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(RESEARCH ARTICLE)

Examining the role of virtual teams on project management processes in the Nigerian fintech sector

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Abstract

This study examined the role of virtual teams on project management processes in the Nigerian fintech industry. To achieve this aim, the study sought to examine how communication technology utilisation, trust, and geographical distribution of team members affected the project management processes of virtual team members in the Nigerian fintech industry. Building upon the theoretical frameworks of social presence theory and transaction cost theory, the study adopted a quantitative approach and used a sample of 385 employees of fintech firms in Nigeria. Using an electronic close-ended questionnaire (Google forms), data were collected from 378 participants, indicating a response rate of 98.2%. Purposive sampling technique was used to select the study's participants. Data were analysed using both descriptive (frequencies and percentages) and inferential statistics (multiple linear regression) via the aid of STATA 17. Findings from the study revealed that communication technology utilization ($\beta = 0.3114694$, $p < 0.05$) and geographical distribution of team members ($\beta = 0.7622249$, $p < 0.05$) both had statistically significant effects on project management processes. Trust was found to have an insignificant effect on project management processes ($\beta = -0.0085031$, $p > 0.798$). The study concluded that virtual teams significantly and positively affects project management processes in the Nigerian fintech industry, and recommends that firms in the industry should continue with the use of virtual teams in their given projects. Also, the study recommends that policies regarding work in the virtual environment should be formalised so as to maximise the benefits associated with virtual work.

Keywords: Virtual team; Communication technology utilization; Trust; Geographical dispersion of team members; Project management processes

1. Introduction

The role of virtual teams in the project management process has become increasingly significant. The use of virtual teams has been brought by recent advancements in technology and recent developments like the COVID-19 pandemic (Chai & Park, 2022). This has transformed the ways people engage themselves within project teams. The increased adoption of virtual teams in modern organizations presents both opportunities and challenges for project management processes.

In Nigeria, the fintech sector has experienced substantial growth, driven by innovations in digital financial services, increasing internet penetration, and the demand for convenient and accessible financial solutions (Ezeocha, 2024). This growth has brought about changes in the way project management processes are conducted, as organizations increasingly rely on virtual teams to execute projects.

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Virtual teams, defined as members of a team that have very little face-to-face interaction due to the use of computer-mediated communication technologies (Mwamba & Malik, 2022). There are several advantages associated with this type of teams, which include, cost savings, flexibility, and the ability to harness a wide range of perspectives and skills. Nevertheless, there are some disadvantages associated with it such as, cultural differences, difficulties in building trust and cohesion, and communication barriers (Morrison-Smith & Ruiz, 2020).

With respect to the Nigerian fintech sector, projects are usually associated with technology-driven, complex, and effective management of virtual teams, which are crucial for success. The dynamic environment in which the sector is situated necessitates agile project management approaches, where virtual teams can easily adapt to the constantly changing market conditions and technological advancements (Amjuoyi, Benjamin, & Adeusi, 2024). Regardless of the potential benefits, there exists a growing need to understand the dynamics behind the impact virtual teams have on project management processes in this context.

Recent studies look at the role of virtual teams and the opportunities and challenges that they present for project management processes in modern organisations (Abarca et al., 2020; Bernat et al., 2023; Mwamba & Malik, 2022). Technological advancements enable virtual team collaboration and it is expected to see increased adoption in the foreseeable future, driven by expectations of future pandemics and potential cost savings in transportation (Abarca et al., 2020). Just like traditional teams, virtual teams maintain stakeholder engagement, facilitate knowledge-sharing and contribute to sustainability in project management without diminishing their impact on project success (Bernat et al., 2023). Project management virtual teams have some advantages such as decreased workload, adaptable scheduling, lowered stress levels, flexibility in travel and relocation, decreased involvement in office politics, and the choice to reside in any desired location among others (Mwamba & Malik, 2022). It also comes with challenges such as isolation and confusion; developing trust; ensuring performance, diversity and virtual work-cycle management; and differences in culture and differences in time zones (Mwamba & Malik, 2022). These studies show that virtual teams have not caused less efficiency in project management.

Due to the increased prevalence of virtual teams in organizations today, there is an increased need to investigate their role in project management and their complexities and identify strategies to optimize their effectiveness. There exists a paucity of research focusing on this phenomenon of interest. However, previous studies that seem to have come near the exploration of this phenomenon just focused on the role virtual teams play in project management, and how project management affect virtual teams (Mwamba & Malik, 2022; Rehman et al., 2021; Ybañez, Bautista, & De La Cruz, 2022). Many of these studies did not focus on an empirical exploration of the effect of virtual teams on the processes of project management.

