Effect of Task-Force Team Formation on the Successful Completion of Research and Development Projects in Nigeria [1]

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Abstract

This study assessed the effect of Task-Force Team Formation on the Successful Completion of Research and Development (R&D) projects in Lagos State, Nigeria. The study objectives are to determine the level correlation between project taskforce team formation and delivery of R&D projects, to analyse the significance of factors considered in the formation of project team for R&D projects, and to determine whether level of productivity of project team members have significant effect on successful completion of R&D projects. Data were obtained through questionnaire administration to the selected research institutes in Lagos State, Nigeria using purposive sampling technique. Inferential techniques were employed for data analysis. The findings show that, formation of team member improve the performance of R&D projects, factors for the formation of R&D team are significant, and productivity of project team affects the successful completion of R&D projects. Hence the study recommends the adoption of cross-functional team formation method, adherence to the factors of team formation for improved productivity of the team and R&D project delivery.

Keywords: project delivery; team formation; task-force; research and development projects; research institutes.

1.0 Introduction

Research and development projects have been acknowledged to be an engine for national development through the creation of platform for technological development. Hence, Research and Development (R&D) is seen as the ability to conduct different type of research, used to create knowledge for product and technology development (Frascati, 2002). Human Resource allocation process has made significant impact in the Research and Development projects of research institutes, through working together of various individual with varieties of skill and knowledge. However, R&D project team could be formed independently to conduct research and produce

[1] How to cite this paper: Echeme, I. I. (2022). Effect of Task-Force Team Formation on the Successful Completion of Research and Development Projects in Nigeria; *PM World Journal*, Vol. XI, Issue III, March.

research output independently. The team could also be partly integrated as project activities are sequential, hence team efforts depend on the results the preceding partners reached during the previous stage. The team can equally be formed through full integration of project team and interrelate with each other in terms of activities and results.

Project teams are capable of increasing an organization's adaptability to dynamic environment, by dealing with complexities of working and production processes (Amir, Naz, Hafeez, &Ashfaq, 2014). Katzenbach (2003) pointed out that an effective team composed of a small number of people with complementary skills who are committed to a common purpose, established performance goals, and approach that hold themselves mutually accountable. One of the important elements in building effective teamwork is team formation. The team member formation is the first task to carry out in order to guarantee successful team performance (Guzzo, Hollenbeck, and DeRue, (2004), Kozanoglu and Fahri, (2009), Paris, Salas, & Cannon-Bowers, (2000). Guzzo et al. (2004) added that team formation describes matching personnel to team roles and responsibilities. Consequently, there are many author such as Venkatamuni and Rao (2010), Ahn et al. (2007), Tseng, Wang, & Ku, (2009) that have developed different types of technique for team formation, using multi-dimensional trust which shows that worthiness assessment have significant benefit in team formation. However Cann,-Jansen and Brinkkemper (2012), warned that this techniques lack a number of attributes, like the experience or expertise of potential team members, the project characteristics, and the functions of the team members. It should be noted that during team formation, there are several criteria that are considered which allow decision makers to select the criteria that match each team. With regard to this, Multi Criteria Decision Making (MCDM) is concerned with structuring and solving decision and planning problems involving multiple criteria, the purpose is to support decision makers facing such problems.

Although several approaches have been developed to standardize the process of team formation yet the problem of poor implementation of projects, especially, R & D projects still persist. So, this study provide insights into adopting the "best fit" practices as for the formation of taskforce members in the near future. The country stands to benefit since the improved performance of the team will enhance the positive completion of many R&D projects and contribute significantly to the growth of the Nigeria economy. This study will prompt policy makers to pay due attention to taskforce formation practices and the role of team members in the successful completion of a R&D projects in any Institute funded by the Government. Hence, this study is set to investigate into the possible effect of task-force team formation for prompt delivery of projects, especially, R & D projects in Lagos State, in order to improve the knowledge base of product and technological development in the State and Nigeria in general.

Problem Statement

Yes, agreed that projects most times require project teams to manage successfully, but unfortunately, most of these projects have been seen to witness fatigue which result to their failure and subsequent abandonment. As a result, the objectives are not realized and the economic

benefits a mirage. This is the case of most R&D projects in Nigeria. Little or no regards have been given to project taskforce as a special and formidable team that will ensure that projects, especially, R&D projects are successfully actualized and the output impacted on the economy.

