



ASSESSMENT OF EFFECTIVENESS OF AGILE SCRUM PRACTICES IN ENHANCING TEAM COLLABORATION IN PORT HARCOURT CONSTRUCTION PROJECTS

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ABSTRACT: *This study assessed the effectiveness of Agile Scrum practices in enhancing team collaboration in construction projects in Port Harcourt, Nigeria. The research was motivated by persistent challenges in the construction industry such as poor communication, weak coordination, delays, and cost overruns, which are often linked to ineffective team collaboration. A survey research design was adopted, and data were collected from 171 construction professionals drawn from selected construction firms in Port Harcourt using a structured questionnaire. The study examined the extent of adoption of Scrum practices, the factors hindering their implementation, their effectiveness in improving team coordination, and strategies for enhancing their use in construction projects. Data were analyzed using frequency tables and percentages. Findings revealed that Agile Scrum practices such as sprint planning, daily stand-up meetings, sprint reviews, and iterative feedback are moderately adopted in construction projects and significantly improve team communication, coordination, and task alignment. It was concluded that Agile Scrum practices enhance team collaboration when properly implemented within a supportive organizational environment. The study recommends continuous training, provision of technological tools, flexible organizational structures, and strong management commitment to improve Scrum adoption and team collaboration in construction projects in Port Harcourt.*

KEYWORDS: Agile Scrum, Team Collaboration, Construction Projects, Port Harcourt, Project Management.



INTRODUCTION

Agile Scrum is a project management framework that promotes flexibility, teamwork, continuous feedback, and iterative progress in project execution. Scrum practices such as sprint planning, daily stand-up meetings, sprint reviews, and time boxing are designed to improve communication, coordination, and problem-solving among team members (Brown and Smith, 2022; Williams et al., 2023). Team collaboration is essential for successful project delivery, particularly in complex industries such as construction where multiple professionals work together to achieve project goals. Effective collaboration improves communication, task coordination, and overall project performance.

In Port Harcourt, the construction industry is a key driver of economic activity due to its strategic position as an industrial and commercial hub in the Niger Delta region. The city hosts a wide range of construction activities, including residential housing developments, oil and gas infrastructure projects, and commercial buildings. Despite this growth, construction projects in Port Harcourt are frequently affected by coordination challenges, communication inefficiencies, and weak integration among project teams. These issues often result in project delays, cost escalation, and disputes among stakeholders (Uche and Eniola, 2024; Nwachukwu and Okoro, 2025). Construction projects in Port Harcourt continue to experience significant challenges, including delays, cost overruns, and substandard quality outcomes. A major contributing factor to these challenges is inadequate team collaboration. Poor communication, unclear roles, fragmented coordination, and delays in decision-making among architects, engineers, contractors, and clients often lead to misaligned objectives and inefficient project execution (Ugochi, 2024). These issues are compounded by traditional project management approaches, which rely heavily on rigid planning, sequential workflows, and limited adaptability. Such methods are often unable to respond effectively to evolving project requirements, unexpected changes in scope, or the complex needs of diverse stakeholders (Ekundayo & Omoniyi, 2023).

However, there is limited empirical evidence on the implementation and effectiveness of Agile Scrum practices in the Nigerian construction industry, and specifically within Port Harcourt. This knowledge gap presents a critical challenge for construction firms seeking to improve team collaboration, optimize communication, and enhance project outcomes (Musa & Adegboye, 2022).

Without a clear understanding of how Scrum practices influence team performance, firms risk adopting approaches that may not be well-suited to the local construction context, potentially resulting in wasted resources, continued inefficiencies, and reduced project success. Assessing the effectiveness of Agile Scrum in enhancing collaboration among construction teams in Port Harcourt is therefore essential for guiding managerial practices, improving workflow coordination, and achieving higher quality and timely project delivery.

Aim of the Study

The aim of the study is to assess the effectiveness of agile scrum practices in enhancing team collaboration in Port Harcourt construction projects.



