CLIENT'S CONSTRAINING FACTORS TO CONSTRUCTION PROJECT MANAGEMENT SUCCESS IN NIGERIA: A SYSTEMS ANALYTICAL APPROACH

NWACHUKWU, C.C
Project Management Technology Department,
Federal University of Technology Owerri, Imo State, Nigeria
E-Mail; nedumchisma@yahoo.com

Abstract

This study analyzed client's related factors that constrain project management success of public and private sector construction in Nigeria. Issues that concern clients in any project can not be undermined as they are the owners and the initiators of project proposals. It is assumed that success, failure or abandonment of projects lay squarely in their hands. This is very relevant as any constrain to the success in the construction sector has a multiplier effect on the overall economic growth of the nation. The construction of Imo State secretariat by ten different construction firms, the construction of Owerri Onitsha road and the construction of Oceanic Bank building along Douglas Road Owerri are few examples of public(Government) and private (Organization)clients. The empirical analysis is based on these projects and many other related ones. The findings will help stakeholders in the industry to plan and execute successful projects thereby reducing the rate at which projects fail, abandoned and or collapse in Nigeria. However, clients related factors can not assure project management success in the construction industry as an index without a holistic analysis of other constraining factors from other subsystems. Data analyses on the subject were computed based on their Relative Relevance Indices of Attribute. Factor analysis was used to collapse the variables to fewer but interrelated variables. The major finding is that the client factors exact high level negative influence to success in the construction project management in Nigeria especially in the public sector.

Key words: Project success, Client's constraints, Factor analysis

Introduction

Construction industry has been ranked among the top four out of about twenty economic sectors in terms of inter-sector linkages. The importance of this sector as an agent of development is enhanced by its ability to provide gainful employment for the teeming population of the nation. According to Roy (2005) "it is evidenced that noticeable development and the aesthetic transformation of the environment is bound up with and predicated on the construction industry". Construction industry is a major index as a factor in the social and political integration of the society and ranks as one of the major budgetary areas of developing economies (Nwachukwu, 2008).

The construction industry is proven to be the corner stone and bedrock of rapid economic growth of any nation (Bhavesh, 2006). This is underscored by the fact that capital projects in Nigerian budget mostly represent over 40% of the total projected expenditure in both Federal and state governments annual budgets and also in the nations various development and rolling plans. The products of construction industry are desired in all sectors

of the economy for the services which they help to create for these sectors (Nwachukwu, 2008).

The factors that constrain success in project management implementation process, which include time, cost, quality and material as direct factors and indirect factors such as environment, client, project management, design and construction seem not to have been addressed holistically using systems approach. The end result is huge capital expenditure with few or no successful projects to show for it. This research is limited to the client's related factors as a significant system that constrains project management success of public and private sector construction in Nigeria.

The Objective

The study is aimed at identifying and analysing clients related factors constraining project management success of private and public sector construction in Nigeria. The analysis will reflect the strength of each factor and the rate at which it influences failure, abandonment and collapse of construction projects. The result of the findings if implemented is expected to reduce the rate at which projects fail in Nigeria.

Methodology

Data for the analysis was through direct and indirect sources. A five point-Likert scale format was used in the questionnaire design used as a direct source of gathering information from public and private clients, their consultants and contractors. Factor analysis was used to collapse the variables to fewer but interrelated variables; the ANOVA was used to confirm the differences in the level of relevance of these factors constraining project success. The analysis focused on clients related problems in the construction of Imo State secretariat by ten different construction firms, the construction of Owerri Onitsha road and the construction of Oceanic Bank building along Douglas road Owerri.

The formula is **RRIcl = ∑cli/CLi x 100**

Research Model

The model below was developed as a holistic systems approach to solving the problem of project failure, abandonment, and frequent collapse of constructed structures in Nigeria. The arrows in the model below show how the variables interrelate and are intra-dependent.

