



## Preferred Team Roles of Construction Team Members in Selected Higher Institution Projects

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### ABSTRACT

The study appraises the preferred team role of construction team members in selected higher institution projects in Nigeria, with a view to improving delivery of such projects. The study used purposive sampling technique to select two higher institutions studied and census survey was used in selecting 35 completed construction projects executed by the institutions. A total of 191 questionnaires were distributed to obtain information from construction team members who participated in the selected construction projects. Mean Item Score was used in ranking the preferred team roles of construction team members. The results revealed that the construction team members' preferred team roles by personal assessment are different from their preferred team roles by other observers' assessment of individual construction team members. Construction team members have more than one preferred team roles and that the most preferred team role of Quantity surveyors, clients and contractors is resource investigator while the most preferred team role of Architects, Structural/Civil Engineers and Service Engineer is Planter, Implementer/company worker and specialist respectively. The study concluded that a deliberate attempt should be made in determining the preferred team roles of construction team members before co-opting them into a team so as to improve construction projects delivery.

## 1. Introduction

Industries all over the world are moving from meeting expectations to being high performing enterprises. High performance teams achieve results that exceed the expectations of the project and often demonstrate unique or innovative approaches. These teams challenge conventional expectations by combining individual strengths and knowledge to generate solutions that exceed the capability of an individual team member. These high performance teams focus on exceeding traditional measures rather than focusing on meeting the benchmark accepted by previous project teams. This concept of high performance is documented and routinely implemented in diverse industries such as healthcare, manufacturing and transportation. However, as posited by Chinowsky, Diekmann and VGalotti (2008) high performance teams and solutions receive less attention in the construction domain. Rather, the measurement of success within a construction project is still often based on meeting traditional benchmarks for the classic factors of time, cost, and quality.

Notwithstanding this modern days industrial revolution of high performance teams, the performance of Nigerian construction industry is still below this traditional benchmark (Aibinu and Jagboro, 2002; Adejo and Babalola, 2013; Opawole, 2016). To achieve the historical

benchmark of cost, time and quality within the context of construction projects, the determination of the preferred team roles of construction team members on construction projects is of immense importance as construction projects is realized within the purview of team effort.

The execution of construction projects from time immemorial is based on application of team work. The management of construction projects has been carried out since man first cooperated to erect buildings, yet there is little documented knowledge of how people interact in this process. It is revealing that historical and contemporary accounts of construction work pay little attention to how people work together and manage their activities. The concept of teamwork is very applicable to the construction industry as construction products are delivered by a collection of professionals. Cornick and Mather (1999) asserted that construction itself probably generated the earliest examples of teamwork for more peaceful purposes, as man emerged from the caves and started building his shelters from natural materials on top of the ground. Today, the construction team is becoming extremely large and complex with different procurement arrangements and project management applications. We have to acknowledge that large scale modern buildings requires a team effort, simply to share out the total project into manageable task to keep client and society happy and to maximize the chances of a project's success in what is often in a fiercely

competitive environment (Barry, 1992).

Several researches have defined the term construction project team in various ways. According to Chan and Tam (2001), a project team in the construction industry is a group of construction professionals and personnel from one or more organizations who combine to fulfill the necessary design, detailing and construction functions comprising the construction project. Winch (2002) further defined this team as the consultants, contractors, specialists and others who come together to design, manage and construct a product. When construction teams are evaluated with regard to the ideal team definition given by Katzanbach and Smith (1993), there are many features that suggest that construction teams are similar to the ideal teams. The construction team is comprised of a relatively small number of key people made up of a diverse range of professionals, each with expertise in their respective disciplines. Therefore, it is obvious that each member possesses complementary skills. Even though each participating firm has its own ongoing business objectives, they also have a common project objective, which is a key feature in an ideal team. Even though the reasons given above suggest that the construction team is similar to the ideal team, the lack of mutual accountability and the existence of contrasting objectives (Cornick and Mather, 1999) can cause construction teams to deviate from the ideal team definition.