However, literatures review show that the process of how human resource are allocated to different projects and the motives behind the allocation practices have not received much attention in many organizations, leading to the poor achievement and failure in completing project activities within scope, time and cost. Typically, a project manager or team leader is appointed and team members are selected based on factors such as competency, position in the existing structure, loyalty or ability to work with others, while the team leader directs the activities of the team members. Unfortunately, the formations of project team member, in most cases, are usually based on sentiments, friendship and power tussle which negatively affect prompt project delivery in most R&D organizations. It is therefore important to examine the formation and application of taskforce team in the successful completion of R&D projects of Nigeria Research Institutes for technological and economic development.

Objectives of the Study

The main objective of this study is to examine the effect of taskforce team formation on the successful completion of R&D projects in Lagos State. To achieve this, the specific objectives include to:

a. Determine the level correlation between project taskforce team formation and performance of R&D projects.
b. Compare the formation processes of project team member for R&D projects in different research institutes in Lagos state, Nigeria.
c. Identify and analyse the significant factors considered in formation of project team member for R&D projects.
d. Determine whether level of productivity of project team members have significant effect on successful completion of R&D projects.

In order to answer the research questions and achieve the objectives of the study, the following hypotheses have been formulated for testing;

H_{01}: There is no significant correlation between formations of project team member to the successful completion of R&D project.

H_{02}: There is no significant difference in selection processes of project team member for R&D projects in different research institutes in Lagos state.

H_{03}: The factors considered in selecting project team member for R&D project have no significant effect on the delivery of R&D projects.

H_{04}: The level of productivity of project team member cannot significantly affect the successful completion of R&D projects.

Scope of the Study

The scope of the study focused on the activities of three (3) research institutes in Lagos State. They are; Federal Institute of Industrial Research Oshodi (FIIRO), Nigerian Institute for Oceanography and Marine Research (NIOMR) and the National Institute for Medical Research (NIMR). These research institutes have headquarters in Lagos, Nigeria are FIIRO and NIOMR. They are chosen for this study because they are involves in Basic and Applied Research projects, and carried out R&D projects with formation of task force team member. FIIRO is involved in applied research, NIMR is involved in both the basic and applied research and NIOMR is involved in applied research. These research institutes are certified worthy for the research due to the level of R&D projects currently being implemented and the effect of the projects on the economic development of the nation. The Figure 1 below show the location of these R&D Institutes in Lagos.

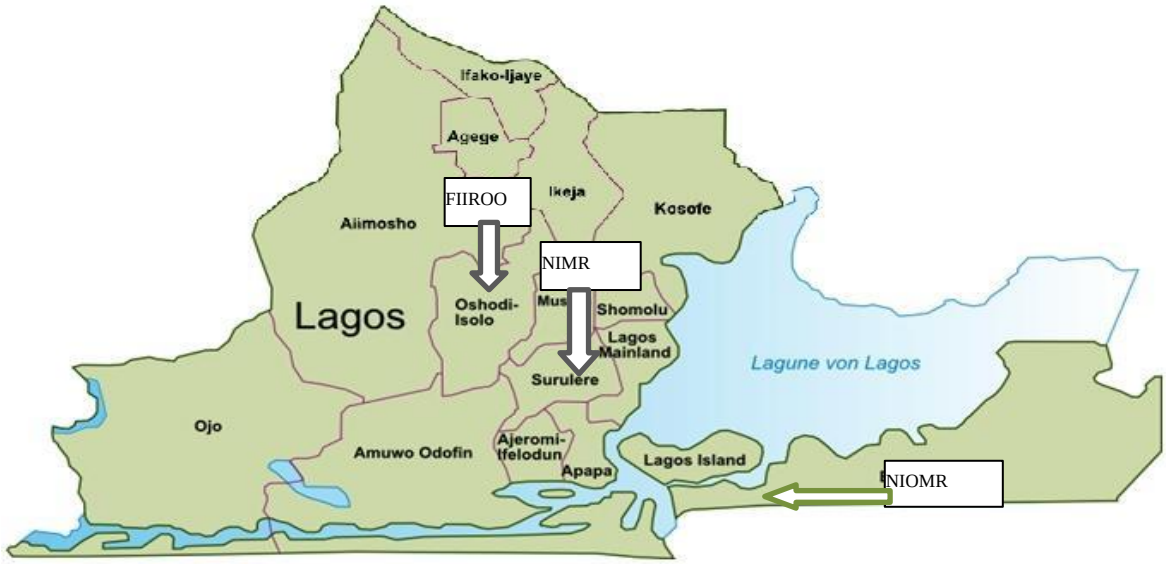

Figure 1. Map of Lagos State Showing the Location of FIIRO, NIMR and NIOMR

2.0 Conceptual Review

During the last century, R&D management as an innovation stimulator has passed the evolution of five (5) generations, characterised by simultaneous progress of handling R&D activities (Chiesa, 2018). The complex attitude to the effective management of R&D according to a wide

