

EVALUATING THE EFFECTS OF ORGANIZATIONAL STRUCTURE ON THE EFFECTIVE DELIVERY OF CIVIL ENGINEERING PROJECTS

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ABSTRACT

This study examines the effects of organizational structure on the Effective Delivery of Civil Engineering Project (EDCEP) in the Niger Delta Region of Nigeria (NDRN). Successful project management, regardless of the type of organizational structure, is as good as individuals and leaders who are managing the key functions and dedicated to the achievement of specific goals. The data for the study was sourced primarily from a sample of ten civil engineering construction firms operating in the NDRN. The primary data used was captured and measured using the instrument of questionnaire modelled in Likert five point scales. The analytical tools used in the analyses of data were multiple regression and correlation analyses as well as multiple comparison test using Friedman statistic. The results of the analyses infer that EDCEP requires skilled experts and workers who are dedicated to optimal job performance so as to achieve set objectives. The variables within the organizational structure that contributed significantly to the EDCEP in the NDRN were found and ranked in their order of significance. The study also established that, there is no significant difference in the mean effectiveness of organizational structures on the EDCEP. Recommendations were made for the institution of periodic manpower development and principles of management by objectives in order to accommodate the views of subordinates (doers) in goal setting.

Keywords: *Organizational structures, span of control, adaptiveness, power and authority, accountability, effective delivery, civil engineering projects.*

INTRODUCTION

Organizational structure is the management framework adopted to oversee the various activities of a construction project or other activities of an organization. A suitable organizational structure assists the project management team to achieve high performance in the project through gains in efficiency and effectiveness. Civil engineering projects in the NDRN require efficient and effective organizational structure in order to successfully accomplish various challenging tasks associated with rugged geographical terrain, environmental unfriendliness and complexity in the structural designs of the project.

Many companies have employed a wide range of structural options in dealing with the increased complications, uncertainties and interdependence that accompany effective completion and delivery of jobs/projects undertaken. Hence, understanding the company's structure will provide a greater insight into effective delivery of civil engineering projects especially in environmental constrained locations such as NDRN. A typical organisational structure should therefore outlines lines of authority, responsibility, communication and defines status and roles within the organisation. It should be noted that an organisation is all about people and should therefore be people oriented. Many construction/civil engineering projects come under and are administered in the separate team environment. They are

mostly public works construction project henceforth called "programmes". The effectiveness of different organizational approaches in practical applications for these programmes is crucial because the type of organizational structure effects heavily on every project delivery.

Civil engineering projects are projects of special nature and as such fall under projects that deserve effective organization structure. This is because the organization puts the manager with specific technical experience in a direct reporting relationship to the programme director. On account of special nature of civil engineering and construction projects, and bearing in mind Nigeria's peculiar case (of incessant project abandonment), the researcher thought it wise to look at the influence of organizational structure on the effective delivery of civil engineering projects. According to Akpan and Chizea (2002), organizing is a major function of management. It entails the setting up, and equipping of appropriate organizational system, completed with operational procedures and guidelines with people assembled together with the sole aim of realizing a pre-determined objectives. For effectiveness, all within the system should know the purpose for which organizational was established as well as their individual purpose and value within it. One of the avenues for facilitating this is the organizational framework or structure. It is the responsibility of management at the highest level of authority to articulate long term corporate objectives, and simultaneously fashion out an organizational structure best suited to the attainment of such goals. A well structured system has the potential of being able to or at least reduces to the barest minimum, confusion, indecision, back-passing, duplicated efforts and neglected duties inherent in human associations. It should be able to show clearly who is responsible to whom and who has authority over whom. It offers management with the mode through which it could coordinate, monitor and control all that go within the organization. Akpan and Chizea (2002) further posit that for the organizational structure to be effective and efficient, it has to possess the following:-

- ❖ Flexibility, that is amenable to change as situations change. It should give allowance for optimum delegation and room for individual creativity.
- ❖ Simplicity; simple to the extent that no one is in doubt what is expected of him.
- ❖ Lean staff; the top level management should be as lean staffed as is needed for prompt decision making.
- ❖ Optimal span of control; the middle level management, the supervisors inclusive should not be cumbered with so many people under their direct control. At the same time, the span of control should not ridiculously be too small to miniaturise their role and importance within the structure.
- ❖ Human-oriented; the structure should be seen to enhance humanism, job fulfilment and enhancement. It should be people-oriented and responsive to the environment that gives it the shelter.

