Impact of Agile Methodology on Project Team Dynamics in MTN Nigeria

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Abstract
This study is on the impact of agile methodology on project team dynamics in MTN, a mobile telecommunication firm in Nigeria. The study adopted the survey research design methodology and was circumspective in the process. Primary method of data collection, specifically the use of questionnaire was employed in the collection of data used in the study. The Partial Least Square Structural Equation Model (PLS-SEM) was used inanalysing the data extracted from 155 respondents that also formed the population of the study. The findings and conclusion in this study include, that agile methodology has significant effect on project team dynamics viz: - team collaboration, team communication, and team motivation. The study supports and recommends that project managers and by extension, organizations should focus and direct attention toward project team dynamics by promoting the spirit of cooperation and open communication among project teams members. This is achievable by supporting regular team meetings, giving team members the chance to offer comments, suggestions, and opinions, as well asparticularly encouraging openness among team members and in project managementin general. Deliberate attempt and effort in building respect and trust amongst team members should be given priority as respect and trust among team members are crucial and vital components in effective communication and collaboration. Project managers are admonishedto place priority on team involvement, communication, collaboration,and motivation.

Keywords: Agile Methodology, project team dynamics, team collaboration, team communication, and team Motivation

1. Introduction

A set of guidelines and practices known as agile methodology are becoming very popular in project management. Instead of the conventional traditional or linear approach to project management, these techniques which place emphasis on flexibility, adaptability, and iterative development are gradually taking over the terrain of project management. Agile methodology, also known as, agile approaches are created to enhance teamwork, motivation, and communication—all of which are essential for a project's success. Due to their focus on adaptability, flexibility, and iterative development, agile approaches have become extremely popular in the project management community. These approaches have metamorphosed into a crucial tool for project managers who want to enhance team chemistry and complete successful projects.

These approaches use one- to four-week-long sprints, which are brief development cycles. A specified set of features or needs is planned, designed, developed, tested, and reviewed during each sprint. In project management, collaboration among the team and the team members is essential and vital to the success of the project. Agile techniques prioritize collaboration, teamwork, and communication among team members (Ilyés, 2019). The purpose of daily stand-up meetings is to provide team members a chance to update one another on their progress and any problems they may be having. Regular team retrospectives are also crucial because they give the team the chance to evaluate their performance and find new ways to collaborate more successfully (Noguera, Guerrero-Roldán, &Masó, 2018).Another crucial element of agile techniques is ongoing feedback. Throughout the development process, feedback is given, enabling team members to change and improve in response to client feedback and shifting requirements. Another important benefit of agile approaches is enhanced communication. Open communication among team members, stakeholders, and clients is emphasized by agile approaches (Hidalgo, 2019).

Daily update is important in project management and among project team members. Team members can update themselves on project progress and other issuesaffecting them at daily stand-up meetings. Team members are availed the opportunity to evaluate their performance and pinpoint areas for improvement during routine team retrospectives. Agile methodology or technique places strong emphasis on verbal rather than written communication. This enables team members to establish bonds and create a shared comprehension of the project. Team members are informed and put on the same page, using visual communication tools like sticky notes and whiteboards(Tam da Costa Moura, Oliveira, &Varajo, 2020).

Although agile techniques are increasingly being used in project management, little study has looked at how these methodologies affect project team dynamics. By analyzing how agile approaches affect team collaboration, communication, and motivation, this study seeks to close this research gap. The results will help project managers understand how agile techniques can enhance project team dynamics and will give them advice on how to successfully use agile methodologies to their projects (Tyagi, Sibal, & Suri, 2022).Because of its adaptability, flexibility, and emphasis on ongoing improvement, agile approaches have become increasingly popular in recent years. Agile approaches are intended to improve the dynamics of project teams, including cooperation, motivation, and communication. According to Stray, Moe, and Hoda (2018), little study has been done in this area, and it is unclear how agile techniques will affect these team dynamics.