Objectives of the Study

The following specific objectives will be actualized in the course of the study:

- i. To identify the Agile Scrum practices currently adopted in construction projects in Port Harcourt
- ii. To identify the factors that hinder the practices of Agile scrum collaboration in construction project in Portharcourt
- iii. To ascertain the effectiveness of Scrum practices in enhancing team Coordination in Port Harcourt construction projects.
- iv. To determine how organizational factors impact the successful adoption of Scrum practices
- v. To recommend strategies for effective implementation of Agile scrum practices to improve team collaboration in PH construction projects

LITERATURE REVIEW

Conceptual Review

Agile Scrum

Agile Scrum is a structured but adaptable project management approach that prioritizes iterative development, ongoing feedback, and strong team collaboration. Originating from the broader Agile philosophy, Scrum offers a practical framework for handling complex projects by breaking work into small, manageable increments and allowing for continuous adjustment of plans. In contrast to traditional project management methods that follow strict, linear stages, Scrum is built to embrace uncertainty and evolving requirements. It achieves this by encouraging regular communication, transparency in processes, and shared accountability among all team members (Schwaber and Sutherland, 2020; Rigby, Sutherland and Takeuchi, 2021).

Dimensions of Agile Scrum

Agile Scrum is not merely a project management framework but a multidimensional system composed of interrelated practices that collectively enhance project delivery and team effectiveness. These dimensions reflect the core operational elements through which Scrum achieves its objectives of adaptability, transparency, collaboration, and continuous improvement. Understanding these dimensions is essential for assessing how Agile Scrum practices influence team dynamics and project outcomes, particularly in complex environments such as construction projects (Schwaber and Sutherland, 2020; Dingsøyr, Nerur and Balijepally, 2022).



Effectiveness of Scrum Practices

The effectiveness of Scrum practices has attracted increasing attention across different industries, driven by the rising need for flexible, collaborative, and results-oriented project management methods. As a structured Agile framework, Scrum is intended to boost productivity, strengthen team interaction, and support the continuous delivery of value through iterative cycles of work. Its success is generally assessed by how well it enhances communication, improves coordination, increases adaptability, and contributes to overall project performance (Schwaber and Sutherland, 2020; Rigby, Sutherland and Takeuchi, 2021).

Theoretical Framework

Socio-Technical Systems (STS) Theory

The Socio-Technical Systems (STS) Theory was propounded by Eric Trist and Fred Emery in the early 1950s at the Tavistock Institute of Human Relations. The theory posits that organizational effectiveness is achieved when the social system (people, communication, teamwork, and leadership) and the technical system (tools, technologies, processes, and work methods) are effectively integrated and managed. It emphasizes that organizational performance depends on the joint optimization of both systems rather than focusing on one at the expense of the other.

The theory is relevant to this study because Agile Scrum practices constitute the technical system, while team collaboration, communication, and coordination represent the social system. The effective integration of these two systems enhances collaboration and project performance in construction projects. Therefore, the STS Theory provides a suitable theoretical foundation for assessing the effectiveness of Agile Scrum practices in enhancing team collaboration in Port Harcourt construction projects.

Empirical Studies

Prakash, Maddulety and Bhoola (2022) examined Factors Influencing Adoption of Agile Project Management in Construction Industry in India. The variables studied included Scrum practices, organizational culture, communication intensity, and project adaptability. The study adopted a quantitative survey research design. Data were analyzed using Structural Equation Modelling. The findings showed that Agile Scrum practices such as daily stand up meetings, sprint planning, and iterative development were more likely to be adopted in organizations with flexible structures and strong communication systems, and these practices improved project adaptability.

Okeke and Nnamani (2023) examined Factors Influencing Agile Scrum Adoption in Construction Projects in Enugu State, Nigeria. The variables studied included organizational culture, workforce competence, communication barriers, and Scrum collaboration effectiveness. The study adopted a cross sectional survey design. Data were analyzed using logistic regression analysis. The findings showed that poor organizational culture, lack of technical training, and weak communication systems significantly hindered Agile Scrum collaboration in construction project environments.



Obi and Chukwu (2025) investigated Scrum Practices and Coordination of Construction Teams in Rivers State, Nigeria. The study focused on variables such as sprint review, daily stand up meetings, coordination, and project efficiency. A survey research design was adopted. Data were analyzed using correlation and regression analysis. The findings indicated that Scrum practices significantly improved coordination among construction teams, especially through continuous communication and regular feedback sessions.

Akinwale and Bello (2022) examined the Impact of Training and Funding Constraints on Agile Scrum Practices in Construction Firms in Lagos State, Nigeria. The study focused on variables such as training level, funding availability, organizational structure, and Scrum effectiveness. A descriptive survey research design was used. Data were analyzed using Pearson correlation and regression analysis. The findings revealed that inadequate training and insufficient funding significantly reduced the effectiveness of Scrum practices in construction projects.