variety of management targets turns the R&D management process into multidimensional tasks. Every new generation adds an extra managerial task to the list of manager duties. The first generation of R&D management was expressed by corporate lab creation. The second generation emerged when R&D was incorporated into the entire business system. The third generation is represented by R&D project management and portfolio management. The fourth generation put suppliers and customers on the R&D management scene, while the next generation consists of a network of innovation actors and stakeholders (Hartenian, 2013).

R&D management derives from knowledge management, while being responsible for the creation of new materials, processes and technologies, R&D seeks to respond to societal and market needs, when the society and the market shape the trend of R&D. Therefore, knowledge about society's expectations as to the new R&D products shapes R&D (the concept of product or process design). In the chain of knowledge management, R&D has a role of primary source of knowledge, so that R&D management and knowledge management concepts have the same origin. R&D management has survived different practices and developed management principles that evolved over time. The changes of approach to R&D management could be divided to sequences of time series called generations. The transformations represented by generations are more evolutionary than revolutionary, as external changes and new challenges push to seek for new lines of action and generate new understanding that could be called R&D outputs and the new ways to enhance R&D productivity. By screening the main drivers of change in every new R&D management generation, the main determinants can be listed: the demand to speed up R&D output creation. Earlier, R&D was driven by human curiosity and willingness to explore the dark part of knowledge. By reason of such attitudes, in the R&D goals and the time needed for developing the final product were not interrelated. Meanwhile, external market pressure, growing competition, the primacy of business practice, globalisation created a positive environment to speed up R&D evolution with the creation of a new R&D management model (Marques & Ochoa, 2014).

Research and Development (R&D) Projects

According to Frascati (2002), Research and Development (R&D) is an ability to conduct different type of research and use created knowledge for product and technology development. It is a pure research and innovative activities together with rational use of costs and optimisation of products. The activities of R&D could be attributed to: Basic/applied research; Ability to maintain state-of-the-art knowledge; Technical forecasting ability; Well-equipped laboratories; Proprietary technical knowledge; Innovative and creative environment; Offensive R&D capability; Defensive R&D capability; Ability to optimise cost with performance.

The value of R&D is highlighted in every strategic plan of every European country and within EU policies. In Europe, R&D is conducted in both public and private organisations with governmental support (Marques and Ochoa, 2014). In the last decade the majority of research initiatives were

funded for the development of technology-oriented projects and few initiatives were supported for fundamental research. This proportion is very clear in the USA and finds certain expression in Europe and is different in regard to fundamental research, when additional funds are allocated to support new ideas, whereas technological development extends the needs to keep pace with the support of private initiatives (Frascati, 2002).

Project Teams

Katzenbach (2003) defines a project team as a group of people with complementary skills who are committed to a common purpose, performance goals, and approach for which they hold themselves mutually accountable. The expansive emotional environments that are cultivated by building positivity during the forming stages of the team and transcends through to the way in which the team adjourns differentiate a project teams from other group. The leader and team members experience and express positive emotions enhancing performance outcomes at the individual and group level (Barsade & Gibson, 2007). Project team embrace appreciative approaches to working together; focusing on strengths and generative opportunities as opposed to just problems, conflict, defensiveness and win-lose approaches. A project team has the characteristics of good morale (Peterson, Park, & Sweeney, 2008) including confidence, enthusiasm, optimism, resilience, mutual trust and respect, loyalty, leadership, and social cohesion.

Accelerating the formation of contemporary project teams requires a new, perhaps counter-intuitive, way of thinking about teams. Traditional approaches tend to focus on what is wrong with teams and why they fail, then seek to close the gaps and fix the weaknesses.