The objective of this study is to examine the effect of agile methodologies on project team dynamism in MTN Ltd. Other objectives are to examine the effect of agile methodologies on team collaboration, to determine the effect of agile methodologies on communication in MTN Ltd and to evaluate the effect of agile methodologies on motivation in MTN Ltd.

2.0 Literature Review

2.1 Conceptual Framework

Agile approaches are becoming more popular in project management due to their responsiveness to shifting needs (Noguera, Guerrero-Roldán, &Masó, 2018). The Agile Manifesto highlights the value of successful team cooperation, communication, and motivation in attaining project success, emphasizing the importance of persons and interactions over processes and tools. Agile approaches place a strong emphasis on segmenting work into smaller, more manageable pieces and promoting ongoing feedback and adaption. This strategy promotes a climate of cooperation and open communication, which may increase team members' motivation and involvement. Agile approaches may have a good effect on project team dynamics, according to research. Agile project management approaches were found to foster cooperation and communication among distant project teams, according to a study by Tyagi, Sibal, and Suri (2022). The study stressed the value of respect, trust, and openness in fostering productive teamwork within agile environments.

Agile techniques, according to Ahmad, Ahsan, and Afzal's (2020), increase team involvement and motivation, which boosted project results. These results are consistent with the idea that agile approaches can significantly improve teamwork, communication, and motivation in project teams. An alternative to conventional project management techniques are agile methodologies. Traditional approaches frequently rely on a linear process that includes project planning, execution, and closure (Ilyés, 2019). On the other hand, agile approaches are founded on an iterative procedure that includes ongoing development and testing. The Agile Manifesto, written by a group of software professionals in 2001, lays out the fundamental ideas behind agile approaches. The manifesto places a strong emphasis on people and relationships, functional software, client participation, and adapting to change.

Teams can respond to shifting requirements and feedback because to agile approaches' flexibility and adaptability (Ilyés, 2019). Agile approaches often entail brief development cycles that run one to four weeks and are known as sprints. A specified set of features or needs is planned, designed, developed, tested, and reviewed during each sprint. Short sprints allow for continuous testing and development, which helps find problems early on and lowers the possibility of delays and cost overruns.

Team Collaboration

Improved teamwork is one of the main advantages of agile approaches. Agile techniques encourage collaboration, teamwork, and communication among team members (Ilyés, 2019). Numerous procedures, such as daily stand-up meetings, frequent team retrospectives, and ongoing feedback, are used to accomplish this. The purpose of daily stand-up meetings is to provide team members a chance to update one another on their progress and any problems they may be having (Ciric Lalic, Lalic, Delić, Gracanin, &Stefanovic, 2022). These gatherings assist to keep everyone informed of the status of the project and on the same page. Another key agile methodology practice is doing regular team retrospectives. Meetings known as retrospectives are held at the conclusion of each sprint to evaluate the team's performance and pinpoint areas that need improvement (Przybilla, Wiesche, & Krcmar, 2018). This enables the team to evaluate their performance and find new strategies to cooperate more successfully. Agile techniques likewise depend heavily on continuous feedback. Throughout the development process, feedback is given, enabling team members to change and improve in response to client feedback and shifting requirements.

Communication

Another important benefit of agile approaches is enhanced communication. Open communication between team members, stakeholders, and customers is emphasized in agile approaches. (Langholf, & Wilkens, 2021) Numerous procedures, such as daily stand-up meetings, frequent team retrospectives, and ongoing feedback, are used to accomplish this. Team members can update one another on their progress and any problems they are having at daily stand-up meetings (Przybilla, L., Wiesche, & Krcmar, 2018). Team members get the chance to evaluate their performance and pinpoint areas for improvement during

routine team retrospectives. Team members can change and improve as needed in response to client feedback and shifting needs thanks to continuous feedback.
Agile techniques also place a strong emphasis on verbal rather than written communication. This enables team members to establish bonds and create a shared comprehension of the project. To keep the team members informed and on the same page, agile techniques often emphasize the value of visual tools like sticky notes and whiteboards. (Ciric Lalic, Lalic, Delić, Gracanin, & Stefanovic, 2022).