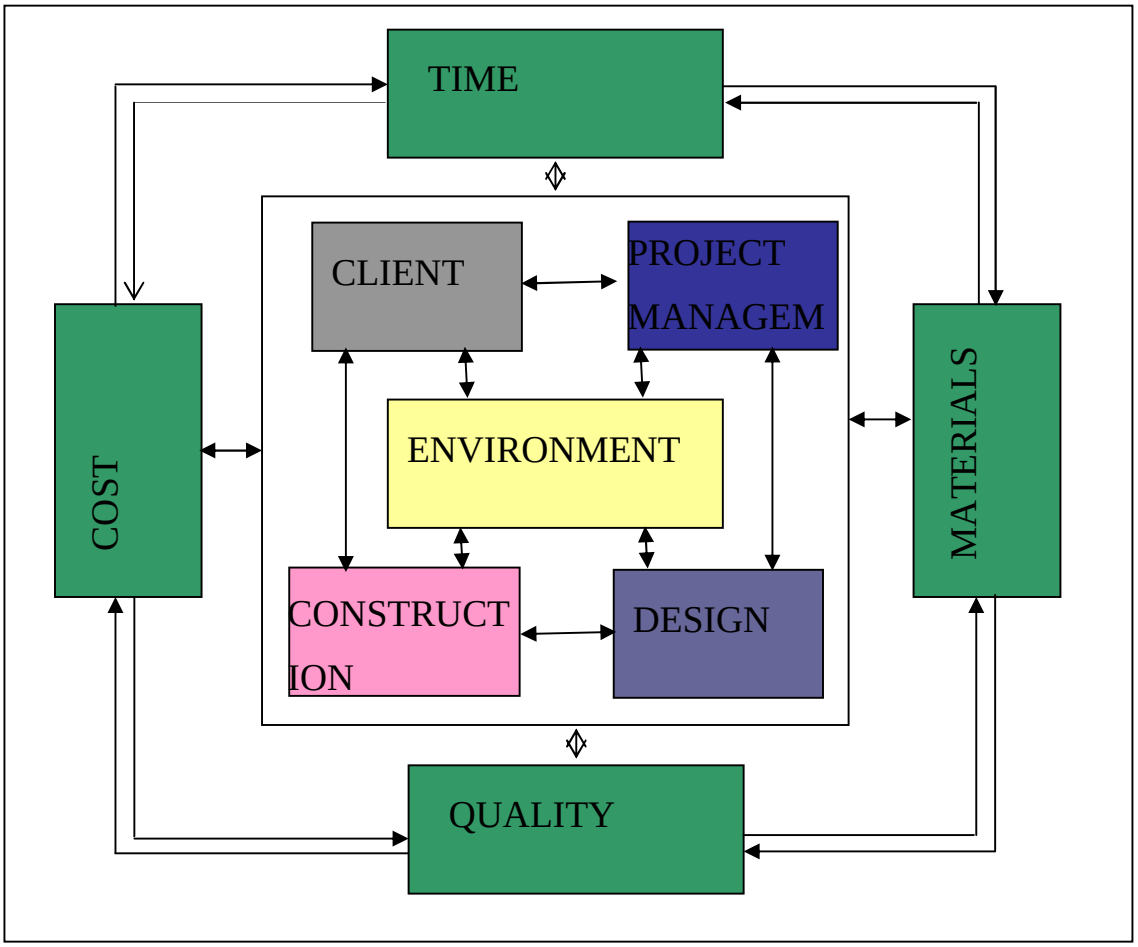

Figure 1: The Construction Project Management Success Interactive Model composed by the researcher based on existing literature.