Type of Project Team

According to Branislav (2017), there are four main types of project teams:

a. Functional teams

These teams are permanent and always include members of the same department with different responsibilities. A manager is responsible for everything, and everyone reports to him. These types of teams are more likely to be found in companies that incorporate traditional project management. Sometimes, in order to complete a project, several departments need to work together. For example:

i. Work on the new product starts with the idea from marketing department;
ii. The idea is passed down to research and development to determine its feasibility;
iii. After R&D, the design department is tasked with giving it an appealing look and feel;
iv. Finally, the product is made by manufacturing department.

This type of approach is known as ‘baton passing’ as posited by (Branislav, 2017). It requires a manager that has an oversight of the entire project and ensures that there are no obstacles when it comes to transferring work from one team to another. However, this type of project team formation

research is used in Federal Institute of Industrial Research Oshodi (FIIRO) and Nigerian Institute for Oceanography and Marine Research (NIOMR).

b. Cross-functional teams

Cross-functional teams are made up of members from various departments. These teams tackle specific tasks that require different inputs and expertise. Though cross-functional teams are becoming increasingly popular worldwide, a recent study has proven that whopping 75% of all cross-functional teams are dysfunctional (Branislav, 2017). This type of project team formation research is used in National Institute for Medical Research (NIMR).

c. Matrix teams

These teams are characterized by a "two-boss system", where an individual report to a different manager for various aspects of his work. This type of team is the product of Matrix management approach. While this approach helps the top management retain control over the project without being included in day-to-day decisions, employees are often faced with challenges of dual command.

d. Contract teams

Contract teams are outsourced teams that are tied down by a contract and brought in to complete a part of a project. After the project is completed and the contract has ended, the client can cut all ties to the team, no questions asked. The project manager is the key to success when it comes to contract teams. As posited by Branislav (2017), project manager has to: maintain constant communication between the team and the client, compensate for the lack of team's physical presence (given that most contract teams work remotely), and bear full responsibility for success or failure of a project. This type of project team formation research is also used in National Institute for Medical Research (NIMR).

Research and Development (R&D) Project Team Formation

R&D activities are customary for both the public and the private sector. Global competition turns companies to seek for more innovative ways to survive. More and more complex R&D-based activities are introduced into business schemes not only by high technology companies, but also by low and medium-technology companies. On one hand, public R&D institutions can stand outside global competition for new added value solutions easier than businesses, while competition for new ideas is nevertheless the driver for public R&D (Branislav, 2017).

Although some managerial differences still exist between R&D management practice in a private company and in a public R&D institution, a unified approach is applied and R&D nature requires special managerial dealing. When introducing R&D management measures, one should take into consideration the background of public institutions who act in a less competitive environment, possibly leading to: less tension; less stressful environment; and resulting in a less innovative output.

R&D project team management approach could differ depending on the cooperation that is needed for the research project. According to Chapman (2016), there are 3 types of team formation in R&D.

i. Pool interdependency. Team members are almost independent from each other, especially in terms of research results. They conduct research independently and produce research output independently. The cooperation lays down on coordination management. The most common example of using such cooperation in practice is EUREKA programme of the EU.

ii. Sequential interdependence. Project team is partly integrated as project activities are sequential and follow each other, so member efforts depend on the results of the results of the other partners reached during the previous stage.

iii. Reciprocal interdependence. Team member are fully integrated in the project team and interrelated with each other in terms of activities and results. This type of project needs active management technique.

2.1 Theoretical Review

Various team effectiveness studies have resulted in team effectiveness models. Team effectiveness models included in this section looked specifically on teams, in general, as there is not much literature on the team effectiveness model in construction projects. Several studies identified sets of variables or constructs used to determine team effectiveness (Werner and Lester 2001; Mannix and Neale 2005). Therefore, it is relevant for this study to examine various team effectiveness models to determine team effectiveness factors that can be used to develop assessment tools for this study.

Normative models of team effectiveness according to Hackman (1987) emerged in the late 1980s and emphasized points of leverage that practitioners and researchers could employ to influence team effectiveness. According to Salas et al. (2009), input-process-output (IPO) theory was fundamental in the early development of team effectiveness models. IPO theory predicts input factors, such as team and individual characteristics, function through mediators or moderators to influence outputs, such as team satisfaction and performance.