This study aims to address this gap by examining the influence of virtual teams on various aspects of project management processes, including clear and well-defined project goals, efficiency, project deadlines, overall project quality. This study will contribute to existing literature by shedding light on virtual teams in project management. This will help to educate project managers and researchers about the nuances of executing projects with virtual teams. It will also provide useful insights towards optimizing project outcomes in virtual teams.

1.1. Research Question

The following are the research questions this study aims to answer:

- RQ1: What is the role of virtual teams in enhancing the project management processes in the Nigerian fintech sector?
- RQ2: How does communication technology utilization affect the project management processes in the Nigerian fintech sector?
- RQ3: What is the effect of trust on the project management processes in the Nigerian fintech sector?
- RQ4: To what extent does geographical distribution of team members affect project management processes in the Nigerian fintech sector?

1.2. Research Objectives

The broad objective this study aims to achieve is to examine the role virtual teams play on project management processes in the Nigerian fintech sector, while its specific objectives include:

- To examine how communication technology utilization affects the project management processes in the Nigerian fintech sector.
- To assess the effect of trust on the project management processes in the Nigerian fintech sector.

- To evaluate the extent to which geographical distribution of team members affect project processes in the Nigerian fintech sector.

1.3. Research Hypotheses

- H_{01}: Virtual teams negatively affect project management processes in the Nigerian fintech sector.
- H_{02}: Communication technology utilisation does not have a significant effect on the project management processes in the Nigerian fintech sector.
- H_{03}: Trust does not have a significant effect on the project management processes in the Nigerian fintech sector.
- H_{04}: Geographical distribution of team members does not significantly affect project processes in the Nigerian fintech sector.

2. Literature review

2.1. Conceptualising Virtual Teams

Several definitions of virtual teams exist. According to El Idrissi and Fourka (2022), virtual teams (VTs) are groups of people who work interdependently with a shared purpose across space, time, and organization boundaries, using technology to communicate and collaborate. In the words of Morrison-Smith and Ruiz (2020), virtual teams are central to maintaining our increasingly globalized social and economic infrastructure. The use of virtual teams allows organizations to enrol key specialists, regardless of their physical location. Also, A virtual team is a new form of work organization based on information technology, bringing together individuals with common goals or common interests to form a team (Zhang, 2022). Kukytė (2021) posited that a virtual project team is a team with geographically dispersed members whose communication is maintained in a virtual environment of computer technology, the team members are culturally diverse, and the operation of the team itself is defined in terms of time.

These definitions show the evolving nature of contemporary organizations and the increased use of virtual teams for effective collaboration, and also show the importance of Information Technology (IT) in making this possible. Furthermore, it shows the ability of virtual teams to overcome constraints such as physical location, thus enabling organizations to utilize specialized talents regardless of where they are.

The emergence of virtual teams is a response to the demands of global competition and the necessity for employees to engage in increasingly intricate and innovative tasks within organizations (Nemiro, 2023). It has led to decreased workload, adaptable scheduling, lowered stress levels, flexibility in travel and relocation, and the choice to reside in any desired location among others (Mwamba & Malik, 2022). These teams facilitate collaboration among members using technology, transcending barriers of time, geography, and culture (Nemiro, 2023).

It also comes with its challenges. This includes geographical distance, temporal distance, perceived distance, the configuration of dispersed teams, and diversity of workers (Morrison-Smith & Ruiz, 2020). This also includes isolation and confusion; developing trust; ensuring performance, diversity and virtual work-cycle management; and differences in culture and differences in time zones (Mwamba & Malik, 2022).

2.2. Parameters of Virtual Teams

2.2.1. Communication Technology Utilisation

The last few decades have seen organizations adopt virtual teams to complete projects to exploit knowledge without needing to relocate employees (Gibbs, Sivunen, & Nordback, 2021). Virtual teams are defined by the use of information and communication technologies, by their dispersed geographic location and temporary nature, and are often assigned to closed projects. Communication Technology has indeed become an integral part of how work is done in an organization especially in virtual teams. The growth and development in the use of information and communications technologies (ICT) is growing at a rapid rate across the world. (Vida, Majzoub, & Meidute-Kavaliauskien, 2020). Virtual teams are also an important component of agile systems by contributing team members to work more efficiently, to collaborate and to share skills (Sampaio, Bastos, & Marinho, 2021).

Technology, particularly information systems and computer mediated communication technologies have been rapidly evolving (Velez-Calle, et al., 2020). Technology is the anchor sustaining virtual team's communication. However, the selection of proper tools is crucial to achieve success (Lumseyfai, 2020). The increased presence of technologies in the

workplace has encouraged employees and organizations to acquire new competencies to face challenges related to organizational transitions, such as those created by telework and hybrid work (Deschenes , 2023).