- ❖ Result and Quality-oriented; the structure should indicate without any doubt that it is result and accountability oriented.

To achieve project success, a project management team is required to attain high performance in order to overcome the flooded construction market environment and the different peculiarities of different projects which are diverse and complex. (Yinghui and Cheng Eng. 2004).

The site organization structure is the management framework adopted to oversee the various activities of construction work. A suitable site organizational structure assists the project management team to achieve high performance in the project through gains in efficiency and effectiveness. A study carried out by Yinghui and Cheng Eng. (2004) on the "impact of organizational structure on project performance" were limited to site organizational structure, with the following objectives.

- (a) To determine the basis of using certain organization structures in construction projects by using prevalent theories of structures to test their validity.
- (b) To examine the relationships between the characteristics of a construction project and the features of its site organizational structure; and
- (c) To provide a guide for the project manager to establish and fine-tune a site organization structure to fit the requirements of different project characteristics.

This study therefore considers it necessary to carry out a comprehensive analysis of organizational structure in order to ascertain the effects of various variables in the structure on the effective delivery of civil engineering projects in the NDRN.

The NDRN is characterised by serious environmental challenges such as rugged geographical terrain, high project risk, swampy terrain, thick forest etc. which are the bane of project success. Project failures are too rampant in this region because the environmental challenges impose serious constraints to the performance of project team members, project managers and other stakeholders that constitute the organizational structure necessary for the effective delivery of civil engineering projects that abound in the region. Also, the failure of civil engineering projects in the NDRN could be attributed to the fact that many organizational structures of the contracting firms are inefficient and ineffective, poorly designed and constituted, lacks the requisite skilled manpower and necessary competent personnel at different strata in their composition. As a result, the effects of the organizational structure on the effective delivery of these engineering projects are not thoroughly ascertained and evaluated due to these problems. Lock (1996) avers that civil engineering projects incur special risks and problems of organizational and communication due to amount of finance and resources, and participation of several contractors, working in some kind of joint venture. Civil engineering and construction projects are categorized by Chitkara

(2006) as; building construction, infrastructure construction, industrial construction and special purpose projects.

Field survey indicates that difficult environmental characteristics make it impossible for performance measurement of integrated work functions and tasks due to the composition of the structure which usually lack operational procedures and guideline. It has been argued in some quarters that organizational structures of many civil engineering contracting firms in the region are not proactive to effective project delivery because they fail to properly explore the need to outline and specify the lines of authority, responsibility and communication. They hardly define status and roles appropriately and explicitly within the organization and these usually result to project conflicts, which have been marring effective delivery of civil engineering projects in the NDRN. The management of the civil engineering contracting firms are either not aware of these latent dangers or are unable to address the effects of these variables in organizational structures on the effective delivery of projects. An in-depth critical appraisal of the performance of civil engineering projects in NDRN indicated that many civil engineering projects suffer time and cost overrun as well as low quality output and abandonment.

The objectives of the study therefore include:

- ❖ To investigate the influence of organizational structure on the effective delivery of civil engineering projects with a view to: eliminating or reducing confusion, indecision, back passing and neglected duties, so as to ensure effective project delivery of civil engineering projects. The study is intended to provide a decision support system and framework that will consider input variables and help in designing a befitting and result oriented organizational structure capable of achieving the expected performance objective of civil engineering projects in the NDRN.
- ❖ To identify the variables of organizational structure that enhances EDCEP and develop a predictive model that would be used for decision making.
- ❖ To determine the effects of various variables of organizational structure on the EDCEP in the NDRN, collectively and individually.
- ❖ To ascertain the effectiveness of organizational structures for the successful implementation and delivery of civil engineering projects in the NDRN.
- ❖ To answering crucial questions on the choice of the right organizational structure for EDCEP in the NDRN.

The following research hypotheses were therefore formulated and tested for validity.

H₀₁: The aggregate and individual effects of functional variables in organizational structure on the EDCEP in the NDRN are not significant.

H₀₂: There is no significant difference in the mean effectiveness of organizational structures on the successful delivery of civil engineering projects in the NDRN.