METHODOLOGY

Research Design

This study adopts a survey research design, which is suitable for collecting reliable data from a defined population using structured questionnaires. It is appropriate because it helps capture the opinions and perceptions of construction professionals on the effectiveness of Agile Scrum practices in improving team collaboration in Port Harcourt construction projects.

Population of the Study

The population of this study comprises construction professionals working in selected construction firms in Port Harcourt, Rivers State.

Table 1: Breakdown of Population of the Study

S/N	Professional Category	Julius Berger	Setraco Nigeria Ltd	Dantata & Sawoe	Total
1	Project Managers	12	10	8	30
2	Site Engineers	40	30	28	98
3	Quantity Surveyors	18	15	14	47
4	Architects	15	12	10	37
5	Site Supervisors	35	28	25	88
	Total	120	95	85	300

Source: *Personnel Departments of Selected Construction Firms, 2026.*

Determination of Sample Size

The sample size for this study is determined using the Taro Yamane (1967) statistical formula, which is appropriate for finite populations and is widely used in social science research to obtain a representative sample size from a known population.



$$n = \frac{N}{1 + N(\epsilon)^2}$$

The formula is stated as:

Where:

n = sample size

N = population size

e = level of significance (0.05)

From the study population:

N = 300

Substituting into the formula:

$$n = \frac{300}{1 + 300(0.05)^2}$$

$$n = \frac{300}{1 + 300(0.0025)}$$

$$n = \frac{300}{1 + 0.75}$$

$$n = \frac{300}{1.75}$$

$$n = 171.43 \approx 171$$

Therefore, the sample size for this study is 171 respondents drawn from the selected construction firms in Port Harcourt.

Method of Data Collection

Data was collected using a structured questionnaire, which enabled the efficient gathering of uniform responses from a large number of respondents for easy statistical analysis.

Method of Data Analysis

Data were analyzed using frequency tables and percentages. This was used to summarize the demographic characteristics of respondents and to present responses on Agile Scrum practices and team collaboration in a clear and interpretable manner. This helped in organizing and describing the patterns of responses obtained from the questionnaire.



RESULTS AND DISCUSSION

Questionnaire Return Rate

A total of 171 copies of the questionnaire were distributed to respondents across the selected construction firms in Port Harcourt. Out of this number, 167 copies were properly completed and returned, while 4 copies were not returned. This represents a response rate of 97.7% and a non-response rate of 2.3%. The high response rate indicates adequate participation of respondents in the study and provides sufficient data for the analysis.

Table 1: Responses on Agile Scrum Practices Currently Adopted in Construction Projects in Port Harcourt

S/N	Questionnaire Items	SA	A	N	D	SD	Mean
1	Sprint planning is regularly practiced in construction projects in Port Harcourt.	72 (43.1%)	61 (36.5%)	15 (9.0%)	11 (6.6%)	8 (4.8%)	4.07
2	Daily stand-up meetings are adopted to improve communication among project teams.	68 (40.7%)	64 (38.3%)	14 (8.4%)	13 (7.8%)	8 (4.8%)	4.02
3	Sprint review sessions are conducted to assess project progress and outcomes.	63 (37.7%)	69 (41.3%)	16 (9.6%)	10 (6.0%)	9 (5.4%)	4.00
4	Iterative planning and continuous feedback are commonly used in construction project execution.	70 (41.9%)	62 (37.1%)	13 (7.8%)	12 (7.2%)	10 (6.0%)	4.02

Source: Field Survey, 2026.

The result presented in Table 1 indicates that Agile Scrum practices are currently adopted in construction projects in Port Harcourt. The findings show that the majority of respondents strongly agreed and agreed that sprint planning, daily stand-up meetings, sprint review sessions, and iterative planning with continuous feedback are practiced within construction project teams. The mean scores for all the items are above the criterion mean of 3.00, indicating positive acceptance by respondents. This suggests that Agile Scrum practices have gained reasonable recognition and adoption among construction professionals in Port Harcourt.