In the workplace, digital literacy allows employees to access, retrieve, and critically analyse information transmitted and collected through digital technologies (Nikou, De Reuver, & Mahboob Kanafi, 2022). However, there needs to be caution in the utilization of technology. The complexity of the technological tools can be a handicap to create effective virtual teams, this is why it is so important that members are trained on the technologies what will be used (Dumitrașcu-Băldău & Dumitrașcu, 2019). Different technologies can be better for different situations (Bjorvatn & Wald, 2019). Another dimension to the utilization of communication technology is social media. Social media can improve informal communication while also providing solid platforms to support group work (Orta-Castañon, Urbina-Coronado, Ahuett-Garza, Hernández-de-Menéndez, & Morales-Menendez, 2018).

2.2.2. Trust

Trust is the state that allows building and maintaining relationships between people and consequently, enables access to easily-built social capital. (Natu & Aparicio, 2022). Trust had already been accepted as a crucial aspect of virtual teams with positive impacts on performance and job satisfaction (Shaik & Makhecha, 2019). Trust is one of the most important factors that affect team performance (Vida, Majzoub, & Meidute-Kavaliauskien, 2020). Trust is vital as it helps to reduce the psychological distance between team members (Flavian, Guinaiu, & Jordan, 2018). Trust is the key variable that is crucial to for all aspects of collaboration (Choi & Cho, 2019)

Within virtual teams, trust is fragile (Vida, Majzoub, & Meidute-Kavaliauskien, 2020). According to the social exchange theory, once swift trust is established, trust depends on the knowledge gained from team members as well as on the positive and negative events that have occurred or may occur (Jaakson, Reino, & McClenaghan, 2018)

Trust improves coordination and performance (Lukic & Vracar, 2018). Hence, virtual leaders need to continuously make efforts to create, reinforce, and maintain trust between the members of their teams as well as between themselves and their team members (Lukic & Vracar, 2018)

Building trust is still a challenge either because of diversity or lack of face-to-face interaction (Zakaria & Yusof, 2020). Trust depends on reputation, demonstrated work attitude, and clear and objective goal determination and that It develops easier in longer relationships (Cheng, Fu, & de Vreede, 2021). However, employing a system to keep the whole team updated on everyone's activities and their role in completing the project can enhance trust among team members (Al Zain, Vasilache, & Incze, 2018). Feedback is also crucial in creating trust. Feedback has also proven to be a valued asset in creating trust, as long as the feedback is positive (Jaakson, Reino, & McClenaghan, 2018).

2.2.3. Geographical Distribution of Team Members

Geographical distribution of teams is one way to define virtual teams. A team geographically dispersed and working interdependently using technology to communicate and collaborate across time and space (Kyu & Cho, 2018). Virtual team members are geographically dispersed and accomplish their goals using technology-based tools (Natu & Aparicio, 2022). Virtual teams are also defined by the use of information and communications technologies and by their dispersed geographic location (Toro, Elguezabal, & Anacabe, 2020).

One of the most competitive advantages virtual teams enjoy is geographical team dispersion whose members come from different backgrounds and cultures and hold different points of view (Vida, Majzoub, & Meidute-Kavaliauskien, 2020).

However, due to the dispersed nature of virtual teams, these teams still present some vulnerabilities which are important to acknowledge and resolve so that organizations can help these teams to achieve their full potential and value (Pereira, et al., 2024). Also, temporal distance can lead to incompatible schedules that result in project delays and can only be overcome with careful planning (See, 2018)

2.3. Conceptualising Project Management Processes

Project management is to a high extent recognized as a solution enabling gaining higher effectiveness by the implementing companies (Moczydłowska & Sadkowska, 2021). While leadership and knowledge are becoming less frequent topics of research, project management and engagement are becoming more popular (Pereira, et al., 2024).

Project management is a domain in which success is heavily linked to the systematic identification and application of best practices (Daemi, Chugh, & Kanagarajoo, 2020). Projects developed by virtual teams need special attention in terms of planning, ensuring adequate risk management, and proper scope and requirements definition (Gallego, Ortiz-Marcos, & Romero Ruiz, 2020). Pereira, et al., (2024) mentioned that proper definition of requirements and scope were considered the areas where the use of virtual teams has bigger influence on project planning, and there is still room for improvement in order to reach full potential.

Technology has indeed affected the project management process. Daemi, Chugh, and Kanagarajoo (2020) mentioned that the application of social media in managing projects has raised concerns about the rigor of the methods used for the integration of social media in project management. Hence, a holistic social media adoption strategy is needed to ensure the effective usage of social media in project management. Project managers could benefit from social media use in addressing the challenges of current practices. Documentation of design projects and traceability of decisions and revisions is of high importance and is an example where social media use can be beneficial to project management (Kinneging, de Graaf, Siebelink, & van Dijck, 2020).

