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FACTORS AFFECTING THE CHOICE OF PROJECT SCOPE MANAGEMENT PRACTICES AMONG TELECOMMUNICATION ORGANIZATIONS

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Factors Affecting the Choice of Project Scope Management Practices among Telecommunication Organizations

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In conclusion, the study revealed that Competitive advantage, Complex project scope statement, client's demand and Return on Investment are critical factors that can influence the choice of project scope management practices in the telecommunication organizations.

Keywords: project scope, management practices, choice, telecommunication, organizations.

I. INTRODUCTION

As business needs change, Information and Communications Technology (ICT) develops in line with these changes especially in the present age of increased awareness and need. Organizations that maximize the use of new technologies found

themselves dealing with projects that are difficult and expensive to implement (Ojiako et al., 2005). These projects are however embarked upon in order to meet up with several requirements. These include: contributing to organizations strategic plan, (its mission, goals and objectives), meeting up with executive sponsor requirements, technological advancement, legal requirements, commercial goals, political concerns, Government regulations, Nation building among others.

However, in order to ensure that these projects are implemented and delivered to the expectations of stakeholders, project management is embraced, especially in telecommunication industry, to proactively manage these projects such that the expected outcomes (products or services) will fulfill the purpose upon which they are embarked upon. Embracing project management to manage projects go a long way in improving upon project delivery success especially among ICT projects implemented by telecommunication organizations. However, the application of project management to manage projects are also governed by the methodologies applied but the objective remains the same, that is, improve upon project success and meet up with set project objective, goal and success criteria.

Several organizations face challenges in implementing these projects to desired expectations and these challenges do stem from improper gathering, interpretation and documentation of requirements and defining the boundary (scope) needed to fulfill project objectives. Significant efforts have been made in the identification, application and management of procedures, practices, processes, standards and methodologies towards ensuring that project requirements and scope are properly analyzed and documented to aid project delivery and success (Pmbok, 2013).

Project scope management is applied basically to aid the management of projects to success including ICT projects embarked upon by Telecommunication organizations. It involves all the practices that will aid in ensuring that all the work and only the work that are required are done on the project work. Project scope management involves planning, gathering requirements, creation of work breakdown structure, verifying and controlling project scope (Pmbok, 2013). It is noteworthy

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that organizations decide on the choice of project scope management practices that they will embark upon and several factors can be responsible for the choice of project scope management practices they will employ in implementing projects. These factors can combine to influence the choice of practices the organization will employ to manage projects individually or translate to organization standards for managing all projects. The primary objective of organizations is achieving project success and reducing failures especially in a competitive environment. With the increasing competition and dynamism in the ICT industry and also the need to improve upon cost savings and maximize profits, effective project scope management is the most important factor that affects project success or failure (Avison and Torkzadeh, 2009).

II. LITERATURE REVIEW

Information and Communication Technology (ICT) is technology that supports activities involving the creation, storage, manipulation and communication of information, together with the related methods, management and application. In other words, Information Technology enables the easy way to record, store, process, retrieve, and transmit information (Robert and Murphy, 2010). It encompasses modern technologies such as computers, telecommunications, facsimile and microelectronics. Older technologies such as document filling systems, mechanical accounting machines, printing and cave drawings are also included in the term Information Technology.

Emerging trends in socio-economic growth shows a high premium being placed on information and communication technology (ICT) by homes, organizations, and nations. This is fast making the world to become a global village and the necessary tool for this process is communication of which tele-communication is a key player. Projects implementation in the telecommunications sector all over the world is very rapid as one innovation replaces another in a matter of weeks (Ajiboye *et al.*, 2007). Communication without doubt is a major driver of any economy. This introduction has brought about a revolution in the telecommunication sector services worldwide.

Investments in ICT projects and training by telecommunication organizations have not totally led to massive gains in corporate productivity and ultimately improvement upon nations gross domestic product (GDP). The delivery of ICT projects among telecommunication organizations specifically, is failing to meet business and user needs due to factors such as poorly defined scope, cost and time overruns, inadequate quality and meeting up with expected features and functions to satisfy project stakeholders (CIO Magazine, 2001). Chaos manifesto, 2012 revealed that 39% of all projects (ICT projects inclusive)

implemented in 2013 were successful (delivered to time, on budget and with required features and functions), 43% were challenged (late, over budget with unsatisfactory required features and functions) and 18% failed (cancelled prior completion or delivered and never used). However, an increase in project success was observed over the years and this was as a result of several factors such as methods, skills, costs, tools. Decisions, internal and external influences, team bonding, technology and paramount amongst these is the increased awareness and introduction of project management especially in the various stage of project implementation including project scope management practices needed for ICT projects implementation (Heeks, 2002).

