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## ASSESSMENT OF FACTORS THAT AFFECT COST CONTROL BY NIGERIAN CONSTRUCTION CONTRACTORS

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### ABSTRACT

Cost control is an important issue in construction project management. It is widely practiced by contractors in Nigeria and need to carry out through the life of contraction projects. This paper investigates in to the cost control in construction of building and civil engineering projects in Nigeria. Factors affecting the cost of construction in carrying out the project were identified and assessed. Problems faced by contractors in controlling costs were also assessed accordingly .Questionnaires were administered to construction contractors to elicit information with regard to current practice of cost control. Consequently, the data were analyzed using software spss to determine the mean score for each factor which was subsequently ranked accordingly. The student t-test was also used to determine whether there is an agreement in the opinion among the principal participants with regard to factors of cost control. The result shows that the main factors responsible for increasing cost of project are wrong method of estimation with mean score (8.60) ranked highest followed by incorrect planning with mean score (8.20) ranked second, high cost of transportation with the mean score (8.0) ranked fourth and fluctuation of price of material with mean score (7.60) ranked third. Spearman ranking was also calculated to determine the level of agreement between the principal participants. The results of the hypotheses show that there is agreement between contractors' and clients' opinion with respect to the factors that affect cost control. It also show that there is no agreement in such opinion between Consultants/Clients and Contractors/Consultants.

**Significance:** This paper shows some light as to the differences in opinions, and the most agreed factors that affect cost control during projects executions as indicated by the clients, consultants and contractors in the industry.

**Key words:** *Assessment, Cost, Control, Contraction industry*

### INTRODUCTION

The construction industry has numerous participants in the process of planning, designing, financing, constructing and operating its works with different perspective on project management. Construction is a highly sophisticated, competitive and technical business (Melvin ,1979). The growing need for construction of all types coupled with a tight monetary supply is increasingly providing the construction industry with a big challenge to cut cost. According to Mendelson and Greenfield (1996) the remaining part of the twentieth century would involve corporations, institutions and government in a race to survive. They asserted that dwindling economic fortune of nations economies around the World have geared up the

participant in these sectors (the client in particular) to take up the challenge of ensuring efficient use of their various resources to obtain value for money in terms of performance. The total cost of construction in normal circumstances is expected to be the sum of the following cost: Materials, Labour, Site Overheads, Equipment/Plant, Head office Cost and Profit but in many parts of the world particularly in Nigeria, there are other costs to be allowed for. However, these costs have obvious negative implications for the major principal participants in particular, and the industry in general (Mbachu et al, 2004). To the client, high cost implies added costs over and above those initially agreed upon at the onset, resulting in less returns on investment. The objective of this study was to identify and assess the factors that affect cost control in the event of construction of building and civil engineering projects based on the Nigerian concept and background as indicated by the three principal participants of the industry: Client, Consultant and Contractor respectively. It is also the objective of this study to evaluate the degree of disagreement of the rankings of these factors between any two groups of these principal participants.

## **METHOD**

Questionnaires were used to source the required data and to test the hypothesis postulated for the study. These were conducted in three parts, first part contained such things as the names of respondent's organization, the area of specialization, area of operation of the organizations, age of the organization, the role of the organization in the construction industry (that is whether client, consultant or contractors) among others. Part two concerns the respondents' characteristics. It involves such things as the construction industry work experience, profession of the respondents, registration with professional bodies and regulatory agencies. The last part of the questionnaire contained 14 numbers of factors which respondents were asked to rate. The practitioners were to rate each of these factors according to their perception as either being very important, important, somewhat important or not important with weighted score marks of 4, 3, 2 or 1 respectively. The total sample used for the study was 40 returned questionnaires (Clients N= 12, Consultants N= 18 and Contractors N= 10)

## **RESULTS AND DISCUSSION**

### **Results**

The result of the 14 factors as returned by the respondents and their ratings was prepared and presented in tables 1, 2, and 3 below respectively. The tables also indicating the mean scores and values by the different groups and the general. The result shows that all the three groups perceived the listed factors differently. The clients' group perceived that the most important factor affecting cost control is contract procedure the highest mean scores (M S) of 3.20. The consultants however perceived the Difficulty in collection of standard data to be the most important factor with MS of 8.40. For the contractors, difficulty in collection of standard data is ranked the highest with MS of 3.20.