The time-span of a project influences the coordination needed. Shorter projects should be led with tighter coordination even though this does not foster collaboration behaviours, whereas longer projects can be controlled loosely promoting a more effective collaboration (Chamakiotis, Boukis, Panteli, & Papadopoulos, 2020)

2.4. Benefits of Virtual Teams in Project Management

Members of a virtual team are geographically dispersed and accomplish their goals using technology-based tools. Regardless, virtual teams do not have to totally rely on technological tools to communicate and accomplish goals. They may meet face-to-face whenever necessary. Considering this, the degree of the virtuality of each team varies (i.e., comparing a team that meets face-to-face monthly and another that never meets face-to-face, the second one has a higher degree of virtuality) (Natu & Aparicio, 2022). Although virtual teams have been a subject of research for more than 30 years, it is still very much a current topic (Toro, Elguezabal, & Anacabe, 2020). In the last decade, organizations have started to adopt virtual teams to complete projects to exploit knowledge without having to relocate employees. (Gibbs, Sivunen, & Nordback, 2021). These teams have been considered as a powerful structure in the current context, delivering projects with different focus from strategic to operational (Duque, et al., 2020).

Virtual teams are an important component of agile systems by contributing team members to work more efficiently, to collaborate, and to share skills (Sampaio, Bastos, & Marinho, Soft skills for newborn software engineers in agile teams, 2021). Individuals may be concerned about the risk of infection from highly contagious diseases in crowded spaces, which are common in workspaces, even after physical distancing laws are removed and hybrid or completely physical labour is permitted (Wendt, Adam, Benlian, & Kraus, 2021). Virtual teams remain the primary source of intangible asset acquisition in organizations (Christensen & Pedersen, 2018).

2.5. Theoretical Framework

2.5.1. Social Presence Theory

The social presence theory was developed to help understand interpersonal communication and relationship building in a business setting when using telecommunication media and how this has an impact on the social influence communication partners may exert on each other. Short et al. (1976) defined social presence as the “degree of salience of the other person in the interaction and the consequent salience of the interpersonal relationships” (p. 65). The level of social presence differs across various communication platforms, impacting the dynamics of interaction. Furthermore, it intertwines with the intended purpose of communication, shaping the individual's choice of medium for engaging with others (Short et al., 1976). This theory looks at the quality of communication mediums and how they influence interpersonal interactions. Short et al. (1976) posit that different telecommunication media possess varying levels of social presence, which significantly impacts individuals' interaction styles. Essentially, the more sociable, sensitive, warm, and personal a medium appears, the greater the perceived social presence it engenders.

Gunawardena (1995) refined the definition of social presence as "the degree to which a person is perceived as a 'real person' in mediated communication" (p. 151). She stressed that social presence can be nurtured among participants engaging in teleconferences and computer-mediated communication. Understanding this is vital in crafting efficient communication systems.

Technology aids in fostering a sense of social presence but is not the solution (Jian & Amschlinger, 2006). They identified three processes that are critical in constructing and maintaining the sense of social presence: identification, structural interdependence, and leadership. Team identification is a dual process involving psychology and communication, fostering a sense of unity. Structural interdependence is crucial at both organizational and team levels, and it is achieved through effective goal-setting and task interdependence. Leadership plays a pivotal role in facilitating structural and psychological connectedness through actions like role specification and motivation. Considering the cultural diversity among virtual team members, attention to social contexts, rather than just technological bandwidth, is key to enhancing social presence (Jian & Amschlinger, 2006). A recent study by Oh et al. (2018) also supports the fact that social presence plays a critical role within networked environments such as virtual teams.

2.5.2. Transaction Cost Theory

Transaction cost theory studies transactions as the most basic unit of measure and focuses on how much effort, resources, or cost is necessary for two parties to complete an exchange (Williamson, 1981). This theory regards transaction as the basic unit of analysis and posits that the knowledge of economizing transaction cost is central to the study of organizations.

This theory examines the frequency of transactions involving an organization's resources, their suitability for the organization, the level of uncertainty involved, and the extent to which a resource is specific; these factors contribute to the escalation of transaction costs. Organizations employ various strategies such as utilizing non-specific assets, vertical integration, long-term contracts, partial ownership agreements, and investments at equitable levels to reduce transaction costs (Celtekligil, 2020). The simple argument of this theory is that firms economize on costs by choosing a form of governance that minimizes production and transaction costs (Mooi, 2015).

A critic of this theory, Ghosal and Moran (1996) argues that the recommendations of this theory are not only erroneous but also pose risks for corporate managers due to the underlying assumptions and reasoning upon which they are based. Organizations are not mere substitutes for structuring efficient transactions when markets fail; they possess unique advantages for governing certain kinds of economic activities through a logic that is very different from that of a market (Ghosal & Moran, 1996).