Rasker, van Vliet, van Den Broek, &Essens. (2001)

The model proposed by Rasker et al. (2001) is a theoretical frame work that comprises five different factors resulting in effective teamwork. Situational factors, such as uncertainty, dynamism, and time stress, are factors that come from outside the team and are affected by the environment. Organizational factors are determined from outside the team, such as organization, which offer social support and reward system, as well as outlining the overall mission, objectives, and goals of a project's team. To ensure the team's missions are achieved, the team should possess good structure and cohesion among its team members, as well as providing a good leadership function throughout the entire project.

Moreover, each team member should possess Knowledge, Skills, and Attitudes (KSA) to ensure all tasks and activities are completed successfully and efficiently. The model imposes different task factors, such as complexity, structure, interdependency, and load, for teams to achieve their goals. In addition, teamwork is the important factor that ties-in all factors. It is comprised of two kinds of behavioural activities—task-related activities and team-related activities—where task activities include all of those individual behaviours directly related to the job at hand and team activities include communication and coordination.

Blendell, Henderson, Molloy, & Pascual. (2001)

The Blendell et al. (2001) model is setup according to the input-process-output (IPO) structure, where each factor (input, process, and output) comprises several different functions. There are six functions considered important as input factors for overall team effectiveness; leadership style, experience, team composition, degree of distribution, aptitude and personality, and operating and procedures. The input factors, combined with knowledge, leadership, behaviours, and attitudes from the process stage, will produce outcome factors, which are timely, accurate, and fulfil overall team satisfaction. The model illustrates clearly the different functions under each of the factors and does not take into consideration other factors, such as environment and individual characteristics.

2.2 Empirical Study

A 2006 poll by the Center for Creative Leadership (CCL) showed 83% of the 286 respondents identified teams as a key ingredient to organizational success (CCl, 2006). As employees spend increasing time working in temporary teams, team satisfaction may represent an important variable in employee job satisfaction, ultimately impacting organizational outcomes such as turnover and organizational citizenship (West et al., 2009). All these factors support the need for more effective and expedient methods to establish strong interpersonal team dynamics during team formation.

Omar and Syed-Abdullah (2010) demonstrated that an effective team needs to have more extrovert members. Therefore, application of Analytic Hierarchy Process (AHP) for selecting the most suitable extrovert team leader can improve performance of team in group work project in educational field due to the team leader plays an important role in the success or failure of the team (Gilley et al., 2010; Rong and Shao, 2012). Ku et al. (2013), argued that team work satisfaction involves understanding the team's interaction and process from the perspective of the team participants themselves. In addition, the teamwork satisfaction scale has been shown to demonstrate desirable factorial validity and internal consistency with the selected student population.

In Kurtzberg's study (2000) where he investigated the relationship of diversity, creativity, and conflict, results showed that a mix of creative and non-creative people leads to higher levels of creative performance, but at the expense of team member satisfaction. However, many empirical studies have also revealed that higher levels of diversity lead to higher satisfaction and motivation and thereby to higher quality team output (Kurtzberg, 2000).

2.3 Literature Gap

Research institutions are heterogeneous in terms of organisational structure, budgeting source, and the way they report for support. Research is conducted in universities, research institutes, and private companies. The personnel of such institutions are also very heterogeneous in terms of nationality. Hence, R&D projects are more based on cooperation from different expertise in various fields because of the complexity nature of R&D projects. Cultural differences, language and political orientation have a direct impact on team formation. Many authors have identified various method of team formation, but none has been able to identify the method used in team formation for R&D construction projects in developing countries. Therefore, this research is set to fill this gap and provides the methods of team formation for R&D construction projects in research institutes domicile in developing country like Nigeria.

3.0 Research Methodology

The researcher collected data for the research from both primary and secondary sources using a structured approach. This study therefore, utilized a survey research design because of the type of information needed. Survey research is one which involves the assessment of opinion, beliefs, attitudes and motivation using questionnaire and sampling techniques. The researcher used data collected from personnel involved in R&D projects who responded to a set of questions on various formation of task force team. Also data were collected from completed R&D projects in these research institute for analysis using a multivariate statistical technique like correlation analysis, Analysis of Variance (ANOVA), t-test, etc.

3.1 Population of the Study

The target population for the study were researchers in Federal Institute of Industrial Research Oshodi (FIIRO), Nigerian Institute for Oceanography and Marine Research (NIOMR) and the National Institute for Medical Research (NIMR).The population of researchers in FIIRO, NIOMR and NIMR are 223, 163 and 210 respectively. The total population size of the three research institute considered in this study is five hundred and ninety six (596) active participants in the R&D projects under consideration.