The study will provide the project managers with apt knowledge and right decision process in designing or redesigning organizational structures for enhanced

job performance. The study covered and is limited to some selected civil engineering projects in the NDRN. The major characteristics and indicators of efficiency and effectiveness of organizational structure were examined and analysed in relation to performance parameters of effective project delivery such as scheduled completion at budgeted cost and quality/design specifications.

LITERATURE REVIEW

Many researches have been conducted in the areas of organizational structure and/in Project Management, and still, research gap exists. No such research has been conducted with respect to project delivery in a challenging environmental aggressiveness with implementation constraints and rugged geographical terrain NDRN is characterized by these limitation and therefore, the effects of organizational structure on the performance objective of civil engineering projects in the NDRN is considered necessary. Also the bodies of knowledge that currently dominate the project management profession are primarily practice driven, lack a robust theoretical foundation, recommend a one-size fits-all approach and adopts a project level rather than a organizational level (The University of Sydney (2009). It could be on this premise that Merve (2001) made an attempt to find the application and integration of strategy, structure processes and projects in order to facilitate the development of a business. However, the effects of various operating characteristics and variables of an organizational structure on the EDCEP have not been properly examined and brought to focus.

Companies have employed a wide range of structural options in dealing with the increased complexity, uncertainty and interdependence that accompany and pre-suppose the EDCEP. The organizational structure of a company can have a large impact on the ability to manage a project. (Oberlender 2000). Unfortunately, many firms do not realized the necessity for organizational change until it is too late. Kerzner (2004) observes that management has come to realize that organizations must be dynamic in nature, i.e. they must be capable of rapid structuring should environmental conditions dictates. Wallace (2007) identifies that the way a project team is structured can play a major role in how it functions. Careful consideration of team composition and reporting relationship can make a big different to the result. He points out that team structure will probably be adjusted at each stage to meet the evolving nature of the project. Building a good/effective team and a vital team structure will influence the way the team behaves. Wallace (2007) suggests four major factors which caused onset of organizational revolutions as; the technology, competition and profit squeeze, high cost of marketing and unpredictability of consumer demands. Akpan and Chizea (2002) have noted three types of organizational structure as functional, product/project and matrix. However, there are often real and important conflicts between the types of organizational structure that is called for if the tasks are to be achieved with minimum cost and the structure; as that will be required if the human beings are to have their needs satisfied into mechanistic and organic

organizational structures. According to Burns (1961), mechanistic structure emphasizes the importance of achieving high level of production through the use of formal procedures, centralized authority, direct supervision and specialized labour. In such companies, coordination and problem resolution occur at high levels of the hierarchy. In contrast with companies with control-oriented mechanistic structure, are those with flexibility-oriented value system, which is the organic structure. Organizations with flexibility-oriented value systems attempt to decentralize decision-making. In such organizations, problems are resolved at the point at which they occur, and subunits are based on work-flow and process instead of functions. Organic structure can be effective when management attitude and value are facilitated. Zimmuto and Krakower (1991) empirically establish that inflexible value systems are correlated with mechanistic structures and flexible value systems are correlated with organic structures. Both mechanistic and organic structures use different mechanisms to influence organizational performance. The appropriate managerial attitudes and cultural values are necessary for the effectiveness of both mechanistic and organic structures. Neither of them can work effectively and achieve the desire result without the right managerial attitudes and appropriate cultural values.

Civil engineering and construction activities share almost the same concepts and some similar characteristics in practice. Civil engineering is the design, building and repair of roads, bridges, canals, houses etc. In a similar definition, construction (of roads/buildings) is the process or method of building or making something especially roads, bridges etc. Chitakara (2006) observes that in the present day world, technical breakthroughs have revolutionized construction activity. He adds that modern construction areas include high-rise buildings, dams and irrigation networks, energy conversion and industrial plants, environmental protection works, infrastructural facilities like roads, bridges, railways, airports and seaports, satellite launching stations, onshore and offshore oil terminal etc. Construction activity contributes to the economic development of any nation. Construction is an employment spinner more than most of the sectors generate. The developed countries have dominated the construction of power and process plants, which require a high degree of sophisticated technology, while the developing countries like South Korea and India have concentrated more on the repetitive and routine types of works like building construction. According Lock (1996) civil engineering, construction, petrochemical, mining and quarrying projects, which have in common the fact that the fulfilment phase must be conducted on a site, which is exposed to the elements, remote from the contractors head office. They often require massive capital investment, and they deserve (but do no always get) rigorous management of progress, finance and quality. These projects, incur special risk and problems of organization and communication. The amount of finance and other resources in such project may be too great for one contractor to invest, in which case the organizational and communication are further complicated.