**Table 1:** Respondents' ranking of factors (Most to least critical) that affect cost control  
**Clients' Ranking ( N = 12)**

S/N	FACTORS AFFECTING COST OF CONSTRUCTION	SPSS MEAN	RANK
1	Contract procedure	3.20	1
2	Changing of weather condition	3.00	2
3	Difficulty in collection of standard data	2.80	3
4	Fluctuation of price of material	2.60	4
5	Wrong method of estimation	2.40	5
6	Additional cost to carry out the system	2.40	5
7	High cost of transportation	2.20	6
8	Supplier manipulation	2.20	6
19	Shortage of material, labour or mechanical plant	2.00	8
10	High cost of labour	2.00	8
11	Duration of the project	1.80	10
12	Frequent design changes	1.60	11
13	Incorrect planning	1.60	11
14	Cost of material	1.60	12

**Table 2:** Respondents' Ranking of factors (Most to least critical) that affect cost control  
**Consultants' Ranking ( N = 18)**

S/N	FACTORS AFFECTING COST OF CONSTRUCTION	SPSSMEAN	RANK
1	Difficulty in collection of standard data	8.40	1
	Changing of weather condition	6.80	2
2	Contract procedure	6.60	3
3	Duration of the project	6.20	4
4	Shortage of material, labour or mechanical plant	6.00	5

<b>5</b>	Fluctuation of price of material	5.40	6
<b>6</b>	Wrong method of estimation	5.20	7
<b>7</b>	Additional cost to carry out the system	4.80	8
<b>8</b>	High cost of transportation	4.40	9
<b>9</b>	High cost of labour	3.80	10
<b>10</b>	Frequent design changes	3.20	11
<b>11</b>	Incorrect planning	3.00	12
<b>12</b>	Supplier manipulation	2.60	13
<b>14</b>	Cost of material	1.60	14

**Table 3:** Respondents' Ranking of factors (Most to least critical) that affect cost control  
**Contractors' Ranking ( N = 10)**

<b>S/N</b>	<b>FACTORS AFFECTING COST OF CONSTRUCTION</b>	<b>SPSSMEAN</b>	<b>RANK</b>
<b>1</b>	Difficulty in collection of standard data	3.20	1
<b>2</b>	Contract procedure	2.80	2
<b>3</b>	Changing of weather condition	2.80	2
<b>4</b>	Fluctuation of price of material	2.60	3
<b>5</b>	Wrong method of estimation	2.40	4
<b>6</b>	Additional cost to carry out the system	2.40	4
<b>7</b>	Supplier manipulation	2.20	5
<b>8</b>	High cost of transportation	2.20	5
<b>9</b>	Shortage of material, labour or mechanical plant	2.00	6
<b>10</b>	High cost of labour	2.00	6
<b>11</b>	Duration of the project	1.80	7
<b>12</b>	Frequent design changes	1.60	8
<b>13</b>	Incorrect planning	1.60	8
<b>14</b>	Cost of material	1.60	8

**Table 4:** Respondents' Ranking of Desirable Qualities (Most to least critical) of an Effective Project Leader.**Overall Ranking (N= 40)**

S/NO	FACTORS	SPSS MEAN	RANK
1	Wrong method of estimation	8.60	1
2	Incorrect planning	8.20	2
3	High cost of transportation	8.00	3
4	Duration of the project	7.80	4
5	Difficulty in collection of standard data	7.60	5
6	Additional cost to carry out the system	7.60	5
7	Fluctuation of price of materials	7.60	6
8	High cost of labour	7.60	6
9	Shortage of material, labor or mechanical plant	7.40	7
10	Contract procedure	7.2	8
11	Changing of environment of construction work	6.80	9
12	Supplier manipulation	6.40	10
13	Cost of materials	4.60	11

**DISCUSSION**

As can be seen from table 1, the clients ranked contract procedure as the most important factor with a mean score of 3.20. Table 2 shows that Difficulty in collection of standard data with MS 8.40 is the most important for the consultants. Table 3 however, indicates that difficulty in collection of standard data as the most important attribute with MS of 3.20. Further comparison of the mean scores and the ranking amongst the three groups as shown in table 4 however, shows that Wrong method of estimation was adjudged the most important factor with 8.60 mean score. This indicates that there are disagreements amongst the groups as to the most critical factor. This could be a reflection of the diversity and background of the organizations were the respondents were chosen from and their roles in the construction industry.