Olatunde, Ogunsemi and Oke (2017) examined the impact of team members' composition on construction projects delivery in selected higher institutions in Nigeria and found that construction team members' composition has significant impact on the completion time of construction projects though with small magnitude while the impact of construction team members' composition on construction cost is not significant. The preferred team roles of construction team members is a major determinant of the performance of such team since the preferred team roles deal with the innate ability of individual team members (Belbin, 1993), rather than the functional roles that each team members assumed due to their training and professional certification (Senaratne and Gunawardene, 2015; Khan and Hussain, 2016).

Improper construction team members' composition has been identified to hinder construction projects optimum performance (Olatunde et al, 2017). Several researches have assessed the team application in construction industry (Carson and Isaac, 2005; Stewart et al, 2005; Bernard and Andrew, 2011; Anyanwu, 2013; Senaratne and Gunawardene, 2015;) but no known study have attempted to examine the preferred team roles of construction team members especially as it affect higher institutions projects in Nigeria. In light of this reality, this study therefore, investigated the preferred team roles of construction team members with a view to improving construction projects delivery in Nigeria.

## 2. Theoretical Background

The overall interest of an employer is the delivery of his project within cost, time and without compromising quality. Teams are used in organizations in most sectors and industries due to the recognition that they are able to outperform individuals acting alone, especially when performance requires multiple skills and judgments (Hayes, 2002; Scarnati, 2001). In response to performance improvement demands on the construction industry, research into teams has significantly increased over recent years (Constructing Excellence, 2004; Ochieng and Price, 2009; Smith and Offodile, 2008). Many of the studies have adapted factors that influenced improved performance in the manufacturing

sector. The results of such research have demonstrated that team have significant potential for increasing productivity (Hayes, 2002) and frequently result in considerable performance improvement (Bernard and Andrew, 2011), largely because they can get better results than where individuals operate within defined job roles. Within a team, there tends to be a variety of knowledge and skills, which can be pooled along with information and resources that can be shared (Driskell, 1992).

The complex nature and the presence of different skills in construction, means that teams are needed for success in construction (Bower, 2003; Gould, 2002) because they enable complimentary use of available skills to achieve high productivity, (Constructing Excellence, 2004; Conti and Kleiner, 1997). The success of a construction project depends on a number of factors, such as project complexity, contractual arrangements, relationships between project participants, the competency of project managers and the abilities of key project members (Mohsini, and Davidson, 1992; Chua, Kog and Loh, 1999).

Successful project delivery requires the concerted effort of the project team to carry out the various project activities (Sai, Henry and Kevin, 2004). Pinto (2007) posited that project success depends as much on the effective management of project personnel as on technical management. Interest in how project management practices can be improved to create conditions for project success is high for both practitioners and researchers (Kieser and Nicolai, 2005; Lingham, Rezaia, and Dolan, 2006). Christina and Danny (2009) commented that for construction projects, team design and leadership factors are the most important factor in teams. Team design refers to the composition of the team and the functional backgrounds, skills and expertise of team members.

Leadership of the team refers to the project leader's skills, experience and expertise and also to their continuity and the incentives provided. Dickinson and McIntyre (1997) identified and defined seven key components of teamwork which are critical to any improvement exercise: communication; team orientation; team leadership; monitoring; feedback; backup behavior; and co-ordination. Clients in the construction industry often put teams together to achieve project realization. The performance of the team depends on the personality and interaction of the team members and on the expertise and experience of each individual. It is much like casting actors for a play, each actor brings a certain quality and dimension and unless the casting is done with care, the director will find the cast incompatible with the script (Wiggins, 1985). The same is true in teams, unless the team is selected with care; the output from the team is unlikely to meet the client expectations.