Looking at virtual teams through the lens of this theory, it is a viable option for firms to reduce their transaction costs. Firms expand the use of digital technologies to reduce their transaction costs (Vlasov & Okhlopkov, 2022). Digital technologies and virtual teams have an impact on transaction costs. The economics of digital production suggest a shift towards greater prominence of nonmarket production models in the overall information production system. This transition is expected to enhance efficiency, resulting in increased information production, much of which will be accessible to users at marginal cost (Benkler, 2006).

3. Methodology

3.1. Research Method

This study adopts the quantitative research method. The justification for the adoption of this research method is due to the positivist research philosophy this study is premised upon. In other words, this study aims to examine the phenomenon of interest in an objective way, free from the subjective bias of the researchers.

3.2. Research Design

The study used the explanatory cross-sectional research design. The rationale behind the use of the explanatory research design is because the study sought to investigate the causal relationships between variables (Agbakwuru, 2023). Also, the reason for the study being a cross-sectional one is due to the fact the researchers aim to examine the phenomenon of interest at a particular point in time.

3.3. Population and Sampling

The target population of this study are employees of fintech firms in Nigeria who have belonged to a virtual team at one point in time. Purposive sampling technique was used to select participants who have direct experience with virtual teams and project management in the Nigerian fintech sector. Due to the fact that the population figure is unknown, the Cochran's (1963) formula was used. Hence, it is given as follows:

$$n = \frac{Z^2 pq}{e^2}$$

Where:

$$e = 0.05$$

$$p = 0.5$$

$$q = 0.5$$

$$Z = 1.96$$

$$n = \frac{(1.96)^2 \times 0.5 \times 0.5}{(0.05)^2}$$

$$n = 385$$

Therefore, the sample for this study entailed 385 employees of fintech firms in Nigeria who have belonged to a virtual team at one point in time.

3.4. Research Instrument

The research instrument used in this study is a close-ended structured electronic questionnaire split into five sections – Sections A – E. Section A deals with information regarding the demographic profile of respondents; section B deals with the first proxy of Virtual Teams – Communication Technology Utilisation; section C deals with the second proxy of Virtual Teams – Trust; section D deals with the third proxy of Virtual Teams – Geographical Distribution of Teams; section E is concerned with information regarding Project Management Processes. The questionnaire was pre-tested for reliability using the Cronbach's alpha coefficient, $\alpha \geq 0.6$ (Hajjar, 2018).

3.5. Analytical Technique

Collected data was analysed using multiple regression analysis via the aid of STATA 17. This is because the study sought to examine the causal relationships between more than one independent variable (Communication Technology Utilisation, Trust, and Geographical Dispersion of Teams) on a dependent variable (Project Management Processes). To determine the type of multiple regression used, the data was subjected to normality and multicollinearity tests. Since the data was seen to pass the normality and multicollinearity tests as shown in the results section, multiple linear regression was used.

The regression model for this study is given as follows:

$$y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \mathcal{E} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (i)$$

$$PMP = \beta_0 + \beta_1 CTU + \beta_2 Tr + \beta_3 GDT + \mathcal{E} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (ii)$$

Where:

PMP = Project Management Processes
CTU = Communication Technology Utilisation
Tr = Trust
GDT = Geographical Distribution of Teams

4. Results

4.1. Socio-demographic Characteristics of Respondents

Table 1 Socio-demographic Characteristics of Respondents

Variables	Frequencies	Percentages
Gender		
Male	221	58.47
Female	157	41.53
Age		
18-23 years	22	5.82
24-29 years	111	29.37
30-35 years	177	46.83
Above 35 years	68	17.99
Role in the Organisation		
Project Manager	66	17.46
Team Member	222	58.73
Executive	23	6.08
Prefer not to say	67	17.2
Size of Virtual Team		
2-5 members	46	12.17
6-10 members	177	46.83
11-20 members	67	17.72
More than 20 members	88	23.28
Length of Employment		
Less than 1 year	68	17.99
1-3 years	243	64.29
3-5 years	45	11.90
More than 5 years	22	5.82
Total	378	100.0

Source: Field Survey (2024)

The demographic profile of the respondents in this study reveals a diverse representation across various categories, highlighting the characteristics of individuals working in virtual teams within the Nigerian fintech sector.

Regarding gender distribution, a majority of the respondents were male, accounting for 58.47% (221 individuals), while females constituted 41.53% (157 individuals). This indicates a higher participation of males in the virtual teams surveyed.