Motivation
Another significant advantage of agile approaches is increased motivation. Agile techniques place a strong emphasis on empowerment, cooperation, and collaboration (Grass, Backmann, &Hoegl, 2020). Team members are better motivated and more engaged when they feel like they have ownership and responsibility. Agile techniques also place a strong emphasis on the value of acknowledging team members' contributions and celebrating achievements. This enhances morale and fosters a productive work atmosphere.Additionally, agile techniques provide team members a sense of direction and purpose. A clear understanding of the team's goals is aided by the quick development cycles and emphasis on client feedback.

2.2 Theoretical Framework
This study reviewed some theories, namely Social Exchange Theory, Self-Determination Theory and Team Development Models.

2.2.1 Social Exchange Theory
This theory propounded by George Homans in 1958, posits that individuals engage in social interactions based on the perceived costs and benefits involvedin such interactions. In the context of agile methodologies, this theory can help explain how team members' collaboration, communication, and motivation are influential and beneficial to the members. Some of benefits include increased autonomy, flexibility, and enhanced team dynamics. It also explains how the level of collaboration, communication, and motivation may vary based on team members' perceptions of the costs associated with adopting agile methodologies, such as increased workload or learning curve.

2.2.2 Self-Determination Theory
Self-Determination Theory (SDT) is a psychological framework that was initially proposed by Edward L. Deci and Richard M. Ryan in the 1980s. It focuses on the innate psychological needs and motivation that drive human behavior and well-being. It emphasizes the importance of three fundamental psychological needs: autonomy, competence, and relatedness. Self-determination theory focuses on intrinsic motivation and the satisfaction of basic psychological needs. It suggests that individuals are motivated when they experience autonomy, competence, and relatedness in their work. In the context of agile methodologies, this theory can help understand how the adoption of agile practices, which emphasize self-organizing teams, empowerment, and continuous learning, can impact team members' intrinsic motivation. It can explore how agile methodologies facilitate autonomy, competence development, and social connections, leading to increased collaboration, communication, and motivation within the team.

2.2.3Team Development Models
Developed by psychologist Bruce Tuckman (1965). Various models, such as Tuckman's stages of group development or the Drexler/Sibbet Team Performance Model, can provide insights into how teams evolve over time and the factors that influence team dynamics. These models can be applied to understand how the implementation of agile methodologies may influence team collaboration, communication, and motivation at different stages of the project. For example, during the forming stage, agile methodologies

might help establish clear communication channels and foster collaboration by emphasizing iterative feedback and open dialogue.
Haven carefully x-rayed the above related theories, the social exchange theory is considered most suitable and appropriate for this study, therefore the study in anchored on the social exchange theory.Studies like Jacob, Ringim and Shuaibu (2022), Anetoh, Nwadialor, Anetoh and Okeke (2021) and Oloye, Ogbebor and Okusami (2020) have extensively demonstrated the applicability of this theory.

2.3 Empirical Review
Noguera et al (2018) explored the impact of agile methodologies on the frequency and quality of meetings, clarity of project updates, and degree of transparency in the project process. The study involved interviews with project managers who have adopted agile methodologies in their teams. The findings suggested that agile methodologies enhance communication among team members, as they allow for regular team meetings and updates, ensuring transparency and clarity in the project process.

Tam et al (2020) revealed that agile methodologies could enhance motivation in project teams by fostering a sense of ownership and empowerment. The researchers surveyed 200 project team members and found that those who worked under agile methodologies exhibited higher levels of job satisfaction, engagement, and productivity. The study concluded that the implementation of agile methodologies could significantly improve the motivation of team members, contributing to better project outcomes.

Tyagi et al (2022), the researchers conducted a case study on a software development company that adopted agile methodologies. The study found that agile methodologies improved collaboration, communication, and motivation among project team members. The researchers noted that agile methodologies encouraged frequent communication and collaboration, fostered a sense of ownership among team members, and enabled rapid responses to changes, thereby improving the efficiency and productivity of the project teams.