Quite often companies wonder why their teams are ineffective and not delivering to time, quality and cost which can be put down to team. Team building is not just about putting together human resources and then deploying them on a project. It is the creation of a winning and collaborative spirit among team members so that they can work efficiently and in harmony with each other to achieve project goals. Team building process is probably the most neglected aspect of project management (Lewis, 1998)

Belbin (1981 and 1993) opined that optimal team performance may be obtained when each of the nine team role behaviors can be provided by the members of the team. If a given team contains; a Chairman or Coordinator, an Implementer or Company worker, a Completer, a Monitor or Evaluator, a plant or Planter, a Resource investigator, a

Shaper, Specialist, and a Team worker. The team types which emerged through a process of observation and reflection. The Belbin Team Role Self-Perception Inventory (BTRSPI) was designed to measure behavioral characteristics which individuals display when working in teams (Lessem & Baruch, 1998). Most personality traits are acknowledged to be fairly constant, behavior can change more readily, adapting to changes in any of those factors which influence it and as a result, team role preferences might change over time (Belbin, 1981). Whilst it is unlikely that an individual's profile will change dramatically or be reversed altogether, some alterations are expected, in line with a change of job role or work environment, or as a result of a major life change.

An individual does not have one team role, but a combination of preferred, manageable and least preferred roles (Sommerville and Dalziel, 1998). The distribution and interrelation of these roles across an individual's profile have a great influence on the way the roles will be played out in practice and experienced by others. Belbin (1981) stated that in the Self-Perception team role profile, an individual's team roles are analyzed in three categories:

- **Preferred Roles:** Those roles which an individual is comfortable playing and which come naturally.
- **Manageable Roles:** Those roles which an individual can play if required for the benefit of the team. These may be cultivated to broaden the individual's team working experience.
- **Least Preferred Roles:** those roles which the individual does not naturally or comfortably assume. It is generally recommended that the individual avoids contributing in these areas, lest the pitfalls of the behavior outweigh the strengths.

Asbjorn, Aanesen and Linjegods (2000) observed that for preferred team roles, it is sometimes observed that those who have been in the work environment for a longer period of time are likely to have a more defined or polarized team role profile, since a longer experience of a working environment tends to increase awareness of one's strengths and weaknesses. Dulewicz (1995) investigated the association between team role and responsibility or status. In order to do so, salary, total remuneration, and the total number of staff and total expenditure budgets are measured, for whom the individual had responsibility. It was also discovered that team roles seemed to be independent of

measures of salary and job responsibilities. Shi and Tang (1997) asserted that a given environment may promote the rise of particular team roles. For example, a threatening or political climate may promote a sober and discerning individual to a managerial position, who is shrewd in judging their environment and others around them in other words, a Monitor/Evaluator.

### 3. Methodology

The research population consisted of team members on construction projects which included Client, Contractor, Architect, Quantity Surveyor, Structural Engineer and Services Engineer, that participated in the 35 selected completed public educational construction projects. A visit to the selected case study institutions (Obafemi Awolowo University, Ile Ife and Federal Polytechnic, Ede) revealed the following which served as basis for the research population.

From the information in Table1, Obafemi Awolowo University, Ile-Ife executed 27 construction projects within the period (with and without consultants) and Federal Polytechnic, Ede executed 57 construction projects (with and without consultants) with 10 and 25 construction projects (with consultant) respectively. Therefore, the total number of projects studied was 35 completed construction projects. A list of the team members that participated in the selected projects was obtained from the Physical Planning and Development Unit of the selected institutions that is, Federal Polytechnic Ede and Obafemi Awolowo University, Ile-ife. The total population for the questionnaire administration included all team members that participated in the selected completed construction projects.

The sample size for this study was total enumeration survey of the whole 35 sampled completed construction projects teams with 191 respondents, that is, 35 Clients, 35 Contractors, 31 Architects, 30 Civil Engineers, 25 Services Engineers and 35 Quantity Surveyors as indicated in Table 2. The population size for Architects, Structural/Civil engineers and Service engineers were not up to 35 because some of the selected construction projects were civil engineering projects and services of Architect or Services engineer were not engaged.

