	18.1
	11-15 years	33	39.8
	16-20 years	13	15.7
	Above 20 years	22	26.5
	Total	**83**	**100**
Number of Projects Handled	Less than 5 projects	0	0
	5-10 projects	21	25.3
	11-15 projects	28	33.7
	16-20 projects	9	10.8
	Above 20 projects	25	30.1
	Total	**83**	**100**

Source: Authors' analysis (2021)

Results from Table 2 indicated that the respondents have reasonable background to provide perception on the subject matter of the study. With regard to working experience, 81.9% of the respondents have over 10 years working experience. Similarly, 74.7% of the respondents have participated in more than 10 construction projects. This is considered sufficient to make the respondents be familiar with conflict factors and their influence on project performance.

Influence of Conflict Factors on Time Performance

Respondents were asked to rate influence of the 21 conflict factors on time performance of construction projects. Results are presented in Table 3.

Table 3: Influence of Conflict Factors on Time Performance of Construction Projects

S/N	Conflict Factors	Mean	SD	Rank
1	Delay in payment	4.12	0.79	1
2	Poor financial projection by the client	3.98	0.99	2
3	Lack of communication	3.90	1.06	3
4	Error in contract documents	3.88	1.18	4
5	Excessive contract variation	3.87	0.89	5
6	Poor site investigation report	3.83	0.81	6
7	Change of scope of work as a result of design error	3.80	.947	7
8	poor contract administration	3.76	0.98	8
9	Misinterpretation of contract information/documents	3.75	1.14	9
10	Change of scope of work due to client requirements	3.67	1.06	10
11	Lack of knowledge of site condition	3.65	0.89	11
12	Lack of communication procedures	3.64	0.93	12
13	Misinterpretation of client requirement by the designer	3.55	0.90	13
14	Extension of time by the contractor beyond client's projection	3.51	0.92	14
15	poor contract administration	3.51	0.90	15
16	Offset of unrealistic tender price	3.47	0.97	16
17	contractual claim on extension of time	3.47	0.92	17
18	Deliberate blockage of information flow	3.42	1.10	18
19	low consultancy fee	3.20	0.97	19
20	Public interruption	3.07	1.01	20
21	Language variation	2.72	1.11	21

Source: Authors' analysis (2021)

Based on the results in Table 3, fifteen conflict factors have high influence on time performance of construction projects. This implies that their occurrence or manifestation could affect timely completion of projects to a high extent. The remaining six have moderate influence on time performance of projects. The five topmost factors in order of rank are 'delay in payment', 'poor financial projection by client', 'lack of communication', 'error in contract documents' and 'excessive contract variation'. Delay in payment as agreed by parties often creates cash squeeze on contractors, thereby making it difficult to accomplish works as scheduled.

Influence of Conflict Factors on Cost Performance

Respondents were asked to rate influence of the conflict factors on cost performance of construction projects. Results are presented in Table 4. Results from Table 4 indicated that thirteen conflict factors have high influence on cost performance of construction projects. This implies that their occurrence or manifestation could affect completion of projects as budgeted to a high extent. The remaining eight have moderate influence on cost performance of projects. The five topmost factors in order of rank are 'excessive contract variation', 'poor financial projection by client', 'delay in payment', 'error in contract documents' and 'Change of scope of work as a result of design error'.

Table 4: Influence of conflict factors on cost performance of construction projects