The introduction of project management into managing ICT projects comes with diverse methodologies. Project management methodologies specify the best way to initiate, plan, execute, control and deploy projects to achieve set objectives including customer satisfaction. There are several methodologies and the most suitable for projects implementation are determined by considerations such as the industry, sector or project type. Whichever methodology is considered or selected, they all also describe the approach for project scope management practices that can be employed to accomplish project objectives. Some of the methodologies in place includes; Waterfall, Agile, critical chain, critical path, scrum, PRINCE2, Project Management Institute (Varner, 2014). The Project Management Institute (PMI) methodology approaches project by classifying project implementation into process groups (Initiating phase, Planning phase, Executing phase, Monitoring and Controlling phase and Closing phase), knowledge areas and processes. Project scope management is a knowledge area that has plan scope, collect requirements, define scope, create work breakdown structure (WBS), verify scope and control scope as it processes (PMBOK, 2013). These processes are the practices employed in project scope management of projects including ICT projects implementation by telecommunication organizations.

Project scope management includes all those practices that are necessary to ensure that the project is streamlined to only the required necessary work in order to achieve a necessary product, service or result. Scope means what is needed to be done and scope management is the managing of what needs to be done (Wysocki, 2009). A well defined project scope is important for effective allocation of resources, plan expenditures, save time and energy by eliminating and or reducing features that have little value to project objectives. However, the process of defining scope can result in problems of the extreme if not well managed. Project definitions that are too broad may lead a team into a morass of connecting issues and associated problems beyond the team's resources. Project scopes

that are set too narrow could restrict teams from finding root causes. The tendency is to err on the side of making the scope too broad rather than too narrow (Mulcahy, 2009).

According to the PMI methodology, project scope management constitute the processes needed to ensure that the project includes all of the work required and only the work required to complete the project implementation successfully (Pmbok, 2013). There are five fundamental practices relating to project scope management (Heldman, 2009). These include:

III. COLLECT REQUIREMENTS

This is the practice whereby the customers and stakeholders expectation of the project is recorded. The captured information must be elicited and analyzed in concrete detail. Requirement becomes the foundation of the work to be done and serves as a guide to the cost, schedule, the quality and customer satisfaction baseline of the project (Mulcahy, 2009).

a) Define Scope

Define scope is the practice of implementing a detailed documentation and description of the project and product. The product scope describes the features and characteristics of the product, result or service of the project while project scope describes the project work required to create the project deliverables (Heldman, 2009). Project scope definition is primarily concerned with what is and is not included in the project to be implemented. Define scope process usually qualifies major deliverables assumptions and initial constraints documented during the project initiation stage or phase.

b) Create work breakdown structure (WBS)

This is a project scope management practice of subdividing the project goals and deliverables and work to be done into smaller, more manageable units. Creation of the WBS requires the scope statement, requirement documentation and organizational culture, practices and procedures. The method used to breakdown and subdivide task and deliverables into smaller units is known as decomposition. The result of this process is the WBS, which effectively divides goals and tasks by setting milestones, cost estimates schedule activities among others (Pmbok, 2013).

c) Verify Scope

Scope verification involves the official acceptance of the completed project scope by the customer or stakeholders (Schwalbe, 2011). This process is involved with formalizing the acceptance of the project deliverables. Reviews are made with the customer concerning deliverables and the sponsor to ensure that the scope is in line with the initial goals of the sponsor. Several documents may be used to achieve this process including project management

plan, requirements documentation and validated deliverables. The main method of achieving this process is by review and inspection.

d) Control Scope

This is the process of monitoring and controlling the status of the project and product scope. Control is used to monitor the actual changes as they occur and integrated into the change control process. Controlling scope is a challenge to many ICT projects (Schwalbe, 2007). A reliable system must be in place to track, monitor, manage, and review change to project scope. Controlling scope changes must focus on; determining if a scope change is required; facilitating scope changes to ensure that changes are agreed upon; and managing the changes if they happen. Throughout a project life cycle, the need for change will arise from project stakeholders however, it is essential for project team members to proactively analyst, review and subject such changes to due approval processes before implementation. This is achieved by having a change control system in place. The change control system, handled by the project steering committee or change control board, is a process that estimates the impact of the change on project scope and determines if the change will be accepted or rejected (Luckey and Phillips, 2006).