The Identified Client Related Factors

These factors are the inability to select competent design team which may include the Architect, Engineer, Quantity Surveyor, various Contractors; the Provision of robust brief by the client without the consent of the designers and the project manager; lack of top management support for motivation to the project team members; failure of the Client to provide the yardstick for a firm and clear objectives as regards cost, time, materials specification and quality standards; the client's attitude towards ensuring timely availability of finance for the project and prompt payment for work executed; clients influence in selection of incompetent and ill-experienced contractors and sub-contractors; and client's inability to minimize bureaucracy in decision making process. Others include client's interference with the system designers and contractors capabilities; clients short-sight in the selection of competent and experienced project manager; clients influence in employing unqualified technically skilled personnel with managerial ability; Client's attitude towards budgetary control in project implementation process; client's attitude towards schedule control especially fixed time with liquidated damage clause; client's attitude towards strict compliance to quality standards especially in materials procurement; and clients not

insistence on details of design and documentation to be completed before site work. Some other factors include bribery and corruption of clients' representatives especially in public project monitoring; client's inability to provide a good working relationship among the project stakeholders; client's untimely feed-back on approvals and regular meetings and reviews; lack of adequate information on clients' changing taste during the implementation process and client's inability to maintain sustained interest and reduce conflicts in the implementation process.

Public Sector Principle Factor Analysis Results

Public sector principle factor analysis results show that three factors that were extracted from the public sector construction accounted for 87.5% of the total variance. The details of the factor loadings, eigenvalues and proportion of variance are presented in Table 1 below. The details show that the first factor accounted for 51.3% of the variance, the second is only 13.8% of the total variations, the third is 12.4% and the rest for progressive proportions.

Table 1: Client Subsystem Eigen Values Greater Cumulative Percentage Variance

	A – PUBLIC			B – PRIVATE		
FACTORS	**EIGEN VALUES**	**PERCENTAGE VARIANCE**	**CUMULATIVE PERCENTAGE VARIANCE**	**EIGEN VALUES**	**PERCENTAGE VARIANCE**	**CUMULATIVE PERCENTAGE VARIANCE**
1.	0.01245	51.3	51.3	1.00340	60.0	6.0.0
2.	0.03262	13.82	65.1	0.111240	19.0	79.0
3.	0.04301	12.4	87.5	0.02451	10.2	89.2
4.	0.02261			0.02251	10.8	100

Source: Computer Analysis of the Constraining Factors.

The strongest factor is defined by fifteen variables which represented the client subsystem in the questionnaire. Some of the constraining variables loaded high while few others loaded higher. The very highly loading variables relate to the selection of competent contractor and project manager, client's top management support and motivation, clear objectives, firm and attitude of the stake holders in the construction sector as regards project cost. The variables that loaded higher include: the selection of competent design team, attitude towards schedule and quality standards, robust brief, minimum bureaucracy, complete documentation before site works, client's sustained interest and conflict resolution. Others include: clients top management support, firm and clear objectives as regards cost, time and quality standards, selection of competent project manager and design team.

Uping using principal factors
A - public sector construction
Table 2: client Subsystems Variable Grouping Using Principal Factors
A - Public Sector Construction

Factor	Variable groupings into dimensions	No of variables loaded per factor	Factor Name
1.	F1 F2 F3 F4 F5 F6 F7 Q8 0.00885 0.00670 0.00733 0.00436 0.00630 0.00680 0.00946 0.00906 F9 F10 F11 F12 F14 F15 F16 0.00202 0.00376 0.00426 0.00636 0.00075 0.00829 0.63699	15	Client top management support, firm & clear objectives as regards cost, time & quality standards, selection of competent project manager, design team & contractor & prompt payment for work done
2.	F13 0.00588	1	Bribery & corruption of clients representatives
3.	NIL	NIL	NIL

Source: Computer Analysis of the Study Data
Table 2B - Private Sector Construction