Stray et al (2018) conducted a systematic literature review on the impact of agile methodologies on project team dynamics. Their review included 30 empirical studies, and they found that most of the studies reported positive impacts of agile methodologies on collaboration, communication, and motivation. However, the review also noted that there were few empirical studies focusing specifically on these impacts, indicating a need for further research in this area.

Ilyés (2019) found that agile methodologies enhanced the collaboration and communication among team members, thereby improving the overall project outcomes. The study involved a survey of 150 project teams in the software development industry that adopted agile methodologies. The results showed a significant improvement in team collaboration as measured by the number of joint tasks completed, resource sharing, and the quality of the product.

3. Methodology
The study used survey research design. According to Amin and Hossain (2019) survey method allows for collection of large amounts of data, flexibility, and quantitative analysis. Therefore, survey research design provided the possibility to explain causal relationships between the study concept and variables of the study. The population of this study consists of 155 officers in MTN Nigeria in 2023 which included 5 managers, 20 project supervisors, 30 M&E officers, 60 project officers, 25 finance officers and 10 project managers as presented below:

Table 1: Population of the study

Respondents	Population
Managers	10
Project supervisors	20
M and E officers	30
Project officers	60
Project managers	10
Finance officers	25
Total	**155**

Source: Pilot Study, 2023

In this study census was used since the population is less than 200. Census is effective when the sample size is less than 200 (Mugenda & Mugenda, 2021). The sample size for this study was therefore 155. The study shall adopt convenience sampling technique and the reason is that convenience sampling is a non-probability sampling method where units are selected for inclusion in the sample because they are the easiest for the researcher to access. This can be due to geographical proximity, availability at a given time, or willingness to participate in the research.

The study employed the primary data source, and the data is collected using a structured questionnaire accompanied with a cover letter and the approach to data analysis is quantitative. The questionnaire is close-ended designed using an ordinal measurement scale via-a-via the 5-point Likert scale ranging from 1(strongly disagree) to 5(strongly agree). The researcher engaged the services of research assistant that assisted in the administration of the questions to the selected respondents. The research assistants are educated on how to administer the questionnaire. The research assistants returned the copies of questionnaire after two weeks.

The internal consistency or reliability of the instrument for this research is determined by means of Cronbach's Alpha, using the Partial Least Square Structural Equation Model (PLS-SEM). Any instrument with a coefficient of 0.70 and above is seen as valid and reliable. The Partial Least Square Structural Equation Model (PLS-SEM) is used to model the regression analysis that is used to test the hypotheses to determine if there is an effect of independent variables on dependent variable. The PLS path modelling method was developed by Wold (1982). The PLS algorithm is a sequence of regressions in terms of weight vectors. The weight vectors that will be obtained at convergence satisfy fixed point equations. PLS-SEM is a non-parametric method that does not require that the data meet certain distributional assumptions. However, the parametric significant tests (e.g. as used in regression analyses) cannot be applied to test whether coefficients such as outer weights, outer loadings and path coefficients are significant. Instead, PLS-SEM relies on a non-parametric boot stap procedure (Davison & Hinkley, 1997; Efron &Tibshirani, 1986) to test the significance of various results such path coefficients, Cronbach's alpha, HTMT, and R^2 values and Q^2. The Structural Equation Model that adopted for this study is as follows:

Data Analysis

PLS algorithm model of agile and project team dynamics with the loading values of each item of measurement of the constructs as seen in table 2. Figure 2 describes the PLS Bootstrapping Model with β and P-coefficient of the value of agile methodology and project team dynamics, team collaboration, communication, and motivation. At a p-value of 0.05, all the values of agile methodology, project team dynamics, team collaboration, communication and motivation measurements obtained in the research instrument are significant.