The age distribution of the respondents shows that the largest age group was those between 30-35 years, comprising 46.83% (177 individuals) of the sample. This is followed by respondents aged 24-29 years, who made up 29.37% (111

individuals). A smaller portion of the sample, 17.99% (68 individuals), were above 35 years old, while the youngest group, aged 18-23 years, represented only 5.82% (22 individuals) of the respondents.

When examining the roles within the organization, a significant majority of the respondents were team members, making up 58.73% (222 individuals) of the sample. Project managers accounted for 17.46% (66 individuals), while executives represented 6.08% (23 individuals). Additionally, 17.2% (67 individuals) preferred not to disclose their role within the organization.

The size of the virtual teams varied, with the largest proportion of respondents, 46.83% (177 individuals), working in teams of 6-10 members. Teams with more than 20 members comprised 23.28% (88 individuals) of the sample, while 17.72% (67 individuals) worked in teams of 11-20 members. The smallest group, 12.17% (46 individuals), reported working in virtual teams of 2-5 members.

Lastly, the length of employment among the respondents shows that a majority, 64.29% (243 individuals), had been employed for 1-3 years. Those with less than 1 year of employment accounted for 17.99% (68 individuals), while 11.90% (45 individuals) had been employed for 3-5 years. A smaller portion, 5.82% (22 individuals), had more than 5 years of employment experience.

4.2. Reliability Test

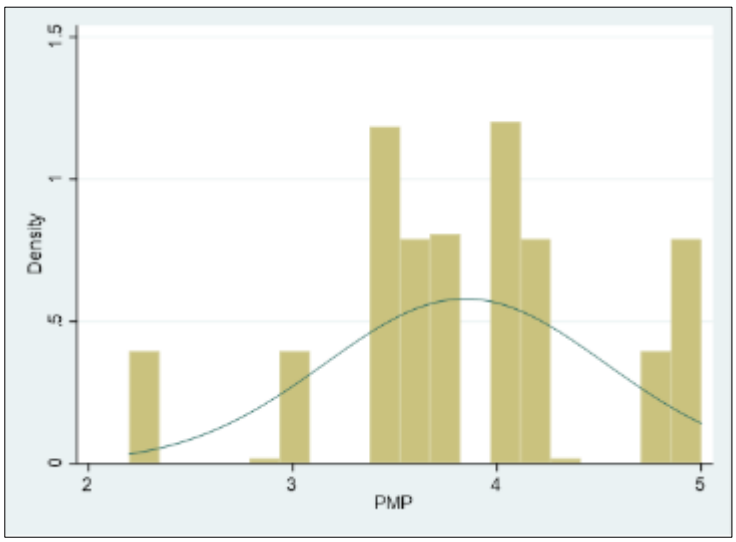
Table 2 Reliability Test

S/N	Scales	Cronbach's alpha	No. of Items
1	CTU	0.8018	4
2	Tr	0.7562	4
3	GDT	0.6094	4
4	PMP	0.8701	5

Source: Researchers' Computation (2024)

Using the assertion of Hajjar (2018) where $\alpha \geq 0.6$, it is obvious that all the scales of the study's research instrument passed the reliability test.

4.3. Normality Test



Source: Researchers' Computation (2024)

Figure 1 Normality Plot Graph

Based on the fact that the graph above follows a bell-shape, although slightly left skewed, it is said that the data passes the normality test, and hence, a parametric test is suitable for the study.

Table 3 Skewness and Kurtosis Tests for Normality

Variable	Obs	Pr (Skewness)	Pr (Kurtosis)	Joint-test	
				Adj chi2(2)	Prob>chi2
PMP	378	0.0506	0.2695	5.05	0.0800

Source: Researchers' Computation (2024)

Using the Skewness and Kurtosis tests (sktest) for normality, given the fact that the p-value of 0.0800 is greater than the significance value of 0.05, it can be said that the data follows a normality distribution. In other words, the data passed the normality test. This also justifies the use of a parametric test.

4.4. Multicollinearity Test

Table 4 Multicollinearity Test

Variable	VIF	1/VIF
GDT	1.92	0.520603
CTU	1.52	0.660022
Tr	1.36	0.737922
Mean VIF	1.60	

Source: Researchers' Computation (2024)

As seen in Table 4.4, the data is void of multicollinearity due to the fact that the VIF for each of the scales is below 10. Hence, it can be said that the study is void of error and the results generated from it can be relied upon.

Based on the data passing the normality and multicollinearity tests, linear regression can be used.