Data were collected by mean of a structured questionnaire designed and distributed to the 191 respondents that participated in the 35 selected completed construction projects from the two selected institutions. Out of 191 questionnaires administered, 144 were completed and returned. However, only 100 of the total questionnaire sent out was used for analysis; this was because the responses of the team members were not complete on the remaining 44 and did not fit

**Table 1:** Case study institutions and number of construction projects executed in 2000 -2013

Project Status	Obafemi Awolowo University, Ile-Ife	Federal Poly-technic Ede	Total
Number of completed construction projects with traceable records (without consultants)	17	32	49
Number of completed construction projects with traceable records (with consultants)	10	25	35
Total	27	57	84

Source: Physical Planning Development Unit, Federal Polytechnic Ede and Physical Planning Development Unit Obafemi Awolowo University, Ile Ife (2013)

**Table 2:** Sample size of each category of respondent

Category	Respondent	Sample
A	Clients (CLI)	35
B	Contractors (CON)	35
C	Consultants	
	Architects (ARC)	31
	Quantity Surveyors (QSV)	35
	Civil/Structural Engineer (STE)	30
	Service Engineers (SRE)	25
	Total	191

**Table 3: Summary of responses on questionnaire**

Attribute	Classification	Frequency	Percent
Role played	Quantity Surveyor	17	17.0
	Architect	16	16.0
	Civil/Structural Engineer	17	17.0
	Services Engineer	16	16.0
	Client	17	17.0
	Contractor	17	17.0
	Total	100	100.0
Years of experience	0-5	7	7.0
	6-10	17	17.0
	11-15	39	39.0
	16-20	11	11.0
	21-30	24	24.0
	Above 30	2	2.0
	Mean	15	100.0
Academic qualification	HND	9	9.0
	PGD	26	26.0
	Bachelor	22	22.0
	Masters	41	41.0
	PH.D	2	2.0
Total	100	100.0	
Membership of professional bodies:	NIQS	22	23.0
	NIA	23	23.0
	NIOB	9	9.0
	NSE	40	40.0
	Others	2	5.0
Total	96	100.0	
Type of Memberships	Graduate	15	16.0
	Associate	78	81.0
	Fellow	1	1.0
	Others	2	2.0
	Total	96	100.0
Number of projects executed	1-10	14	14.0
	11-20	18	18.0
	21-30	34	34.0
	31-40	9	9.0
	41-50	7	7.0
	Above50	18	18.0
	Mean	29	100.0

for analysis because the study was team based. This represents 75 percent response rate. Likert scale type 5-1 was used to determine the Mean Item Score (MIS) of the preferred team roles of construction team members. Where each team member has highest mean item score is his most preferred team role.

#### 4. Results And Discussion

Table 3 shows the general characteristics of respondents. It was observed that quantity surveyors, structural/civil engineers, clients and contractors represented 17 percent each of the respondents, while architects and services engineers represented 16 percent each. The average year of working experience of the respondents was calculated to be 15years which could be considered adequate for the study because information supplied by this category of professionals is considered adequate and reliable for analysis. It could be seen that majority of the respondents were Masters holder with 41 percent, follow by PGD holder which represent 26 percent, while only 2 percent of the respondent had PH.D as their highest academic qualification. 96 percent of the respondents were members of different

professional bodies. This was expected because client may not necessarily be a member of any professional body. Of this, 23 percent, 24 percent, 9 percent, 42 percent were members of NIQS, NIA, NIOB, and NSE respectively while 2 percent were members of other professional bodies. Majority of these professionals were corporate (associate) members which represents 78 percent, while Graduate, fellow and other categories of membership was 15 percent, 1 percent and 2 percent respectively. The average number of project handled or executed by the respondents was calculated to be 29. This was considered appropriate as the respondents had sufficient experience.