S/N	Conflict Factors	Mean	SD	Rank
1	Excessive contract variation	4.20	0.92	1
2	Poor financial projection by the client	3.99	0.97	2
3	Delay in payment	3.93	1.08	3
4	Error in contract documents	3.84	1.20	4
5	Change of scope of work as a result of design error	3.82	1.01	5
6	Change of scope of work due to client requirements	3.71	1.04	6
7	Misinterpretation of contract information/documents	3.70	1.11	7
8	Lack of knowledge of site condition	3.63	1.10	8
9	Lack of communication	3.59	1.33	9
10	Poor site investigation report	3.58	0.96	10
11	poor contract administration	3.57	0.91	11
12	poor contract administration	3.51	0.94	12
13	Extension of time by the contractor beyond client's projection	3.51	0.97	13
14	Lack of communication procedures	3.45	0.93	14
15	Misinterpretation of client requirement by the designer	3.42	1.07	15
16	Low consultancy fee	3.33	1.34	16
17	Offset of unrealistic tender price	3.33	1.08	17
18	Deliberate blockage of information flow	3.31	1.20	18
19	Contractual claim on extension of time	3.28	1.16	19
20	Public interruption	2.78	1.25	20
21	Language variation	2.63	1.12	21

Source: Authors' analysis (2021)

Except for the fifth ranked factor, the other four also appear among the top five ranked factors that influence time performance. There are high similarity in the five least ranked factors in terms of their influences on both time and cost performances of projects.

Influence of Conflict Factors on Quality Performance

Respondents were asked to rate influence of the conflict factors on quality performance of construction projects. Results are presented in Table 5.

Table 5: Influence of Conflict Factors on Quality Performance of Construction Projects

S/N	**Conflict Factors**	**Mean**	**SD**	**Rank**
1	Poor site investigation report	3.87	1.05	1
2	Error in contract documents	3.81	1.19	2
3	poor financial projection by the client	3.75	1.09	3
4	Excessive contract variation	3.73	1.13	4
5	poor contract administration	3.70	0.96	5
6	Lack of communication	3.63	1.31	6
7	Delay in payment	3.58	1.32	7
8	poor contract administration	3.57	1.03	8
9	Lack of communication procedures	3.55	0.98	9
10	Change of scope of work due to client requirements	3.55	1.07	10
11	Lack of knowledge of site condition	3.54	1.26	11
12	Misinterpretation of client requirement by the designer	3.52	1.17	12
13	Change of scope of work as a result of design error	3.52	1.19	13
14	Misinterpretation of contract information/documents	3.42	1.16	14
15	Deliberate blockage of information flow	3.40	1.17	15
16	Contractual claim on extension of time	3.36	1.05	16
17	Extension of time by the contractor beyond client's projection	3.31	1.09	17
18	Offset of unrealistic tender price	3.25	1.17	18
19	Low consultancy fee	3.11	1.23	19
20	public interruption	2.80	1.20	20
21	Language variation	2.72	1.11	21

Source: Authors' analysis (2021)

Based on the results in Table 5, thirteen conflict factors have high influence on quality performance of construction projects. This implies that their occurrence or manifestation could affect quality of the end product to a high extent. The remaining eight have moderate influence on quality performance of projects. The five topmost factors in order of rank are 'poor site investigation report', 'error in contract documents', 'poor financial projection by client', 'excessive contract variation' and 'poor contract administration'. Two of the topmost five ranked factors ('error in contract documents' and 'excessive contract variation') are common in terms of their influence on time and cost performance. There are also some similarities in the five least ranked factors with those of time and cost performances of projects.

Variation of the Influence of Conflict Factors on different Project Performance Criteria.

Results indicating the influence of conflict factors on time, cost and quality performances have been presented separately in Tables 3, 4 and 5 respectively. The results have depicted some similarities, especially with regard to the five topmost and five lest ranked factors. In order to have a clearer picture of the influence of the factors on the three project performance dimensions, combined results are presented in Table 6.

Table 6: Influence of Conflict Factors across Time, Cost and Quality Performance.