IV. RESEARCH METHODOLOGY

The study covered two states of the Southwest geopolitical zone of Nigeria namely Lagos, and Oyo states. The states have the largest concentrations of the telecommunication headquarters in Nigeria (NCC operators' data, 2013) containing details of all existing telecommunication firms in Nigeria. Twenty five telecommunication firms in Nigeria were visited which consisted of five (5) Global Systems for Mobile Communications (GSM) firms; four (4) Code Division Multiple Access (CDMA) firms and sixteen (16) fixed/fixed wireless firms. The ultimate goal was to establish the effect of project scope management practices on projects implemented by telecommunication organizations.

A set of questionnaire was designed and administered to a total number of 375 respondents comprising 125 project sponsors, project managers/coordinators, and project team members respectively. It elicits information on the factors influencing the choice of project scope management practices among telecommunication organizations. These factors include: competitive advantage, organizational process assets, expert judgment, complex activity list, complex project scope statement, limited resources, fast tracking, project delays, client's demand, technical skill required, dynamism of technology and return on investment. The data gathered were treated and subjected to analysis using descriptive and appropriate inferential statistics.

Inferential statistics such as correlation, Analysis of Variance (ANOVA) were used to examine the factors influencing the choice of project scope management practices on ICT projects implemented by telecommunication organizations.

V. RESULTS AND DISCUSSION

a) *Scope Management Practices Employed on Projects among Telecommunication Firms*

Table 1 presents the detailed analyses of the scope management practices employed on projects among telecommunication organizations. According to

Table 1 : Scope Management Practices Employed on Projects among Telecommunication Firms

Parameters	5	4	3	2	1	Mean rank	SD
Collect Requirements	24 (25.5)	50 (53.2)	20 (21.3)	-	-	1.95	.68
Define Project Scope	23 (23.5)	48 (51.1)	23 (24.5)	-	-	4.00	.70
Create Work Breakdown Structure	27 (28.7)	47 (50.0)	20 (21.3)	-	-	4.07	.70
Verify Scope	7 (7.4)	63 (67.0)	24 (25.5)	-	-	3.81	.54
Control Scope	7 (7.4)	54 (57.4)	33 (35.1)	-	-	3.72	.59

Source: Field Survey (2014).

KEY: 1 = Not satisfactory, 2 = Slightly satisfactory, 3 = Moderately satisfactory, 4 = Satisfactory, 5 = Very satisfactory, N = 94

b) *Factors Influencing the Choice of Project Scope Management Practices among Telecommunication Firms*

As shown in Table 2 the highest (58.5%) proportion of the respondents agreed that competitive advantage is a significant factor that affects the choice of project scope management practices employed in the organizations. Also, Organizational Process Assets was agreed to be slightly significant (38.7%) and moderately significant (21.7%) to the choice of project scope management practices employed in the organizations, Expert judgment was also agreed to be slightly significant (41.5%) and moderately significant (45.3%) to the choice of project scope management practices employed in the organizations. It was also revealed that the highest percentage of the respondents (85.8%) agreed that Complex Project scope statement is a significant factor that affects the choice of project scope management practices employed in the organizations.

the mean rank shown in the result, the major scope management practices employed by the organizations were; Define Project Scope (4.00), Create Work Breakdown Structure (4.07), Verify Scope (3.81) and Control Scope (3.72). All these factors had the mean rank of 3.5 and above. The result also showed that, among the five scope management practices employed by the firms, only Collect Requirement had a very low mean rank of 1.95. The reason for this may be the fact that projects are progressively elaborated. This is in conformity with the findings of (Litten, 2013).

The analysis further revealed that majority (60.9%) of the respondents agreed that Client's demand is very significant to the choice of project scope management practices, Dynamism of technology (64.6%) and Returns on the investment (52.5%) are also significant to the choice of project scope management practices employed by the firms. Lastly, Fast-tracking (65.6%), Project delays (50.5%), Client's demand, and Technical skill required (69.2%) were factors that significantly affect choice of project scope management practices employed by the organizations.

The summary of these results revealed that twelve factors were identified and ranked proceeding to the extraction exercised. Only four of these factors were extracted. The implication of these results is that these four factors accounted for 4.00 and above of the variances observed as ranked in the analysis and critical for scope management practices in the Telecommunication firms.