##### 4.1 Preferred Team Roles of Construction Team Members Based on Team Assessment

Respondents were asked to assess each member of their team on team roles played based on their experience when they worked together as a team on the selected projects. The results as presented in Table 4 showed that for Architects, the preferred team roles were planter, implementer/company worker and coordinator; the manageable roles were team worker, shaper and completer/finisher and the least preferred roles were monitor/evaluator and resource investigator. For Quantity surveyors, the only preferred team role was resource investigator; while Structural/Civil Engineers preferred to be implementer/company worker and specialist.

For Services engineers, the only preferred team role was specialist. Clients preferred to be resource investigator and implementer/company worker and the contractors preferred team roles were resource investigator and implementer/company worker. The most dominant preferred team role was resource investigator with 3.56 overall mean while the least dominant preferred team role was shaper with 3.34 overall mean.

##### 4.2 Preferred Team Roles of Construction Team Members Based on Individual (self) Assessment

Respondents were asked to assess themselves on team roles played in the execution of selected projects. The results as presented in Table 5 showed that for Architects, the preferred team roles were completer / finisher, chairman/ coordinator and specialist. For Quantity surveyors the preferred team role were specialist, resource investigator and monitor/ evaluator, the manageable roles were completer /finisher, team worker and chairman /coordinator; and the least preferred role was shaper. For Structural/Civil Engineers; the preferred roles were completer/ finisher, team worker and resource investigator; manageable roles were monitor/evaluator and shaper. The Service Engineers preferred team roles were monitor/evaluator, completer/ finisher and team worker; the manageable roles are specialist, company worker/implementer and chairman/ coordinator.

For client, the preferred roles were completer/ finisher, monitor/ evaluator and planter, the manageable roles were company worker / implementer, team worker and chairman/coordinator and the least preferred roles are resource investigator, shaper and specialist and contractors preferred team roles were planter, resource investigator and completer/finisher, and manageable role was shaper. The most dominant team role was completer/finisher with 4.21 overall mean while the least dominant team role was company work/implementer with 3.5 overall mean.

The team role of construction team members were analysed in three categories which are preferred team roles, manageable team roles and least preferred team roles. This study used two methods to determine

**Table 4:** Preferred team roles of construction team members based on assessment of all team members

TEAM ROLES	ARC		QSV		STE		SRE		CLI		CON		OVERALL	
	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank
Implementer/Company worker	3.79	2	3.47	2	3.61	1	3.35	4	3.51	2	3.54	2	3.55	2
Completer/Finisher	3.62	6	3.38	5	3.43	6	3.07	8	3.48	3	3.26	6	3.37	6
Shaper	3.66	5	3.16	9	3.45	4	3.02	9	3.38	6	3.36	3	3.34	8
Team worker	3.71	4	3.32	6	3.33	8	3.24	6	3.34	8	3.29	5	3.37	6
Resource investigator	3.51	8	3.56	1	3.47	3	3.42	2	3.73	1	3.69	1	3.56	1
Coordinator/Chairman	3.72	3	3.26	8	3.44	5	3.18	7	3.39	5	3.18	7	3.36	7
Planter	3.82	1	3.28	7	3.42	7	3.41	3	3.35	7	3.15	8	3.41	5
Monitor/Evaluator	3.58	7	3.45	3	3.45	4	3.32	5	3.48	3	3.34	4	3.44	4
Specialist	3.47	9	3.42	4	3.55	2	3.51	1	3.44	4	3.36	3	3.46	3

*Note:* ARC- Architect; QSV- Quantity Surveyor; STE- Structural/Civil Engineer; SRE- Services Engineer; CLI- Client; CON- Contractor