METHODOLOGY

The survey method of research design, and area and judgmental sampling techniques were adopted in the study. The data used for the study was obtained through primary source. A well structured and standardized questionnaire which was modelled in Likert five point scale was used as the instrument of data collection and measure. The questionnaire captured the expert opinions intuitive judgement and perception in 10 civil engineering projects operating in the NDRN. A total of 164 (82%) questionnaires were returned out of 200 copies distributed and allocated to the target respondents. The methods of data analyses were multiple regression analysis and multiple comparison (Friedman) tests.

The NDRN was selected because of the on-going many civil engineering projects in the region. Because of vast deposit of oil and gas in the region, there are many economic activities and civil engineering works to facilitate the exploration, exploitation and production of oil and gas as well as to provide necessary infrastructures to the densely populated region. The statistical hypothesis were tested at 5% level of significance

The constructs variables of the organizational structures that are used in model specifications and data analysis were extracted from Akpan and Chizea (2002) and Yinghui and Cheng Eng (2004) as follow:

- x_1 = Span of control
- x_2 = Level of flexibility
- x_3 = Calibre of supervisors/level of lean staffing
- x_4 = Number of division/department
- x_5 = Levels of Power/authority and communication flow
- x_6 = Accountability and quality oriented indices
- x_7 = Level of simplicity
- y = Level of Effective Delivery of Civil Engineering Project (EDCEP) in the Niger Delta Region of Nigeria (NDRN).

x_1, x_2, \dots, x_7 are the independent variables while y = dependent variable. Also, types of organization structure area:

- S_1 = Functional organizational structure
- S_2 = Product/project organizational structure
- S_3 = Matrix organizational structure.

The data analyses were done with the help of Statistical Package for Social Sciences (SPSS) computer software. The research hypotheses were test at 5% level of significance α . The decision rule is that if p-value is more than level of significance α H_0 is therefore rejected in favour of H_A and vice versa.

Table 1: Descriptive Statistics for the Effects of Organizational Structure (EOS) on EDCEP.

	Mean	Std. Deviation	N
Level EDCEP Y	50.62	10.333	164
Span of Control X ₁	14.23	4.221	164
Level of Flexibility X ₂	13.65	4.559	164
Calibre of Supervisors/level of lean staffing X ₃	14.49	3.355	164
No. of Divisions/Supervisors X ₄	13.90	3.776	164
Levels of Power/Authority & Communication X ₅	13.29	5.156	164
Accountability & Quality Oriented indices X ₆	14.81	3.365	164
Level of Simplicity X ₇	14.82	3.803	164

The correlation matrix in table 2 exhibits no problem of multi-co-linearity and therefore accepted as being worthy of introduction into the regression analysis model.

Table 2: Correlations Matrix of Effects of Organizational Structure (EOS) on EDCEP

	Y	X ₁	X ₂	X ₃	X ₄	X ₅	X ₆	X ₇	
Pearson Correlation	Y	1.000	.115	.227	.297	.023	.191	.302	.096
	X ₁	.115	1.000	.492	.242	.255	.264	.509	.161
	X ₂	.227	.492	1.00	.170	.126	.202	.303	.219
	X ₃	.297	.242	.170	1.000	.012	.053	.551	.012
	X ₄	.023	.255	.126	.012	1.000	.071	.119	.288
	X ₅	.191	.264	.202	.053	.071	1.000	.151	.121
	X ₆	.302	.509	.303	.551	.119	.151	1.000	.191
	X ₇	.096	.161	.219	.012	.288	.121	.191	1.000
Sig. (1-tailed)	Y		.070	.002	.000	.385	.007	.000	.111
	X ₁	.070		.000	.001	.000	.000	.000	.019
	X ₂	.002	.000		.015	.055	.005	.000	.002
	X ₃	.000	.001	.015		.439	.252	.000	.439
	X ₄	.385	.000	.055	.439		.182	.065	.000
	X ₅	.007	.000	.005	.252	.182		.027	.061
	X ₆	.000	.000	.000	.000	.065	.027		.007
	X ₇	.111	.019	.002	.439	.000	.061	.007	
N	X ₇					164			164

Table 3 shows the model summary which indicated that the correlation coefficient $R = 0.412$ (41.2%) and coefficient of determination $R^2 = 0.170$ (17.0%). These show that the strength of relationship between the variables in organizational structures and level of EDCEP in NDRN though reasonable, but not very significant. Also, the percentage or proportion of factors or variables accounted for by the regression or relationship equation is low (17%). It could be that not all the variables in the organizational structure contributed to the EDCEP in the NDRN.