Table 2 : Factors Influencing the Choice of Project Scope Management Practices Employed by Telecommunication Firms

Factors	5	4	3	2	1	Mean rank
Competitive advantage	-	62(58.5)	3 (2.8)	41(38.7)	-	4.56
Organizational Process Assets	-	12(11.3)	23(21.7)	41(38.7)	17(16.0)	3.68
Expert judgment	-	12(11.3)	44(41.5)	48(45.3)	-	3.69
Complex Activity list	-	3 (2.3)	19(17.9)	32(30.2)	3 (2.8)	3.61
Complex Project scope statement	9 (8.5)	91(85.8)	3 (2.8)	-	-	4.03
Limited resources	3 (3.2)	69(74.2)	21(22.6)	-	-	3.81
Fast-tracking	8 (12.5)	42(65.6)	14(21.9)	-	-	3.91
Project delays	2 (2.1)	48(50.5)	42(44.2)	3 (3.2)	-	3.52
Client's demand	56(60.9)	33(35.9)	-	-	3 (3.3)	4.51
Technical skill required	1 (1.3)	54(69.2)	20(25.8)	3 (3.8)	-	3.68

Dynamism of technology	10(15.4)	42(64.6)	10(15.4)	3 (4.6)	-	3.91
Returns on investment	41(41.4)	52(52.5)	3 (3.0)	-	3 (3.0)	4.29

Source: Field Survey (2014).

KEY: 1 = Not significant, 2 = Slightly significant, 3 = Moderately significant, 4 = Significant, 5 = Very significant

It can be deduced from the result that in order for telecommunication organizations to provide better value on similar products offered to customers among other competitors, they tend to match their existing core competencies with available opportunities so as to become the market leader. Also the study is in conformity with Project Management Institute report (2004) that Telecommunication organizations employ project scope management practices in projects implementation in order to be able to meet up with the clients demand and their expectations.

The implication of these results is that while the contributions of other extracted factors on choice of project scope management practices employed in the organizations should not be ignored; special attention should be given to these four critical factors (Competitive Advantage, Complex Project Scope Statement, Clients' Demand and Return on Investment). The knowledge and understanding of the contributions of these major factors are very pertinent towards the

choice of project scope management practices employed among telecommunication organizations.

c) Correlation Matrix of Factors Influencing the Choice of Project Scope Management Practices Employed by the Telecommunication Firms

Table 3 shows the Correlation matrix of the existing relationship the listed factors have on choice of project scope management practices employed by telecommunication organizations. The result revealed that only six out of the twelve factors; Organizational process assets ($r = .448^{**}$; $p < 0.05$), Expert judgment ($r = .261^{**}$; $p < 0.05$), Complex project scope statement ($r = .260^{**}$; $p < 0.05$), Limited resources ($r = -.425^{**}$; $p < 0.05$), Client's demand ($r = .533^{**}$; $p < 0.05$), and Returns on investment ($r = .309^{**}$; $p < 0.05$) were shown to have a significant relationship with the choice of project scope management practices employed in the firms. The six factors were tested at 0.05 level of significance.

Table 3 : Correlation Matrix of Factors Influencing the Choice of Project Scope Management Practices

	1	2	3	4	5	6	7	8	9	10	11	12	13
Factors	1.00												
CA	-.173	1.00											
OPA	.448**	.264	1.00										
EJ	.261**	.476**	.172	1.00									
CAL	.187	.372**	.955**	-.176	1.00								
CPSS	.260**	.158	.235*	.443*	-.216**	1.00							
LR	-.425**	-.108	.261*	.533**	-.456**	-.321	1.00						
FT	-.139	-.016	.176	.527**	-.043	.771**	-.516	1.00					
PD	-.207*	-.135	.292**	.004	-.007	.200	-.503**	-.026	1.00				
CD	.533**	-.074	-.160	-.441**	.115	-.317**	.360**	-.166	-.141	1.00			
TSR	-.085	-.093	.115	.879**	-.217	.426**	.275	.360**	.178	.156	1.00		
DoT	.157	.094	.442**	.518**	.267*	.441**	-.458*	.409**	.378**	-.084	1.00**	1.00	
Rol	.309**	.236*	-.035	.012	-.044	-.102	-.096*	-.436**	-.068	.242*	.244*	.251*	1.00

*Significant at 0.05 (two tailed)

**Significant at 0.05 (two tailed)

KEY: 1 = project scope management practices 2 Competitive Advantage, 3 = Organizational Process Assets, 4 = Expert Judgment, 5= Complex Activity List, 6 = Complex Project Scope Statement, 7 = Limited resources, 8 = Fast-Tracking, 9 = Project delays, 10 = Client's demand, 11 = Technical skill required, 12 = Dynamism of Technology, 13 = Returns on Investment.

