CONSTRUCTION PROFESSIONALS' TEAM ROLES AND THEIR PERFORMANCE

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ABSTRACT

The construction industry is made up of professionals whose various disciplines are to ensure that construction work is completed as appropriate. This study evaluates the performance of construction professionals with respect to various team roles in the construction industry. The study adopted a survey research design with the use of a well structured questionnaire which was administered on construction professionals, 42 copies were retrieved and used for the analysis out of the administered 62. Frequency and percentiles was used to analyse the distribution of demographic descriptors of construction professionals while mean score and mean difference was used to analyse the roles of construction professionals and factors influencing the performance of construction professional. The findings revealed that the major role of an architect is to translate the user's needs into builders requirement, engineer is most concerned with the calculation of load and grade requirements, liquid flow rates and materials stress points to ensure that the structure can withstand stress, the quantity surveyor is mostly concerned with management and control of costs within the construction projects while a builders major role is building production management. The performances of construction professionals are, however, affected mostly by remuneration, motivation and incentives and promotion opportunities and least affected by supervision and co-worker. The demographic factors which mostly affect the professionals are experience, gender and age. Based on the findings of the research, the majority of the construction professionals are male therefore; better friendly work environment should be created by the managements of the construction industry so as to attract female professionals. Also, construction industries should focus its efforts on improving the performance of young and newly employed construction professionals by developing management training programs, workshops, financial incentives, and other non–work-related activities that would encourage and support them to stay and grow with the industry, since there are relatively few young professional in the industry.

Keywords: construction,Construction Professionals, Performance, Team Work, Team Roles, Nigeria.

I. INTRODUCTION

The performance of construction professionals is a factor that basically determines the long term effect of construction works they produce, this factor also boils down to the level of experience and training these professionals have attained over the years. So many issues have over the years constituted problems for construction professionals, most importantly is the issue of time frame for which they have to execute

construction works. [1] discovered that on frequent occasions, before going into negotiations architects, quantity surveyors and civil engineers do not have enough space of time to prepare accurate aesthetic and structural drawings and quantity take off and billing for the proposed structures due to client's requirements which is most times a very short period of time. In addition, the manner in which construction professionals adapts to this unfavourable working condition depends on the working experience which they have attained over time, this has constituted another problem in the construction industry as most construction professionals in recent times are fresh graduates who, though might be intelligent does not have the required experience to manage these conditions and perform at the highest level of productivity. According to a research study by [2], employees are always opting out of firms offering construction professional services every year, this results in Nigerian construction industry constantly loosing key employees due to some factors affecting performance of these professionals which are neglected in the management. For this reason, firms are forced to train new employees repeatedly spending money on training and recruitment of new employees, overall productivity decreases as a result. Also, when employees are not satisfied with their job, they deal with customers in a cruel and unconcerned manner and hence customer satisfaction is affected in a great extent.

Also, [3] observed that another problem that has afflicted the construction industry over time is the fact that these construction professionals have been made to work under unfavourable conditions, the aftermath of their activities is evident in the quality of work they deliver, this has overtime lead to the increased rates of bridge collapse, road cracking, over flooding of dams and many more. This research therefore seeks to evaluate the effect and factors affecting professional performance of construction professionals. The findings of this research will avail the construction industries the information on how to effectively manage construction professionals with respect to their performance.

II. LITERATURE REVIEW

Construction Team Members

The construction industry is a wide industry that contributes to the economy of any country. There are different types of construction projects an organization can engage in and the aspect of construction determines the specialists or professionals to be involved in the construction process. Construction projects range from building constructions to heavy engineering works. [4] stated that integrated teamwork is the key to construction projects that personify good whole life value and performance. Integrated teams deliver greater process efficiency and by working together over time can help drive out the old style adversarial culture and provide safer projects using qualified trained workforce. It was further argued that teams that only construct one project team at the client's expense would never be as efficient, safe, productive or profitable as those that work repeatedly on similar projects.