4.5. Regression Analysis

4.5.1. Simple Linear Regression Analysis

```
      Source |       SS           df       MS      Number of obs   =       378
-------------+----------------------------------   F(1, 376)       =    577.25
       Model |  108.006799         1  108.006799   Prob > F        =    0.0000
    Residual |  70.3522443       376  .187107033   R-squared       =    0.6056
-------------+----------------------------------   Adj R-squared   =    0.6045
       Total |  178.359043       377   .47310091   Root MSE        =    .43256

------------------------------------------------------------------------------
         PMP | Coefficient  Std. err.      t    P>|t|     [95% conf. interval]
-------------+----------------------------------------------------------------
Virtualteams |    1.038859   .043239    24.03   0.000     .9538379    1.123879
       _cons |   -.1969511   .1697401   -1.16   0.247    -.5307099    .1368078
------------------------------------------------------------------------------
```

Source: Researchers' Computation (2024)

Figure 2 Simple Linear Regression

The regression analysis in Figure 4.5 explores the impact of virtual teams on project management processes (PMP) within the Nigerian fintech sector. The model, based on 378 observations, is statistically significant, with an F-statistic of 577.25 and a p-value of 0.0000, indicating that virtual teams play a significant role in explaining the variability in PMP. The model's R-squared value of 0.6056 suggests that approximately 60.56% of the variation in PMP can be attributed to the use of virtual teams, while the adjusted R-squared of 0.6045 confirms the robustness of this relationship. The Root Mean Squared Error (Root MSE) of 0.43256 provides a measure of the average deviation of the observed PMP scores from the predicted values.

The coefficient for virtual teams is 1.038859, with a highly significant p-value of 0.000, indicating a positive and strong relationship between the use of virtual teams and PMP. This coefficient suggests that for each unit increase in the use of virtual teams, the PMP score increases by approximately 1.04 units, highlighting the substantial impact of virtual teams on project management effectiveness. The 95% confidence interval for this estimate, ranging from 0.9538379 to 1.123879, further supports the precision of the result.

The constant term, however, is not statistically significant, with a coefficient of -0.1969511 and a p-value of 0.247. This suggests that in the absence of virtual teams, the expected baseline level of PMP does not significantly differ from zero.

In summary, the analysis provides strong evidence that virtual teams significantly enhance project management processes in the Nigerian fintech sector, making them a critical component for achieving better project outcomes. This therefore shows the rejection of the null hypothesis.

4.5.2. Multiple Linear Regression Analysis

Source	SS	df	MS	Number of obs	=	378
				F(3, 374)	=	307.82
Model	126.946239	3	42.315413	Prob > F	=	0.0000
Residual	51.4128041	374	.137467391	R-squared	=	0.7117
				Adj R-squared	=	0.7094
Total	178.359043	377	.47310091	Root MSE	=	.37077

PMP	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
CTU	.3114694	.0316436	9.84	0.000	.2492478	.373691
Tr	-.0085031	.0331544	-0.26	0.798	-.0736956	.0566894
GDT	.7622249	.0483317	15.77	0.000	.6671889	.8572609
_cons	-.3040479	.1470059	-2.07	0.039	-.5931096	-.0149863

Source: Researchers' Computation (2024)

Figure 3 Multiple Linear Regression

The regression analysis provides insights into the effects of three predictors—Communication and Technology Usage (CTU), Trust (Tr), and Group Dynamics and Teamwork (GDT)—on Project Management Processes (PMP) among 378 observations. The model is statistically significant, with an F-statistic of 307.82 and a p-value of 0.0000, indicating that the combined predictors significantly explain variations in PMP.

The R-squared value of 0.7117 reveals that approximately 71.17% of the variability in PMP is accounted for by the model, demonstrating a strong explanatory power. The adjusted R-squared of 0.7094 adjusts for the number of predictors in the model, confirming that the model fits the data well. The Root Mean Squared Error (Root MSE) of 0.37077 provides an estimate of the average distance between the observed and predicted PMP values.

Examining the coefficients, Communication and Technology Usage (CTU) has a positive coefficient of 0.3114694, with a standard error of 0.0316436, a t-value of 9.84, and a p-value of 0.000. This significant coefficient indicates that increases in CTU are associated with higher PMP scores, with the 95% confidence interval ranging from 0.2492478 to 0.373691, suggesting a substantial and reliable positive effect.

In contrast, the Trust (Tr) variable has a coefficient of -0.0085031, with a standard error of 0.0331544, a t-value of -0.26, and a p-value of 0.798. This indicates that Trust does not have a statistically significant impact on PMP, as the confidence interval includes zero (ranging from -0.0736956 to 0.0566894).

Geographical Dispersion of Teams (GDT) shows a strong positive effect with a coefficient of 0.7622249, a standard error of 0.0483317, a t-value of 15.77, and a p-value of 0.000. The 95% confidence interval for GDT, spanning from 0.6671889 to 0.8572609, underscores its significant and positive relationship with PMP.

The constant term, with a coefficient of -0.3040479 and a p-value of 0.039, is statistically significant. This suggests that when all predictors are zero, the baseline level of PMP is significantly different from zero, as indicated by the confidence interval ranging from -0.5931096 to -0.0149863.