Factor	Extracted variables and their loadings	No of variables loaded per factor	Factor Name
1.	F1 F2 F3 F4 F5 F6 F7 F8 0.00797 0.00905 0.00339 0.00714 0.00124 0.0011 0.00698 0.00552 F9 F10 F11 F12 F14 15 16 0.00219 0.00313 0.00751 0.00739 0.00791 0.00191 0009248	15	Selection of competent design, team, contractors, project manager, clients firm attitude & clear objectives as regards cost, time, quality, prompt payment for work done & robust brief
2.	NIL	NIL	NIL
3.	NIL	NIL	NIL
4.	F13 0.00965	1	Bribery and corruption of clients representatives

Source: Computer Analysis of the Study Data

Results of Public Sector Orthogonal Varimax Rotated Factors

Results of public sector orthogonal varimax rotated factors show how variables are grouped into dimensions for the client subsystem public sector construction. One of the strongest factors is defined by four out of the fifteen variables. Two variables load very high. Others load high outside one that load moderately low. The very highly loading variable is the selection of competent contractors, competent project managers and prompt payment for work executed. The third and last factor is defined by 4 variables. One variable load very high, another loading higher and two loaded moderately. The very highly loading variable is bribery and corruption of client's representative. The variable loading high is the lack of sustained interests and conflicts within organisation. Two variables that load moderately are the client's attitude towards schedule control and lack of information on clients needs. In consideration of the loading patterns of these variables, the major factor is known as bribery and corruption of client's representatives and lack of sustained interest and conflict within the organisation.

Lastly and in summary, the success of the clients subsystem in public sector is determined by the following factors: provision of robust brief and top management support and motivation, lack of sustained interest and conflict within the organization, the selection of competent contractors, competent project managers and prompt payment for work executed, bribery and corruption of client's representatives and the selection of competent design team.

Private Sector Construction Factor Analysis Results

Private sector construction factor analysis results show that some factors extracted in the public sector accounted almost 100% of the total variance. The details of the factor loadings of the eigenvalues and the proportion of variance account for each factor are presented in the Table 2 (A and B) above. The dominant factor, 1, accounts for 60% variance, the second is only 19% of the total variation, the third is 10.27%, and the fourth is 10.8% and the rest are of progressively lesser proportion. The strongest factor has fourteen variables as in the public sector. The second and the third factors all loaded relatively low and no variable is defined under these factors. The fourth factor has only one variable which is bribery and corruption of client's representatives. It loaded moderately and is captioned bribery and corruption. Part of the variables that were defined as factor 1, only four of them have very high loadings, five loaded high and the remaining five loaded moderately in the analysis scaling. The very highly loading variables are provision of robust brief, firm and clear objective as regards cost, time and quality standards, client attitude towards budgetary control and the selection of competent design team. The highly loading variables include: selection of competent manager, motivation, prompt payment for work done and top management support

Table 3: Orthogonally Varimax Rotated Factors of Client Subsystems

A - Public Sector Construction

Factor	Variable grouping into Dimensions	No of variables loaded per factor	Factor Name
1.	F1 F2 F3 F11 F12 F14 0.00927 0.00860 0.00065 0.00085 0.00075 0.00821	6	The selection of competent design team, robust brief and top management support
2.	F4 F5 F6 F7 F8 F9 0.00581 0.00162 0.00252 0.00390 0.00116 0.00801	6	The selection of competent contractor, competent manager & prompt payment for work executed
3.	F10 F13 F15 F16 0.00701 0.00595 0.00954 0.00079	4	Bribery and corruption of clients' representatives and lack of sustained interest & conflict within the organisation

Source: Computer Analysis of the Study Data

Table 3B - Private Sector Construction

Factor	Variable grouping into Dimensions	No of variables loaded per factor	Factor Name
1.	F10 F11 F12 F14 F15 F16 0.00581 0.00813 0.00886 0.00883 0.00762 0.00356	5	Insistence on complete design, documentation robust brief before site work, client's timely feedback, reviews, sustained interest & firm attitude towards quality control and schedule
2.	F1 F2 F4 F5 F6 F8 0.00864 0.00633 0.00750 0.00049 0.00330 0.00210	5	The selection of computer design team, project manager experienced contractors, clear firm objectives & prompt payment for work executed
3.	F3 F7 F9 0.00155 0.00756 0.00159	4	Top management support & motivation, client's attitude towards budgetary control & efficient decision making mechanism
4.	F13 0.008081	0	Bribery and corruption of client's representatives