A construction team is a group of people responsible for the planning, designing and construction of a project. The professionals in the industry include the Architects, Quantity Surveyors, Engineers (Civil, Mechanical, Structural, Electrical) the Building Contractors, Artisans and the suppliers. All these professionals perform different roles in order to enhance the success of any construction project.

Construction Team Members and their Responsibilities

For any construction project to be successful, each member of the construction team must perform their roles diligently. The roles to be performed by each member of the construction team will be highlighted in this section. The construction team is often thought as comprising the architect or engineer (design team), owner (owner's representative), and contractor (builder). The design team is comprised of architects, engineers and consultants that produce the construction documents for the owner. The owner can be a public or private entity that provides the project requirements and funding for design and construction [5]

The team members to be discussed under this section with reference to their roles are; The Architect, the Quantity surveyor, Engineers and the Building Contractors. The allocation of responsibilities among the owner and its contractors, which may vary even for projects executed using the same delivery system, can be affected by several factors, such as confidentiality of the company's business, owner risks, schedule delays, change orders, level of communication within a project, and contract claims [1].

The Architect

Architecture is the design side of construction. It relies on professional architects who provide a design service for clients and strive to produce a design that meets the needs of the client, while being eye-catching and sustainable. [6] defined an Architect as the person who directly communicates with the client and he is the first professional who is contacted by the client for the translation of his desire or need into drawings and specification. The architect has overall responsibility for the design of the construction project in accordance with the client's specification. The architect also performs the following roles;

1. The architect ensures the buildability of the design.
2. The architect is responsible for the selection of contractors and subcontractors.
3. He is responsible for contract administration,
4. He is responsible for project coordination and coordination of other project team members by visiting the construction site on a regular basis as is necessary to determine that the work is proceeding generally.

The architect is generally believed to be the project team leader and coordinator. The architect plays an important role in ensuring the success or failure of a construction project.

The Quantity surveyor

[7] defined a quantity surveyor as professionally trained, qualified and experienced personnel in dealing with problems relating to construction cost, management and communication in the construction industry. The quantity Surveyor (QS) is one of a number of professionals involved in the construction process and has specific responsibility for project cost control not only through the construction phase but for the whole life of the building [8]. Traditionally quantity Surveying is concerned with contracts and costs on construction projects and quantity surveyors control construction costs by accurate measurement of the work required. This role is achieved by performing the following activities:

1. Conducting feasibility studies to estimate materials, time and labour costs.
2. Preparing, negotiating and analysing costs for tenders and contracts.
3. Coordination of work effort.
4. Advising on a range of legal and contractual issues.
5. Valuing completed work and arranging for payments.

Engineers

Engineers involved in building constructions can be classified into three parts. The structural engineers provide design drawings which show the locations, sizes, reinforcement and details of structural elements at their appropriate scales, to enable the fabrication, installation, and connection of the elements in a reasonable sequence by a reasonably competent general or subcontractor who is familiar with the techniques of construction for the specified materials.

Mechanical engineers prepare complete, contract drawings using the same scale as that of the building layout drawings showing the mechanical services needed and their location. The mechanical services include: plumbing, drainage, heating, ventilating and air conditioning, fire protection, process piping and equipment and other special systems necessary. ([9], [10]). The electrical engineers prepare complete, contract drawings using the same scale as that of the building layout drawings showing the electrical services needed and their location. The electrical services include: lighting and power, HVAC electrical services, communication and alarm system requirements, one line diagram and risers and other special systems necessary.

Building Contractors

A building contractor is an individual who engages in the planning, developing and coordinating of activities which coincide with the building of structures [11]. The general responsibilities of a building contractor entail the individual planning and carrying through any and all pertinent activities relating to the construction of a dwelling, building or other structure. The building contractor carries out his/her duties by:

1. Supervising employees, planning how the project will be carried out and completing the project in a manner which coincides with all laws, rules and regulations which may be in existence and correlate with construction.
2. Implementing a plan in which to carry out the construction project. This extends anywhere from hiring workers to developing a step-by-step timeline that the project will follow from start to finish.
3. The building contractor is responsible for hiring, supervising and, at times, firing employees who work on the specific project with the contractor. Along those same lines of supervising the employees, the building contractor must also take care of payroll with regard to the workers and engage in payroll functions or hire someone to do so for the contractor.
4. The building contractor is also responsible for obtaining materials for the project. Since construction projects cannot be completed without the necessary building materials, it is up to the contractor to acquire goods to build the structures. This involves various forms of correspondence with necessary material suppliers.