d) ANOVA Results of Factors for the Choice of Project Scope Management Practices

Table 4 shows the Analysis of Variance results of the factors for the choice of project scope management practices employed in the firms from the opinion of the respondents. The result revealed that there was a significant difference ($F = 4.027$, $P = 0.045$) in the opinion of the respondents that 'competitive advantage' is a factor for the choice of project scope

management practices employed in the organizations. Also, 'organizational process' asset had a significant difference ($F = 44.804$, $P = 0.0001$) with the choice of project scope management practices employed in the organizations. 'Expert judgment' had a significant difference ($F = 4.452$, $P = 0.037$) with the choice of project scope management practices employed in the organizations, 'complex activity list' had a significant difference ($F = 60.014$, $P = 0.0001$) with the choice of

project scope management practices employed in the firms, 'complex project scope statement' had a significant difference ($F = 10.435$, $P = 0.0021$) with the choice of project scope management practices employed in the organizations, 'limited resources' had a significant difference ($F = 10.230$, $P = 0.0001$) with the choice of project scope management practices employed in the organizations, 'fast tracking' had a significant difference ($F = 30.738$, $P = 0.0021$) with the choice of project scope management practices employed in the organizations. However, the results

showed that there was no significant difference ($F=2.910$, $P = 0.091$) in the opinion of the respondents on 'project delay' as it affects the choice of scope management practices employed by the organizations. The results further shows that there was no significance difference ($F=0.210$, $P = 0.648$) in the opinion of the respondents on 'client's demand' as it affects choice of scope management practices employed by the organizations, there was no significance difference ($F=.021$, $P = 0.886$) in the opinion of the respondents on

Table 4 : ANOVA Results of Factors for the Choice of Project Scope Management Practices

FACTORS		Sum of Squares	Df	Mean Square	F	Sig.
CA	Between Groups	1.197	1	1.197	4.027	.045
	Within Groups	30.331	102	.297		
OPA	Between Groups	26.155	1	26.155	44.804	.000
	Within Groups	51.955	89	.584		
EJ	Between Groups	1.944	1	1.944	4.452	.037
	Within Groups	44.114	101	.437		
CAL	Between Groups	13.347	1	13.347	60.014	.000
	Within Groups	12.010	54	.222		
CPSS	Between Groups	1.903	1	1.903	10.435	.002
	Within Groups	18.057	99	.182		
LR	Between Groups	19.960	1	3.266	17.230	.000
	Within Groups	3.266	91	.190		
FT	Between Groups	7.105	1	7.105	30.738	.000
	Within Groups	14.332	62	.231		
PD	Between Groups	.968	1	.968	2.910	.091
	Within Groups	30.279	91	.333		
CD	Between Groups	.138	1	.138	.210	.648
	Within Groups	58.609	89	.659		
TSR	Between Groups	.007	1	.007	.021	.886
	Within Groups	24.980	76	.329		
DoT	Between Groups	.638	1	.638	1.283	.272
	Within Groups	30.800	62	.497		
RoI	Between Groups	1.726	1	1.726	2.706	.103
	Within Groups	60.603	95	.638		

KEY: CA = Competitive Advantage, OPA = Organizational Process Assets, EJ = Expert Judgment, CAL= Complex Activity List, CPSS = Complex Project Scope Statement, LS = Limited resources, FT = Fast-Tracking, PD = Project delays, CD= Client's demand, TSR = Technical skill required, DoT = Dynamism of Technology, RoI = Returns on Investment.

'technical skill required' as it affects choice of scope management practices employed by the organizations, there was no significance difference ($F=1.283$, $P = 0.272$) in the opinion of the respondents on 'dynamism of technology' as it affects choice of scope management practices employed by the organizations, there was no significance difference ($F=2.706$, $P = 0.103$) in the opinion of the respondents on 'return on investment' as it affects choice of scope management practices employed by the organizations.

VI. CONCLUSION

The study investigated project scope management practices among organizations in the telecommunication sector in Nigeria and examined the determinant factors for the choice of project scope management practices employed in the organizations.

The study revealed that major project scope management practices employed by telecommunication firms were define project scope, create work breakdown

structure, verify scope, and control scope. The factors shown to significantly influence the choice of project scope management practices were competitive advantage, organizational process assets, complex activity list, complex project scope statement, limited resources, fast tracking, and expert judgment. The studies further revealed that the key significant impact of project scope management practices on project success were customer expectation, customer satisfaction, resource allocation and project duration.

The adoption of project scope management practices by telecommunication organizations in Nigeria are majorly affected by 'Competitive advantage', 'Complex project scope statement', 'Client demand' and 'Return on investment'. This will eventually ensure profitability, better return on investment and continued market share.

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