Table 2: Construct validity and Reliability

	Loading	VIF	P Value	AVE	Composite Reliability	Cronbach's Alpha
Constructs	≥ 0.7	<3.0	<.05	≥0.5	≥ 0.8	> 0.7
Agile Methodology (A)				**0.576**	**0.871**	**0.817**
A1	0.771	1.857	0.000			
A2	0.749	1.649	0.000			
A3	0.720	1.869	0.000			
A4	0.776	1.882	0.000			
A5	0.776	1.943	0.000			
Project Team dynamics (PTD)				**0.655**	**0.884**	**0.827**
PTD1	0.786	1.587	0.000			
PDD2	0.781	1.254	0.000			
PDD3	0.823	1.369	0.000			
PDD4	0.847	1.854	0.000			
Team Collaboration (TC)				**0.670**	**0.890**	**0.835**
TC1	0.863	1.773	0.000			
TC2	0.730	2.222	0.000			
TC3	0.828	1.965	0.000			
TC4	0.847	2.113	0.000			
Communication (COM)				**0.616**	**0.865**	**0.799**
COM1	0.776	1.421	0.000			
COM2	0.676	1.900	0.000			
COM3	0.831	2.556	0.000			
COM4	0.860	1.512	0.000			
Motivation (MO)				**0.640**	**0.899**	**0.859**
MO1	0.792	1.700	0.000			
MO2	0.812	1.652	0.000			
MO3	0.814	1.741	0.000			
MO4	0.746	1.520	0.000			
MO5	0.833	1.963	0.000			

The factor loadings of all measurement items for strategy positioning and firm performance are shown in Table 2. (agile methodology, project team dynamics, team collaboration, communication, and motivation). The instrument's validity and reliability were also evaluated using composite reliability, average variance extracted (AVE) computation and Cronbach Alpha. Meanwhile, the recommended factor loading, composite reliability, AVE, and Cronbach Alpha values were met. However, convergent, and discriminate validity were also considered for determining construct validity in the study. Convergent validity is evidence of an association between strategy positioning and firm's performance. Also, to test for common method bias, the variance inflation factor (IVF) was used (CMB). While a VIF value of one indicates that collinearity is completely absent, most researchers recommend a VIF value of ten as the cutoff. Other researchers advocated for a more conservative cutoff of 2.5 to 5 points (James et al., 2017;

Kock, 2015). As shown in Table 4.15, all the VIF values for each item in each variable measurement are well below the conservative threshold of 5.

Table 3 Heterotrait-monotrait discriminant

	A	PTD	TC	COM	MO
A					
PTD	0.774				
TC	0.683	0.781			
COM	0.810	0.758	0.797		
MO	0.784	0.799	0.777	0.703	

The discriminant validity was evaluated using the correlations' heterotrait-monotrait (HTMT) ratio. The upper confidence intervals are all less than one, and all HTMT values were found to be significantly different from one. Furthermore, the analysis results show that all values are less than the critical value of HTMT 0.85. Furthermore, the mean heterotrait-heteromethodcorrelation is lower than the mean monotrait-heteromethod correlation. As a result, discriminant validity is proven. Table 3 displays the heterotrait-monotrait discriminant value.

Table 4 Model Fit

	Estimated
SRMR	0.077
d_ULS	2.753
d_G	0.998
Chi-Square	679.779
NFI	0.916

As displayed in Table 4, All the model fit indices were found to be satisfactory. The standardised residual average between the observed matrix and the hypothesised covariance matrices is represented by SRMR (Chen, 2007). The SRMR is a model fit estimation metric. When the SRMR is less than 0.08, it is considered reliable. This study model's SRMR was also 0.077, indicating a good fit for this research. With a chi-square value of 679.779, the NFI estimate for this study is 0.916, which is higher than the benchmark of 0.90.

Also, to determine the PLS-SEM predictive relevance of the constructs of measurement and the data points of indicators, the Q^2 values were used. The Q^2 values for PTD, TC, COM, and MO are 0.249, 0.351, 0.387 and 0.363, which is larger than zero. This suggests that the PLS path model has predictive relevance for the constructs. In the same vein, the F square was used to determine the effect size. The f-square values for PTD, TC, COM, and MO are 0.905, 1.292, 1.940 and 1.490, as indicated in Table 4.18. This implies that the sample effect is considered large.