5. The building contractor must also do his/her research regarding relevant regulations and laws akin to the construction process. There are many laws which state when, where and how a building contractor and his crew should build in certain areas. These must be recognized and followed by building contractors in order to complete the project in a law-abiding manner.

Lastly, the building contractor is the individual who deals with all emergencies and surprises which relate to the project and occur on-site and sometimes off-site as well. This individual is the one which many parties go to should they need assistance with an emergency issue that has just arisen.

III. RESEARCH METHODOLOGY

The research design used for this study is the qualitative type of design which relies on people's perception as regards the impact of team member composition on the success of construction projects. The population are the professionals that are directly involved in the execution of building projects. These professionals include the Architects, Quantity Surveyors, Engineers and the Building Contractors.

Table 1: Number of registered firms in Ondo State

S/N	Professionals	Questionnaire distributed
1	Architects	13
2	Quantity surveyors	18
3	Builders	12
4	Engineers	19
	Total	62

Due to small number of identified respondents, a total of 62 questionnaires - representing the total population - were administered while only 42 were retrieved and certified fit for analysis. Percentile was used to assess the distribution of demographic descriptors while mean score and mean difference was used to assess the level of performance of construction professionals.

IV. FINDINGS AND DISCUSSION

Respondent's information

Table 1 shows the information of the 42 respondents that filled the structured questionnaire. 16.7% were architects, 33.3% quantity surveyors, 28.6% engineers and 21.4% were building contractors. Also deduced from the analysis is the fact that 14.3% were B.Sc. holders, 9.5% were M.Sc. holders while 76.2 % were HND holders. 54.8% have working experience of an average of 3 years, 38.1% has worked for an average of 8 years ,none of the respondents have worked for an average of 13 and 18 years and 7.1% have working experience of over 20 years.

26.2% have executed an average of 3 numbers of projects since operation, 14.3% executed an average of 8 projects, 33.3% executed an average of 13 projects, 7.1% executed an average of 18 projects while 19.0% have

executed more than 20 projects since operation. In terms of professional qualification, 33.3% are Fellows, 23.8% are corporate/associates and 38.1% are probationer members.

Table 1: Respondent's Information

Respondent's Information	Frequency	Percent
Designation of respondent		
Architect	7	16.70
Quantity surveyor	14	33.30
Engineer	12	28.60
Builders	9	21.40
Total	42	100.00
Highest academic qualification of respondent		
B. Sc	6	14.30
M. Sc	4	9.50
HND	32	76.20
Total	42	100.00
Working experience of respondent *(Average)*		
3 years	23	54.80
8 years	16	38.10
Over 20 years	3	7.10
Total	42	100.00
Total number of projects executed *(Average)*		
3	11	26.20
8	6	14.30
13	14	33.30
18	3	7.10
Above 20	8	19.00
Total	42	100.00
Professional qualification (Category)		
Fellow	14	33.30
Corporate / associate	10	23.80
Probationer	16	38.10
Total	40	95.20
Missing system	2	4.80
Total	42	100.00

Project team members

The construction team consists of the Architects, Quantity Surveyors, Engineers, the Building Contractors, the Artisans and the Suppliers. Each of the team members has their specific role so as to ensure the successful completion of the construction project and delivery to time within the budget of the client.

Table 2: Effects of Team Members on Success of Construction Projects

Team members	Mean	Rank
Architect	4.60	2
Quantity surveyor	4.43	4
Civil/structural engineer	4.71	1
Project manager	4.55	3
Builder	4.29	5

Table 2 explains the effect of team members on the success of construction projects were rated on a scale of 5 – 1. The table shows that all the team members have significant effect on success of construction projects. Civil/Structural Engineers were ranked to have the highest effect, followed by Architects, then Project manager, quantity surveyors and builders.