Sampling Size

A total of 239 respondents from FIIRO, NIOMR, NIMR were administered questionnaires for this research using stratified random sampling technique. This is made up as follows: FIIRO 89 respondents, NIOMR 66 respondents and 84 NIMR respondents. This was done using Taro Yamane sample size formula. The formula is stated below:

$$\dot{n} = \frac{N}{1 + N\,(e)^{2}}$$

Where;

n = Sample size, N = Total Population, e = Acceptable error limit (0.05) and 1 = Unity (it is constant)

Placing the information in the formula at 596 population size and error limit of 5% result in:

$$n = \frac{596}{1+596(0.05)^2} = 239$$

To assign/allocate the sample size of 239 to researchers in FIIRO, NIOMR and NIMR, the researcher used the Bourley's Proportional Allocation formula:

$$nb = \frac{n(h)}{N}$$

Where:

nb = Bourley formula

h = Element within the sample frame.

n = Sample or proportion of the universe used for the study (total sample size)

N = Population of the study.

Inputting the value into the Bourley formula;

FIIRO $= \frac{223 \times 239}{596} = 89$

NIOMR $= \frac{163 \times 239}{596} = 66$

NIMR $= \frac{210 \times 239}{596} = 84$

3.2 Method of Data Collection

Two main sources of data were used for this research: the primary and secondary sources. To generate the required data for this study, the researcher recognized the following secondary sources: Public and Private Libraries; Internet project related sites; journals; research reports, research and development institutions in Lagos state, etc.

To extract the primary data, the researcher used structured questionnaires administered to personnel directly involved in the projects and taskforce team formation in these research institutions. Direct administration of this questionnaire was done to allow for free interaction between the researcher and the respondents. The research instrument consist two sections, the personal data section and the section on the effect of task-force team formation on R&D projects. The personal data section is made up of such demographic characteristics like highest educational qualification, years of experience, and position. The second section on the effect of task-force team formation on research and development projects, had some questions with alternative answer to choose and 5 points Likert Scale statements was used based on the study objectives. The responses are Strongly Agree (SA), Agree (A), Undecided (U), Disagree (D) and Strongly Disagree (SD). For positive statements the scores are 5, 4, 3, 2 and 1.

Validity of the Research Instrument

In order to ensure the validity of the research instrument, proper structuring of the questionnaire and a conduct of a pre-test of all the questions contained in the questionnaire were carried out. However, the researcher used content validity to ensure the validity of the instrument.

Reliability Test

The researcher employed the test-retest method so as to obtain the reliability of the research instrument. To do this, the researcher ensured that the same questionnaire items were administered to a selected group of employee in FIIRO, NIOMR and NIMR on one occasion and after fifteen (15) days, administered the same questionnaire items to the same group in order to ascertain the level of correlation between the two sets of scores obtained. The researcher employed the Spearman's rank correlation coefficient denoted as $\mathbf{r^1}$ to determine the strength of the relationship and this is stated as:

$r^1 = 1 - \frac{6\sum d^2}{n(n^2-1)}$ Where: d = difference between any pair of rank; and n = number of data pairs

The test was conducted among a group of 239 staff of the organizations under study, and the difference obtained from the two sets of test was 174. By substituting into the formula, we have:

$r^1 = 1 - \frac{6(174^2)}{239\,(239^2-1)} = 0.993$

Since the correlation coefficient is 0.993, it signifies that there is high level of correlation between the two sets of test administered. As a result, we conclude that the research instrument is reliable.

3.3 Method of Data Analysis

Pearson's correlation analysis was adopted in testing hypothesis one, while Analysis of Variance (ANOVA) were used to test the acceptability or otherwise of the hypothesis two. Also, the pair sample t-test was adopted in testing hypotheses three and four. All the hypotheses were tested at 5% level of significance.

Decision Rule: Reject the null hypothesis (H_0), if calculated value is greater than the critical value of the statistical tool that tested at 5% level of significance. Do not reject H_0, if otherwise.

4.0 Results and Discussions

A total of eighty nine (89) questionnaires were distributed to researchers at FIIRO, the total number of responses received for this analysis was seventy one (71) representing 80% effective response rate. Also, a total of sixty six (66) questionnaires were distributed to researchers at NIOMR, and the total number of responses received for this analysis was forty four (49) representing 74% effective response rate. Also, a total of eighty four (84) questionnaires were distributed to researchers at NIMR, and the total number of responses received for this analysis was sixty four (64) representing 76% effective response rate. This is presented in table 1 below.