**Table 5:** Preferred team roles of construction team members based on individual team member's self-assessment

TEAM ROLES	ARC		QSV		STE		SRE		CLI		CON		Overall	
	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank
Implementer/Company worker	3.44	4	3.06	8	3.35	6	3.63	5	4.24	3	3.29	7	3.50	9
Completer / Finisher	4.50	1	4.29	4	4.24	1	4.06	2	4.53	1	3.65	3	4.21	1
Shaper	3.31	6	3.59	7	3.53	5	3.31	8	4.00	6	3.53	4	3.55	7
Team worker	3.44	4	4.24	5	4.00	2	3.88	3	4.18	4	3.18	8	3.82	4
Resource investigator	2.69	8	4.65	2	3.65	3	3.25	9	4.06	5	3.94	2	3.71	5
Coordinator /Chairman	3.81	2	3.76	6	3.35	6	3.56	6	4.06	5	3.41	6	3.66	6
Planter	3.00	7	3.00	9	3.41	3	3.38	7	4.29	2	4.18	1	3.54	8
Monitor / Evaluator	3.38	5	4.53	3	3.59	4	4.19	1	4.29	2	3.47	5	3.91	3
Specialist	3.56	3	4.71	1	3.29	7	3.81	4	3.88	7	3.47	5	3.79	2

*Note:* ARC- Architect; QSV- Quantity Surveyor; STE- Structural/Civil Engineer; SRE- Services Engineer; CLI- Client; CON- Contractor

the preferred team roles of construction team members with slight difference in the result obtained. This is because the two methods deal with people assessment (observer assessment). While the first method dealt with all team members observation of each other; the other method dealt with personal assessment by each team member. Therefore, the researchers posited that the first method may be more accurate on the premise that as the saying that two good heads are better than one. This research has been able to establish that Resource investigator is the most common team role preferred by many construction team members since three out of six construction team members studied in this work (Quantity surveyor, Client and Contractor) has Resource investigator as their most preferred team role while the Architect, Structural/Civil Engineer and Service Engineer is Planter, Implementer/company worker and specialist respectively. This study is in line with findings of previous studies that an individual does not have one team role, but a combination of preferred, manageable and least preferred roles (Belbin, 1981; and Sommerville and Dalziel, 1998). The preferred team roles of construction team members played a major role in the performance of such projects as the individual innate ability (preferred role) would determine team members' behavior in team environment. The duplication of the preferred team roles of major team members (Quantity Surveyor, Contractor and Client) could be the reason for poor performance of construction projects in the study area (Aibinu

and Jagboro, 2002; Ade-ojo and Babalola, 2013; Opawole, 2016) since playing the same role(s) by two or more team members has been shown to be significant as contributor to increase in completion time of construction projects, though not significant as contributor to increase in construction cost (Olatunde et al, 2017). Similarly, Aibinu and Jagboro(2002) has identified resource supply, control and management as major contributor to projects delay, this could be made worsen when such construction resource(s) supply, control and management is control by more than a team members as evident from the finding of the study.

## 5. Conclusions and Recommendations

This study has explored the preferred team roles of construction team members in selected higher institutions in Nigeria and the following conclusions were drawn: The construction team members' preferred team roles by personal assessment are different from their preferred team roles by other observers' assessment of individual construction team member. This is real and true in human interaction because often time, an individual may claim to be something but what others can see him to be is a different thing altogether. The construction team members (architects, quantity surveyors, services engineers, civil/ structural engineers, contractors and clients) have more than one

preferred team roles. The most preferred team role of Quantity surveyors, clients and contractors is resource investigator while the most preferred team role of Architects, Structural/Civil Engineers and Service Engineer is Planter, Implementer/company worker and specialist respectively. The role of Resource investigator is the most common team role preferred by many construction team members. This conclusion demonstrated the centrality of human and materials resources to construction projects as construction activities cannot be successful without them.

In line with the conclusions drawn from the study, the following recommendations are proposed for the stakeholders in the industry so as to achieve improved construction delivery: all intended team members on a construction project should be studied and determine their preferred team roles before co-opting them to be member of a construction project team, special consideration and attention should be giving to studying quantity surveyor, client and contractor before commissioning a construction team as these three members has the same preferred team roles. Further studies are recommended to link the impact of multiple roles by project team members on the performance of construction projects. Also, future study could explore the relationship between team roles and functional roles of construction team members.

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