Table 3: Attributes of Team Members and Effective Team

Attributes of team members	Mean	Rank
Appropriate team composition	4.67	1
Commitment to team success and shared goals	4.36	3
Commitment to team processes, leadership & accountability	4.24	4
Interdependence	4.02	6
Interpersonal Skills	4.12	5
Open Communication and positive feedback	4.50	2

Table 3 discusses the level of importance of the attributes of team members towards achieving an effective team. All the attributes are very important but Appropriate team composition was ranked as the most important attribute, followed by Open Communication and positive feedback, Commitment to team success and shared goals, Commitment to team processes, leadership & accountability, Interpersonal Skills and Interdependence.

Roles of team members

Table 4 ranks construction team members on the level of their performance using the Belbin team roles. For the Plant role, it was discovered that Project managers, Architects and Building contractors exhibits the features of plants. Project managers, Architects and Quantity surveyors are Resource investigator. Project managers, Engineers and Architects are Coordinators. Project managers, Engineers and Building contractors are Shapers. Project managers, Building contractors and Quantity surveyors are Monitor evaluators. Project managers, Quantity surveyors and Building contractors are Team workers. Engineers, Project managers and Building contractors are Implementers. Project managers, Architects, Building contractors and Quantity surveyors are Completer finishers. Finally, Project managers, Building contractors and Architects are Specialists. Architects are more of coordinators, than resource investigators and specialists, Quantity surveyors are more of monitor evaluators and team workers than resource investigators, and Building contractors can be referred to as monitor evaluators than team workers, implementers and specialists. Engineers are more of implementer than shapers.

Table 4: Performance of Professionals Using the Belbin Team Roles

Team roles	Architects		Quantity surveyors		Building contractors		Engineers		Project Managers		Average	
	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank
Plant	3.52	7	2.98	9	3.38	8	2.98	9	3.83	8	3.34	8
Resource Investigator	3.70	2	3.64	4	3.42	7	3.53	4	4.20	1	3.70	4
Co-ordinator	3.95	1	3.50	5	3.74	5	4.17	1	4.19	2	3.91	2
Shaper	3.17	8	3.05	8	3.31	9	3.33	8	3.57	9	3.29	9
Monitor Evaluator	3.07	9	3.81	1	4.40	1	3.71	3	4.02	6	3.80	3
Team Worker	3.63	4	3.81	1	3.75	4	3.35	7	3.88	7	3.68	5
Implementer	3.66	3	3.67	3	3.98	2	4.17	1	4.10	5	3.92	1
Completer Finisher	3.50	6	3.48	6	3.50	6	3.38	6	4.19	2	3.61	7
Specialist	3.55	5	3.26	7	3.79	3	3.52	5	4.12	4	3.65	6

V. DISCUSSION OF FINDINGS

The role of project team members in this research work was explained based on the level of their performance using the Belbin team roles. [12];[13] &[14] explained team roles based on the Belbin team roles which are: Plants, resource investigators, coordinators, shapers, monitor evaluators, team workers, completer finishers and specialists. Based on the these team roles, it was discovered that Project managers possess all of the team roles, they can be classified as plants, resource investigators, coordinators, shapers, monitor evaluators, team workers, completer-finishers and specialists because they are involved in all the facets of any construction project from start to finish.

Architects can be classified as coordinators, resource investigators and specialists, Quantity surveyors are more of monitor evaluators, team workers and resource investigators, Building contractors can be referred to as monitor evaluators, team workers, implementers and specialists. Engineers are more of implementer than shapers.

VI. CONCLUSION AND RECOMMENDATION

This study has explored areas of team building, construction team members, their preferred team roles their performance in construction projects. Architects can be classified as coordinators, resource investigators and specialists, Quantity surveyors are more of monitor evaluators, team workers and resource investigators, Building contractors can be referred to as monitor evaluators, team workers, implementers and specialists while Engineers are more of implementer than shapers. Each member of any team possess different personality roles, therefore a project manager must be able identify and invest into each member's personality roles so as to achieve success in any construction project.

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