Table 5 Coefficient value

	Variables	Path Co-efficient	SE	T-Statistics	P Values	R^2	F^2	Q^2	Decision
H_{o1}	A →PTD	0.689	0.053	13.220	0.000	0.475	0.905	0.249	Significant
H_{o2}	A→TC	0.751	0.042	18.082	0.000	0.564	1.292	0.351	Significant
H_{o3}	A→COM	0.812	0.044	18.664	0.000	0.660	1.940	0.387	Significant
H_{o4}	A→MO	0.774	0.054	14.388	0.000	0.598	1.490	0.363	Significant

The smart partial least squared statistical results on the relationship between agile methodologies and project team dynamics, team collaboration, communication, and motivation, are shown in Table 5. According to the findings, agile methodology significantly impacts project team dynamics, team collaboration, communication, and motivation. The findings revealed that agile methodology has significant impact on project team dynamics at (β= 0.689, R^2=0.475, t-statistics=13.220>1.96, P-value =0.000 <0.05). The Path coefficient of 0.689 implies a considerable degree of relationship between agile methodology and a project team dynamic. The R^2 value of 0.475 indicates that a 47.5% variance in project team dynamics can be explained by agile methodology.

The findings revealed that agile methodology has significant influence on team collaboration at (β= 0.751, R^2=0.564, t-statistics=18.082>1.96, P-value =0.000 <0.05). The Path coefficient of 0.751 implies a strong degree of relationship between agile methodology and team collaboration. The R^2 value of 0.546 indicates that a 54.6% variance in team collaboration can be explained by agile methodology.

The findings revealed that agile methodology has significant influence on communication at (β= 0.812, R^2=0.660, t-statistics=18.664>1.96, P-value =0.000 <0.05). The Path coefficient of 0.812 implies a strong degree of relationship between agile methodology and communication. The R^2 value of 0.660 indicates that a 66.0% variance in communication can be explained by agile methodology.

The findings revealed that agile methodology has significant influence on motivation at (β= 0.774, R^2=0.598, t-statistics=14.388>1.96, P-value =0.000 <0.05). The Path coefficient of 0.774 implies a strong degree of relationship between agile methodology and motivation. The R^2 value of 0.598 indicates that a 59.8% variance in motivation can be explained by agile methodology.