In summary, the analysis shows that CTU and GDT are significant predictors of PMP, with CTU having a moderate positive effect and GDT having a strong positive impact. However, Trust does not significantly influence PMP, suggesting that other factors may be more relevant in this context.

Table 5 Tabular Summary of Hypotheses

Hypotheses	Predictor Variables	Coefficients	P-Value	Type of Relationship	Remarks
H_{01}	VT	1.038859	0.000	Positive	Significant
H_{02}	CTU	0.3114694	0.000	Positive	Significant
H_{03}	Tr	-0.0085031	0.798	Negative	Insignificant
H_{04}	GDT	0.7622249	0.000	Positive	Significant

Source: Researchers' Computation (2024)

5. Discussion of Findings

This study examined the influence of virtual teams on various aspects of project management processes. The key findings indicated that there is a positive and strong relationship between the use of virtual teams and project management processes. Specifically, communication and technology usage, and the geographical dispersion of teams positively impact the success of project management processes, while in contrast, trust as a key variable does not significantly influence project management processes.

Contrary to the initial hypothesis that virtual teams negatively affect project management processes in the Nigerian fintech sector, the results of this study indicate that there is a positive and strong relationship between these two variables. The hypothesis was based on the premise that the social presence theory, characterized by interpersonal relationship and relationship building, influences project management processes and success. Several factors might explain why the results did not align with our hypothesis. For instance, the contexts and culture in which the participants worked virtually might vary (Morrison-Smith & Ruiz, 2020). Moreover, the adaptability skills of the participants might have made a significant difference (Asatiani et al., 2021).

In addition, the findings do not align with the second and fourth hypotheses, which posited that communication technology utilization, and the geographical distribution of team members would not significantly affect project management processes in the Nigerian fintech sector. The results support Oh et al.'s (2018) assertion regarding the interplay between technology utilization and geographical presence, and their significant influence on organizational success.

In contrast, the results align with the third hypothesis, which suggested that trust does not have a significant effect on project management processes in the Nigerian fintech sector. This finding corroborates transaction cost theory, which emphasizes the importance of effort, resources, and cost in the exchange between employees and employers (Frenken & Schor, 2019; Plekhanov et al., 2022). According to this theory, trust is considered a secondary factor in the project management process, with productivity and efficiency being more critical. Although the results did not support all the hypotheses, they contribute to a more nuanced understanding of virtual work and highlight the need for context-based approaches in future research on this topic.

6. Conclusion and Recommendations

This study accentuates the positive impact of virtual teams on project management processes and examined the influences of variables such as communication technology utilizations, geographical distribution of team members, and trust building. As posited by Shah-Nelson et al. (2020), these factors are essential in determining the success, mode of operations and engagements of virtual teams in managing and implementing projects. Moreover, the study contributes to the broader understanding of workplace dynamics and productivity by underscoring the importance of effective resource allocation, virtual-workplace culture, and strategic geographic location in determining the processes of project management teams (Newman & Ford, 2021; Stocker et al., 2018).

Specifically, this research provides practitioners with approaches for maximizing virtual work settings for project management effectiveness. It emphasizes that organisations in the Nigerian fintech sector should not neglect remote work as virtual teams are seen to play a pivotal role in having better project management processes. Hence, policies

regarding the proper administration and management of virtual teams should be formulated so as to maximise the benefits associated with virtual teams in project management processes.

Although this study seems to have provided important information to the body of knowledge, it is limited by its focus on the Nigerian fintech industry, which may constrain the applicability of the result to other industries. Therefore, it is recommended that future research examine a comparison between the influence of virtual team across various industries and organisational contexts. While research on virtual work has received attention from many scholars, particularly since the advent of the covid-19 pandemic, there are limited studies comparing various contexts (Karl et al., 2022; Newman & Ford, 2021; Wang et al., 2021).

Furthermore, it is suggested that other pragmatic approaches be explored in understanding the perception of employees working in the virtual context, while simultaneously applying various moderating variables. According to Allemang et al. (2022), these approaches could include a combination of qualitative and quantitative methodologies for better understanding of a phenomenon. In addition, Kelly and Cordeiro (2020) posit that researchers can achieve actionable knowledge and experiential process through pragmatic research.

Lastly, it is recommended that more research focusing on the various roles and expectations of virtual workers and their employers should be carried out. Prior research highlights the role-based interaction between workers and their employers and its effect on workplace performance (Kim & Qu, 2020; Riyanto et al., 2021). Therefore, it has become imperative for researchers to inquire into how practical this will be in a virtual work setting and what leadership and managerial approaches will be effective for achieving project outcomes across small- and large-scale organisations.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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