Source: Computer Analysis of the Research Data

Private Sector Orthogonally Varimax Rotated Factor Analysis Result

Private sector orthogonally varimax rotated factor analysis results show the variable grouping into dimensions for the client subsystem in the private sector construction. The first and the strongest factor, is defined by five out of fourteen variables. The clients' public sector loadings have also variables that load similarly with the private sector loadings. The next high loading variables are the client's attitude towards quality standard, lacking information on clients needs and lack of sustained interest and conflict within the organisation. While the moderate loading variable is the client's attitude towards schedule control. Another factor in the process is defined by eight critical variables out of the twelve variables. The very highly loading variables are the selection of competent contractors and competent project managers, skilled technically and managerial ability of the project manager. The highly loading variables are the selection of competent design team, availability of finance, and prompt payment for the work executed. The moderately loading variables are the provision of robust brief in consultation with the designer's project manager and the firm and clear objectives as regards cost, time and quality standards.

Private Sector Indirect Variables

Private sector indirect variable scores for the construction sector are 65.52%, 65.2%, 64.98%, 66.19%, and 65.93%. The subsystems are that of the environment, client, design, construction, project management respectively. The client subsystem has the highest mean RRI score followed by the construction and project management subsystems. This shows the relative importance of these subsystems in predicting the success/failure of a construction project success. This supports common sense in that the client is the sponsor of the project and has enormous powers to influence the project outcome. The next subsystem, the construction subsystem also has marked effect on the project outcome in that this subsystem is responsible for the physical realization of the project. The project management subsystem has a mean score of 78.04%.This important subsystem co-ordinates or manages the entire project (i.e. all the subsystems) thus justifying high RRI score of the sector and supports the preconceptions that private sector projects are better managed and are more successful.

Table 4 RRI Distribution for Public Sector Construction (Indirect Variables)

RRI Regions	SUBSYSTEMS				SYSTEM	
	Environmental 80 No of cases %	Client 80 No of cases %	Design 80 No of cases %	Construction 80 No of cases %	Project management 80 No of cases %	80 No of cases %
Mean	66.991	69.136	66.421	68.938	68.038	67.922
Minimum	1 7.273	17.059	20.000	19.333	20.000	19.589
Maximum	99.055	99.055	99.055	99.055	99.055	99.055
Range	62.727	62.941	60.000	60.667	60.000	60.411
Standard Dev.	7.017	4.023	4.046	3.014	4.008	1.079
Variance	221.002	296.639	201.283	199.830	200.234	190.943
Kurtosis	0.838	0.741	0.176	0.834	0.017	.005
Skewness	-0.221	-0.658	-0.359	-0.728	-0.537	-0.510
Standard error	0.685	0.319	0.321	0.300	0.402	0.193
Sum	599.000	742.112	535.526	819.900	718.013	705.005

Source: Author's Field Work, 2007-2008.

The construction subsystem has the highest mean score followed by the project management subsystem before the client subsystem which is the most important subsystem in public sector construction. The design subsystem came fourth followed by the system and lastly the environmental subsystem. The environmental subsystems are mainly political,

social, cultural and economic factors and these naturally have more marked effect on public projects than the private sector project.