Table 3: Model Summary of EOS on EDCEP

Model	R	R Square	Adjusted R Square	St. Error of the Estimate
1	.412	.170	.133	9.624

- a. Predictors: (Constant), Level of Simplicity, Calibre so Supervisors/Lean Staff, Levels of Supervision authority & Communication, No. of Divisions/Department, Level of Flexibility, Span of Control, Accountability & Quality Oriented Indices.

Table 4: ANOVA^b of EOS on EDCEP

Model	Sum of Squares	df	Means Square	F	Sig.
1. Regression	2954.841	7	422.120	4.557	.000 ^a
2. Residual	14449.720	156	92.626		
3. Total	174040.561	163			

- a. Predictors: (Constant), Level of Simplicity, Calibre so Supervisors/Lean Staffing, Levels of Power/authority & Communication, No. of Divisions/Department, Level of Flexibility, Span of Control, Accountability & Quality Oriented Indices.
- b. Dependent Variable: Level of Effectiveness in the Delivery of Civil Engineering.

Table 5: Coefficients of EOS on EDCEP

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1. (Constant)	28.283	5.153		5.489	.000
X ₁ = Span of Control	.403	.237	-.164	-1.701	.091
X ₂ = Level of Flexibility	.405	.194	.179	2.091	.038
X ₃ = Calibre of Supervisors/Level of lean staffing	.575	.272	.187	2.115	.036
X ₄ = No of Divisions/Department	-.004	.214	-.002	-.020	.984
X ₅ = Levels of power/authority & communication	.312	.153	.156	2.046	.042
X ₆ = Accountability & Quality oriented indices	.618	.307	.201	2.009	.046
X ₇ = Level of Simplicity	.066	.214	.024	.306	.760

The regression or relationship model was deduced from table 4.7 as follows:

$$y = 28.283 - 0.403X_1 + 0.405X_2 + 0.575X_3 - 0.004X_4 + 0.312X_5 + 0.618X_6 + 0.066X_7 \dots \dots \dots 1$$

MULTIPLE COMPARISON TEST

Table 6: Descriptive Statistics for Multiple Comparison Test

	N	Mean	Std. Deviation	Minimum	maximum
Matrix organization structure	164	14.39	4.146	5	21
Product/Project organizational structure	164	14.31	3.504	5	21
Functional organizational structure	164	13.99	3.764	5	24

Friedman Test

Table 7: Friedman test ranking of the mean effectiveness of different organizational structures

	Mean Rank
Matrix organizational structure	2.03
Product/Project organizational structure	2.02
Functional organizational structure	1.95

Table 8: Test Statistics^a for multiple comparison test

N	164
Chi-Square	.572
df	2.02
Asymp. Sig.	1.95

a. Friedman Test.

RESULT AND DISCUSSION

The results of the hypotheses testing at $\alpha = 0.05$ show that the collective effects of all the independent variables on the EDCEP is significant as shown in table 4. Also, table 5 indicates that the t-tests on the individual variables $x_3, x_2, x_5,$ and x_6 are significant while x_1, x_2 and x_7 are not significant.

One of the first requirements of the project start-up could be to develop the organizational structure and chart for the project and determines their relationship to the parent organizational structure. In most project oriented companies, the impact of management emphasis on the organizational structure due to leadership is well known. The leadership emphasis is best seen by employee contributions, organizational order, employee performance, and the project managers' performance. Successful or effective project delivery is a function of the individuals and leaders who are managing the key functions in the organizations as well as how splendid is the structure. Many variables within the organizational structure are the attributes of the individuals character and behaviours of their leaders. The organization is best viewed as the pattern of interactions and relationship among its members. Organizing can make these interactions and relationships more effective in project management by; reducing conflicts, defining roles, planning or scheduling and producing a blueprint of these relationships. Therefore, the relationships, activities, objectives and communication flow necessary for EDCEP in the NDRN are usually structured by the project managers.