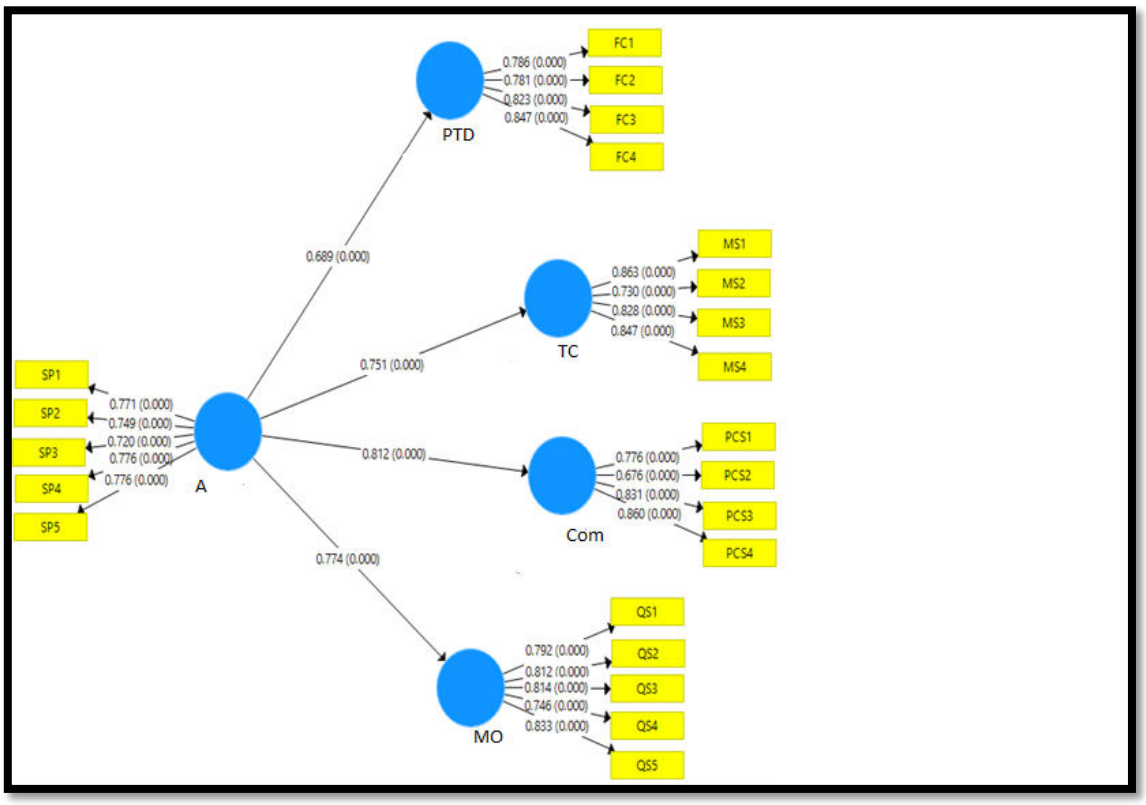

Figure 2: Structural Model

4. Findings

The study found that agile methodology significantly affects project team dynamics, team collaboration, communication, and motivation. Other findings were that agile methodology has significant influence on project team dynamics, agile methodology has significant influence on team collaboration, agile methodology has significant influence on communication and agile methodology has significant influence on motivation. Data from project team members was gathered through empirical research techniques, such as questionnaires and interviews, to acquire insights into their experiences with agile approaches (López-Alcarria, Olivares-Vicente, & Poza-Vilches, 2019). The results of this study provide important light on how agile approaches affect project team dynamics, emphasizing the significance of successful collaboration, communication, and motivation. The study also highlighted several elements that can affect team dynamics, including trust, openness, and leadership, which project managers and organizations can employ to enhance project results. The findings of this study corroborate earlier studies that claim agile approaches can improve project team dynamics. The Agile Manifesto places a strong emphasis on the value of people and relationships over processes and tools, which is consistent with the study's findings. Agile approaches encourage teamwork and open communication, which can increase team members' motivation and engagement levels (Ilyés, 2019). With its unique insights for project managers and companies wanting to improve project results by increasing team dynamics, this study makes a significant contribution to the development of best practices for agile approaches in project management.

5. Conclusion and Recommendation

The study agile methodology significantly affects project team dynamics, team collaboration, communication, and motivation. Other findings were that agile methodology has significant influence on project team dynamics, agile methodology has significant influence on team collaboration, agile methodology has significant influence on communication and agile methodology has significant influence on motivation.

The study recommended that project managers and organizations must put their attention toward promoting a spirit of cooperation and open communication among project teams (Hidalgo, 2019) This can be accomplished by supporting regular team meetings, giving team members the chance to offer comments, and encouraging openness in project management. Respect and trust amongst team members should also be given top priority because they are crucial components of efficient communication and collaboration. Second, project managers must place a high priority on team involvement and motivation (Tam, da Costa Moura, Oliveira, &Varajão, 2020). This can be accomplished through offering chances for professional advancement and development, praising and rewarding team members for their accomplishments, and fostering a climate at work that values cooperation and teamwork. It is crucial for project managers to comprehend how significant team motivation is to a project's success and how it should be given top priority.

Finally, project managers need to make sure that their leadership of the project teams is effective. This entails establishing precise objectives and guidelines, offering help and direction when required, and encouraging a sense of accountability among team members. Positive team dynamics can be fostered through effective leadership, which also makes sure that everyone on the team is working toward the same project objectives.

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