Table 5 RRI Distribution for Private Sector Construction (Indirect variables)

RRI Regions	SUBSYSTEMS					SYSTEM
	Environmental 80 No of cases	Client 80 No of cases	Design 80 No of cases	Construction 80 No of cases	Project management 80 No of cases	80 No of cases
Mean	55.519	65.200	64.975	66.189	65.929	64.009
Minimum	4.053	2.041	2.082	30.06	1.460	4.081
Maximum	98.000	98.000	98.000	98.000	98.00	98.000
Range	84.545	57.059	51.111	50.104	56.033	45.016
Standard Dev.	27.650	24.201	23.654	23.904	25.509	22.206
Variance	387.642	306.228	296.422	294.393	343.408	248.964
Kurtosis	0.078	-0.179	-0.461	0.018	-0.041	-0.361
Skewness	-0.498	-0.540	-0.298	-0.643	-0.592	-0.221
Standard error	-1.615	1.338	1.284	1.308	1.465	1.152
Sum	403..631	497..642	472..225	609..337	579..912	363..010
Total sum of observation	**80**	**80**	**80**	**80**	**80**	**80**

Source: Author's Field Work, 2007-2008.

The study analysis confirmed that the appointment of a reputable and competent contractor is a panacea to project management success in a private sector construction. Another important subsystem in the private sector construction is the project management effort that co-ordinates and manages the entire project implementation process. The kurtosis for the client, design, project management and systems are all negative. The skewness, also, are all negative, similar to that of the private sector which shows that the level of their impact are the same in both sectors.

Table 6: Distribution of Respondents RRI Scores for Direct Public Sector

RRI Regions	SUBSYSTEMS								SYSTEM	
RRI Regions	COST No of cases	%	TIME No of Cases	%	QUALITY No of Cases	%	Material No of Cases	%	No of cases	%
[20–39] Low	0	09.5	1	8.7	3	10	2	9	0	5.4
[40-59] Region	12		12		11	28	19%		5	
[60-79] Medium	50	40	54	36.4	57	40	43	51%	54	47.1
80 & above	36	26.2	48	38.1	38	50	30	30%	41	46.5

Source: Authors Field Work, 2007 – 2008.

Table 7 RRI Distribution of Respondents Scores for Private Sector (Direct)

RRI Regions	SUBSYSTEMS								SYSTEM	
RRI Regions	COST No of cases	%	TIME No of Cases	%	QUALITY No of Cases	%	MATERIAL No of Cases	%	No of cases	%
[20–39] Low	1		2		6		5		2	6.4
[40-59] Region	30	29.7	34	31.6	28	19.0	19	21	22	19.0
[60-79] Medium	44	40.1	45	40.7	48	46.0	44	53	65	50.8
80 & above	35	285.2	46	25.7	34	35.0	39	32	38	30.2

Source: Author's Field Work, 2007 – 2008.

Conclusion

Construction sector is seen as the pivot on which every other activity in the economy rotates. The significant importance of this sector is evidenced in the fact that every business or services of diverse kinds must have an address, a location in the environment which must be constructed. Therefore, any effort towards reducing or eliminating the noticeable and silent constrains that directly or indirectly affect project management success in this sector is a right step in the right direction. Most of the constraining factors from the environment in the public sector came as a result of the systems inefficiency in employing incompetent personnel, consultants and contractors to handle projects without thorough scope definition of projects and clear definition of objectives of the project in terms of cost, time, quality and materials targets.

Recommendations

This study strongly recommends that competent professionals should man the various ministries of works and be given free-hand to perform. Attempt must be made to divorce political issues from purely technical and managerial issues involved in construction project management success. Clients in the public sector especially, should not commission projects that did not spring out of a thorough and well articulated quantitative appraisal. Funding such will be seen as a colossal waste of resources or an elephant project.

The conception stage which houses the design should handle subsequent problem of thorough scope definition of project details before or after the commencement of site works. The managerial functions of a project manager should be separated from the technical functions of the design team. A project manager should be appointed early enough in the project life cycle to handle the management from inception to completion. This project manager, in conjunction with the design team members should define the scope of the works in detail in terms of what the construction project will cost. Clients should insist that modern project management planning and control techniques should be used as a method of achieving the required targeted quality in project implementation and execution process.

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