The results of the analyses showed that the fitted predictive regression/relationship model of the variables in the organizational structure on the index of EDCEP in the NDRN is given as:

$$y = 28.283 - 0.403x_1 + 0.405x_2 + 0.575x_3 - 0.004x_4 + 0.312x_5 + 0.618x_6 + 0.066x_7.$$

The various factors or independent variables in the organizational structure and their effects on the EDCEP in the NDRN are ranked in table 9 as follow based on the deduction from table 5. The test on the variables x_3 , x_2 , x_5 , and x_6 , were significant, while x_1 , x_7 , and x_4 , were found to be insignificant to EDCEP in NDRN.

Table 9: Ranking of variables for EOS on EDCEP.

Variable	E-value	P-value (Sig)	Rank
Span of control, X_1	- 1.701	0.091	5th
Level of flexibility, X_2	2.091	0.038	2nd
Calibre of Supervisors/Level of Lean staffing, X_3	2.115	0.036	1st
Number of divisions and departments, X_4	- 0.021	0.984	7th
Levels of power/authority and communication, flow X_5	2.046	0.042	3rd
Accountability and quality oriented indices, X_6	2.009	0.046	4th
Level of simplicity, X_7	0.306	0.760	6th

Calibre of supervisor/level of lean staffing X_3 ranks first. Simple structures which are apt in practice usually require a small, lean staff at the corporate and middle management level. Mochal (2003) infers that the differences in the project management success rates may be as a result of the fact that some organizations do a better job of training their project managers so that they could be more skilled and knowledgeable in the project management discipline. Flexibility x_2 ranks second and could be on the premise that civil engineering companies operating in an unstable rugged and difficult environment like NDRN should be adaptable and flexible to changes. The structure of the organization needs to be organic in their value system. That could be the reason why Gibon et al (1979) assert that; to the extend that organization cannot or does not adapt; its survival is in jeopardy. Level of authority/power and communication flow, x_5 ranks third. The project managers should be given high level of authority, which is the legal or rightful power to command, act or direct the activities of subordinates in project organization. Hicks and Gullet (1981) confirm that information is one of the essential elements necessary for a manager to exercise authority and power. The level of accountability and quality oriented index x_6 ranks fourth as significant factors of EDCEP in NDRN. Accountability comes into being because the managers has a right to require an accounting for the authority and power delegated and tasks assigned to the subordinate. Accountability process brings about quality performance. Hicks and Gullet (1981) further confirms that the reluctant to be responsible and accountable to someone is undoubtedly the cause of much organizational ineffectiveness and friction. However, the span of control x_1 , number of division/department, x_4 and level of simplicity x_7 do not make significant contribution to the EDCEP in the NDRN. The study further indicates that, there is no significant different in the mean effectiveness of different types of organization structure in the delivery of civil engineering projects in the NDRN. What matter most for EDCEP in

the NDRN is the power and authority, communication flow, calibre of manpower and flexibility for optimal job performance. Therefore, the hypotheses test results are as follow. For H_{01} ; F-test is significant for all the independent variables, and t-tests for x_3 , x_2 , x_5 , and x_6 , are significant, while x_1 , x_7 , and x_4 , are not significant. The H_{02} for multiple comparison test for different organizational structures is not significant.

CONCLUSION

The estimation models developed in this study will help the decision makers in arriving at appropriate conclusion when designing an organizational structure to address some of the challenges and problems encountered in managing projects within the NDRN. The model would also allow the incorporation of interactive inputs by experts and executives from related functional areas in the project organization and helps to make objective decisions. What matters most are the calibre of manpower, levels of authority and power, and information flow as well as adaptiveness in the EDCEP in the NDRN and not the types of organizational structure being put in place. The results of this study therefore could be integrated into a decision support framework that would help to design a befitting organizational structure for the EDCEP in the NDRN. Therefore by identifying, grouping and sharing the work to be done and skills required through structuring, the project organizations can achieve their objectives of effective delivery of civil engineering projects in the NDRN. Also, by assigning power/authority to direct the affairs of the work with sufficient flow of information and adaptiveness to changes, realization of EDCEP will be fruitful. Recommendations were proffered for special training and manpower development to get the right calibre of manpower required for project success and robust organizational structure for EDCEP in the NDRN. Also, Free flow of communication, flexibility and apt orientation on quality consciousness and accountability should be given top priority in designing suitable organizational structure.

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