## **Test of Hypotheses**

For further analysis and better understanding of the findings in this work, the following hypotheses were postulated and tested as follows:

### **Hypothesis 1 (H1)**

Ho: In general, difficulty in collection of standard data will not be perceived to be the most important of all the factors affecting cost control during project execution.

HA: In general, difficulty in collection of standard data will be perceived to be the most important of all the factors affecting cost control during project execution.

### **Hypothesis 2 (H2)**

Ho: There will be no significant difference between perception of clients and consultants regarding the ranking of factors that affect cost control during project execution.

HA: There will be significant difference between perception of clients and consultants regarding the ranking of factors that affect cost control during project execution.

### **HYPOTHESIS 3 (H3)**

Ho: There will be no significant difference between perception of consultants and contractors regarding the ranking of desirable qualities of an effective project manager.

HA: There will be significant difference between perception of consultants and contractors regarding the ranking of factors that affect cost control during project execution

### **Hypothesis 4 (H4)**

Ho: There will be no significant difference between perception of clients and contractors regarding the ranking of factors that affect cost control during project execution.

HA: There will be significant difference between perception of clients and contractors regarding the ranking of factors that affect cost control during project execution.

### **Proof of H1**

As computed and shown in table 4, the ranking of the overall of the respondents indicates the highest mean score of 8.60 for wrong method of estimation. This was followed by incorrect planning (8.20), high cost of transportation (8.00); duration of project (7.80); difficulty in collection of standard data (7.60); additional cost to carry out the system (7.60); fluctuation of price of materials (7.60); high cost of labour (7.60); shortage of material, labor or mechanical plant (7.40). Since difficulty in collection of standard data came fifth in the ranking, the null hypothesis is accepted while the alternative hypothesis is rejected. Table 5.0 below gives the calculated values of  $R_s$  and t-test (calculated and tabulated) between any two groups. H2: for clients' and consultants' perception of factors affecting cost control, the high correlation coefficient  $R_s$  of 0.90 indicates the two groups agree in the overall rankings. Since  $t_{cal} > t_{tab}$  at 5% significant level the null hypothesis of no significant difference in the perception of the two groups is accepted and the alternative hypothesis rejected. H3: For consultants' and contractors' perception of factors affecting cost control the high

correlation coefficient  $R_s$  of 0.70 indicates that there is agreement in the overall rankings of desirable qualities between the two groups. Since  $t_{cal} > t_{tab}$  at 5% significant level the null hypothesis is accepted while the alternative one rejected.  $H_4$ : For clients/contractors the correlation coefficient here is also low 0.50. And since  $t_{cal} < t_{tab}$  at 5% significant level indicates that the two groups did not agree in the overall ranking. Therefore, null hypothesis is rejected and the alternative one accepted.

**Table 5:** Test of Agreement on the Ranking of the Desirable Qualities of an Effective Project Managers Perceived by Different Groups

Project participants	$R_s$	$t_{cal}$	$t_{tab}$	Accept $H_0$	P value
Consultants/Clients	0.90	1.39	1.26	Yes	<0.05
Contractors/Consultants	0.70	1.50	1.26	Yes	<0.05
Clients/Contractors	0.50	0.23	1.26	NO	>0.05

**CONCLUSION**

It is found that the consensus of practitioners’ opinion as to the most important factor from the overall ranking is “wrong method of estimation” which was rated the highest by all the respondents as overall ranking among the factors that affect the cost control with 8.60 mean score. To the clients, contract procedure is the most important factor with 3.20 mean score. The consultants’ perceived difficulty in collection of standard data as the most important factor with mean score of 8.40. To contractors difficulty in collection of standard data is also seen to be the most important factor with mean score 3.20. In general the study reveals that at least more than two groups agreed in the overall factors which were seen from high correlation coefficients of 0.90 for clients and consultants, 0.70 for consultants and contractors. However, the low correlation of 0.50 for clients and contractors group indicates a disagreement within the group as to the factors that control cost. Therefore, emphasis on the factors of cost control thus depends on the organization of the respondents in the construction industry.

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