Table 4.1: Respondent's response rate

Selected R&D Institutes	Distributed Questionnaires	Questionnaire Returned	% Returned Questionnaires
FIIRO	89	71	80
NIOMR	66	49	74
NIMR	84	64	76

4.1 Hypothesis Testing

Hypothesis One (H_{01}): There is no significant relationship between formations of project team member and the successful completion of R&D project.

Table 4.2: Paired Samples Correlations (FIIRO)

	Frequency	Correlation	Significance value
Method of team formation & project team performance	71	0.751	0.001

The Table 4.2 show that the correlation value for FIIRO is 0.751, with the probability value (significant value) of 0.001. The correlation value shows that the level of correlation is significant because the correlation value (0.751) is closer to 1.

Table 4.3: Paired Samples Correlations (NIOMR)

	Frequency	Correlation	Significance value
method of team formation & project team performance	49	0.594	0.013

The correlation value for NIOMR is 0.594, with the significant value of 0.013. The correlation value shows that there is a significant positive correlation between team formation and project performance.

Table 4.4: Paired Samples Correlations (NIMR)

	Frequency	Correlation	Significance value
method of team formation & project team performance	64	0.704	0.020

The correlation value for NIMR is 0.704, with the probability value (significant value) of 0.020. The correlation value shows that there is a significant positive correlation between team formation and R&D project performance.

Based on the results in Tables 4.2 to 4.4, the null hypothesis, H_{01} is rejected and the alternative hypothesis H_{A1}: There is significant relationship between formations of project team member and the successful completion of R&D project, is accepted.

Hypothesis Two (H_{02}): There is no significant difference in selection processes of project team member for R&D projects in different research institutes in Lagos State.

Table 4.5: ANOVA

	Sum of Squares	Degree of freedom	Mean Square	F	Sig.
Between Groups	4.601	1	4.601	7.483	.007
Within Groups	100.211	163	.615		
Total	104.812	164			

The statistics in Table 4.5 showed the F-value of 7.483 which is significant at 0.007 level of significance implying that at 0.05 level of significance, hypothesis two is significant. Hence, the null hypothesis is accepted showing that there is no difference in selection processes of project team member for R&D projects in different research institutes in Lagos State, Nigeria. Since the objectives of these research institutes are the same, there is no doubt that the selection processes of team members are the same.

Hypothesis Three (H_{03}): The factors considered in selecting project team member for R&D project have no significant effect on the delivery of R&D projects.

Table 4.6: Paired Sample t-test for FIIRO

	Paired Differences		t	df	Sig. (2-tailed)
	Mean	Std. Deviation			
Technical Knowledge - Team Performance	3.317	.563	46.772	62	.000
Years of experience- Team performance	2.000	.718	22.096	62	.000
Good commitment- Team performance	2.635	.885	23.621	62	.000
External influence- Team performance	2.333	.933	19.845	62	.000
Previous relationship - Team Performance	2.302	.854	21.379	62	.000

The t-test result in Table 4.6 show that all the factors considered in selecting project team members for R&D projects are significant.

Table 4.7: Paired Sample t-test for NIMR

	Paired Differences		t	df	Sig. (2-tailed)
	Mean	Std. Deviation			
Technical Knowledge - Team Performance	3.500	.682	39.093	57	.000
Years of experience- Team performance	1.655	.690	18.280	57	.000
Good commitment- Team performance	3.500	.960	27.774	57	.000
External influence- Team performance	2.879	1.156	18.971	57	.000
Previous relationship - Team Performance	2.276	1.295	13.384	57	.000

Table 4.7 show that t-test values of 39.093, 18.280, 27.774, 18.971 and 13.384 are significant at 0.000 level of significance respectively

Table 4.8: Paired Sample t-test for NIOMR

	Paired Differences		t	Df	Sig. (2-tailed)
	Mean	Std. Deviation			
Technical Knowledge - Team Performance	3.795	.553	45.510	43	.000
Years of experience- Team performance	3.500	1.000	23.216	43	.000
Good commitment- Team performance	1.795	.765	15.570	43	.000
External influence- Team performance	2.636	.990	17.656	43	.000
Previous relationship - Team Performance	3.023	.731	27.429	43	.000

The Table 4.8 shows the t-test statistics, values are significant at 0.000 level of significance meaning that at 0.05 level of significance, all the factors considered in selecting team members at NIOMR have significant effect on the delivery of R & D projects.