S/N	Conflict Factors	Project Performance Indicators					
		Time		Cost		Quality	
		Mean	Rank	Mean	Rank	Mean	Rank
1	Delay in payment	4.12	1	3.93	3	3.58	7
2	Poor financial projection by the client	3.98	2	3.99	2	3.75	3
3	Lack of communication	3.90	3	3.59	9	3.63	6
4	Error in contract documents	3.88	4	3.84	4	3.81	2
5	Excessive contract variation	3.87	5	4.20	1	3.73	4
6	poor site investigation report	3.83	6	3.58	10	3.87	1
7	Change of scope of work as a result of design error	3.80	7	3.82	5	3.52	13
8	poor contract administration	3.76	8	3.57	11	3.70	5
9	Misinterpretation of contract information/documents	3.75	9	3.70	7	3.42	14
10	Change of scope of work due to client requirements	3.67	10	3.71	6	3.55	10
11	Lack of knowledge of site condition	3.65	11	3.63	8	3.54	11
12	Lack of communication procedures	3.64	12	3.45	14	3.55	9
13	misinterpretation of client requirement by the designer	3.55	13	3.42	15	3.52	12
14	Extension of time by the contractor beyond client's projection	3.51	14	3.51	13	3.31	17
15	poor contract administration	3.51	15	3.51	12	3.57	8
16	Offset of unrealistic tender price	3.47	16	3.33	17	3.25	18
17	contractual claim on extension of time	3.47	17	3.28	19	3.36	16
18	Deliberate blockage of information flow	3.42	18	3.31	18	3.40	15
19	Low consultancy fee	3.20	19	3.33	16	3.11	19
20	Public interruption	3.07	20	2.78	20	2.80	20
21	Language variation	2.72	21	2.63	21	2.72	21
	Mean	**3.61**		**3.53**		**3.45**	

Source: Authors' analysis (2021)

From the results in Table 6, the influence of the respective conflict factors across time, cost and quality performance of projects can be seen. This depicts the extent to which each of the factors exerts influence across the performance parameters. For example, 'delay in payment' was ranked 1st, 3rd and 7th in terms of influence on time, cost and quality performance respectively. Similarly, 'poor financial planning by client is ranked 2nd, 2nd and 3rd respectively across the three performance parameters. Although majority of the factors do not ranked the same, those at the top generally have close ranking across the three dimensions. Out of the top 10 ranked factors that influence time, 9 and 8 feature under cost and quality performance

respectively. Similarly, the bottom ranked factors have close ranking across time, cost and quality performance. It is worth noting that the two conflict factors at the bottom of the pile ranked the same across the three performance measures.

Despite the similarity in the extent of influence of the conflict factors as highlighted above, their ranking across time, cost and quality performance are not the same, except in the two cited cases. For the purpose of making an overall judgement, this warrants determining whether the variation in influence is statistically significant or otherwise. Hence, Kruskal-Wallis test was conducted to test the earlier stated hypothesis. Result of the test is presented in Table 7.

Table 7: Kruskal Wallis Test on Influence of Conflict Factors on Project Performance Parameters

Hypothesis Test Summary			
Null Hypothesis	Test	Sig.	Decision
The distribution of influence of Conflict Factors is the same across categories of Project Performance Criteria	Independent Samples Kruskal-Wallis Test	.286	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05
Source: Authors' Analysis (2021)

The Kruskal Wallis Test results in Table 7 suggests that the null hypothesis should be accepted (p value obtained is 0.286 for $P \leq 0.05$). The variation in the influence of conflict factors on time, cost and quality performance of construction project is statistically not significant. This implies that the influence of conflict factors across the construction projects performance criteria is similar. This could be because of the correlation that exists among the different performance criteria. For instance, inefficiency or decrease in time performance could possibly affect the cost and quality performance as well.

Conclusions

This study sets out to assess the influence of conflict factors on time, cost and quality performance of construction projects. The study further sought to determine variation in the influence of the conflict factors across the three project performance parameters. Based on the findings of the study, it is concluded that:

i. At least 13 conflict factors have high influence on time, cost and quality performance of construction projects.
ii. The influence of conflict factors on time, cost and quality performance of construction projects is similar.

The study recommends that construction stakeholders should strive to minimise the occurrence of factors which give rise to conflict in any given project so as to achieve optimal project performance.

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