Therefore, the null hypothesis, H_{03} is rejected with the conclusion that the factors considered in selecting project team member for R&D project have significant effect on the delivery of R&D projects. This result depicts reality as these five (5) identified factors are the major factors considered in selecting a formidable team to handle projects like research and development projects which are mostly technological based.

Hypothesis Four (H_{04}): The level of productivity of project team member cannot significantly affect the successful completion of R&D projects

Table 4.9: Paired Sample t-test for FIIRO

	Paired Differences		t	df	Sig. (2-tailed)
	Mean	Std. Dev.			
Thoughtful feedback – Period of project completion	1.095	.665	13.070	62	.000
Supportive of project - Period of project completion	0.603	.730	6.554	62	.000
Trust others judgment - Period of project completion	1.683	.930	14.356	62	.000
Plenty of communication - Period of project completion	1.508	.998	11.993	62	.000
Team member takes initiative - Period of project completion	1.111	1.220	7.231	62	.000
Everyone is focused on the project - Period of project completion	0.873	.707	9.802	62	.000

The level of productivity of the team members are significant to successful completion of R&D projects in FIIRO Lagos State. We reject the null hypothesis.

Table 4.10: Paired Sample t-test for NIMR

	Paired Differences		t	df	Sig. (2-tailed)
	Mean	Std. Dev.			
Thoughtful feedback – Period of project completion	.069	.856	0.614	57	.542
Supportive of project - Period of project completion	.017	.713	0.184	57	.855
Trust others judgment - Period of project completion	1.276	.121	0.670	57	.502
Plenty of communication - Period of project completion	0.793	.166	0.179	57	.871
Team member takes initiative - Period of project completion	0.052	.887	0.444	57	.659
Everyone is focused on the project - Period of project completion	0.086	.683	0.962	57	.340

At NIMR, Lagos State the level of productivity of the team members are not significant to successful completion of R&D projects. We accept the null hypothesis.

Table 4.11: Paired Sample t-test for NIOMR

	Paired Differences		t	df	Sig. (2-tailed)
	Mean	Std. Dev.			
Thoughtful feedback – Period of project completion	0.250	1.059	1.565	43	.125
Supportive of project - Period of project completion	0.159	.861	1.225	43	.227
Trust others judgment - Period of project completion	0.295	1.112	1.763	43	.085
Plenty of communication - Period of project completion	0.091	1.326	0.455	43	.652
Team member takes initiative - Period of project completion	0.386	1.755	1.460	43	.151
Everyone is focused on the project - Period of project completion	0.250	.991	1.673	43	.102

The t-statistics in Table 4.11 showed that the level of productivity of project team member cannot significantly affect the successful completion of R&D projects at 95% confidence level. Therefore, we accept the null hypothesis.

5.0 Conclusion

The study concludes with the following recommendations;

i. The study recommend that research institutes should adopt cross-functional team formation method based on the complex nature of their projects or develop a strategy for the formation of project team member to R&D project. Team members should be selected or formulated based on the knowledge for the project from various departments within or outside the organization. This will ensure appropriate guideline to be followed during team formation process.

ii. Since the relationship between team formations is significant to R&D project success, project management office should be established in various research institutes to directly manage projects to ensure prompt delivery and performance of R&D projects.

iii. Management of research institutes should ensure that criteria for formulating project team members in their institutes should not be compromise with influence, but based of technical knowledge and years of experience, commitment, previous relationships devoid of external influence. This will help in improving R&D projects delivery and ensure efficiency, collaboration, and opinion diversity in R&D projects.

iv. In order to improve the level of productivity of project team members for successful completion of R&D projects, there should be timely and thoughtful feedback, strong support for the project, trust for other team member's judgment, frequent communication with team members taking initiative and focus on the project outcome.

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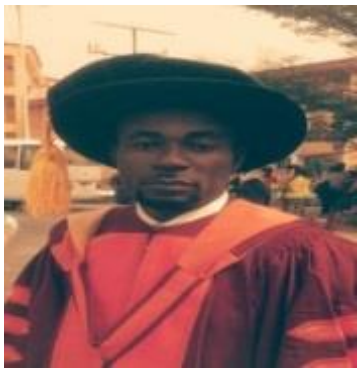

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