**Table 2: Responses on Factors Hindering Agile Scrum Collaboration in Construction Projects in Port Harcourt**

S/N	Questionnaire Items	SA	A	N	D	SD	Mean
1	Resistance to change among employees hinders the effective implementation of Agile Scrum practices.	74 (44.3%)	60 (35.9%)	12 (7.2%)	13 (7.8%)	8 (4.8%)	4.08
2	Inadequate training on Agile Scrum practices affects collaboration among construction teams.	71 (42.5%)	63 (37.7%)	11 (6.6%)	14 (8.4%)	8 (4.8%)	4.05
3	Poor communication systems hinder effective Scrum collaboration in construction projects.	69 (41.3%)	65 (38.9%)	10 (6.0%)	15 (9.0%)	8 (4.8%)	4.04
4	Rigid organizational structures negatively affect the adoption of Agile Scrum collaboration.	73 (43.7%)	58 (34.7%)	14 (8.4%)	13 (7.8%)	9 (5.4%)	4.03

Source: *Field Survey, 2026.*

The result presented in Table 2 reveals that several factors hinder the effective implementation of Agile Scrum collaboration in construction projects in Port Harcourt. The majority of respondents strongly agreed and agreed that resistance to change, inadequate training, poor communication systems, and rigid organizational structures are major barriers to effective Scrum collaboration. The mean scores for all the items are above the benchmark mean of 3.00, indicating general agreement among respondents. This implies that these identified factors significantly affect the successful adoption and practice of Agile Scrum collaboration within construction project teams in Port Harcourt.

Table 3: Responses on the Effectiveness of Scrum Practices in Enhancing Team Coordination in Port Harcourt Construction Projects

S/N	Questionnaire Items	SA	A	N	D	SD	Mean
1	Sprint planning improves coordination of tasks among construction team members.	76 (45.5%)	58 (34.7%)	13 (7.8%)	12 (7.2%)	8 (4.8%)	4.09
2	Daily stand-up meetings enhance communication and coordination among project teams.	72 (43.1%)	61 (36.5%)	12 (7.2%)	14 (8.4%)	8 (4.8%)	4.05
3	Sprint review sessions improve alignment of project goals and team activities.	68 (40.7%)	65 (38.9%)	13 (7.8%)	12 (7.2%)	9 (5.4%)	4.02



4	Time boxing helps construction teams complete tasks within scheduled timeframes.	74 (44.3%)	59 (35.3%)	11 (6.6%)	14 (8.4%)	9 (5.4%)	4.05
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Source: *Field Survey, 2026.*

The findings presented in Table 3 indicate that Scrum practices are effective in enhancing team coordination in construction projects in Port Harcourt. The majority of respondents strongly agreed and agreed that sprint planning, daily stand-up meetings, sprint review sessions, and time boxing improve communication, task alignment, and timely execution of project activities among construction teams. The mean scores for all the items are above the criterion mean of 3.00, showing positive acceptance of the statements. This implies that Scrum practices significantly contribute to improved coordination and teamwork within construction project environments in Port Harcourt.

Table 4: Responses on the Impact of Identified Factors on Scrum Practices in Port Harcourt Construction Projects

S/N	Questionnaire Items	SA	A	N	D	SD	Mean
1	Organizational culture significantly affects the effectiveness of Scrum practices in construction projects.	75 (44.9%)	59 (35.3%)	12 (7.2%)	13 (7.8%)	8 (4.8%)	4.08
2	Lack of management support negatively impacts the implementation of Scrum practices.	73 (43.7%)	61 (36.5%)	11 (6.6%)	14 (8.4%)	8 (4.8%)	4.06
3	Inadequate technological infrastructure reduces the effectiveness of Agile Scrum practices.	70 (41.9%)	64 (38.3%)	12 (7.2%)	13 (7.8%)	8 (4.8%)	4.05
4	Low employee readiness and training negatively affect Scrum practice implementation.	74 (44.3%)	58 (34.7%)	14 (8.4%)	12 (7.2%)	9 (5.4%)	4.03

Source: *Field Survey, 2026.*

The findings presented in Table 4 reveal that the identified factors have significant impacts on Scrum practices in construction projects in Port Harcourt. The majority of respondents strongly agreed and agreed that organizational culture, management support, technological infrastructure, and employee readiness influence the effectiveness of Agile Scrum practices. The mean scores for all the questionnaire items are above the benchmark mean of 3.00, indicating respondents' agreement with the statements. This suggests that these factors play critical roles in determining the successful implementation and effectiveness of Scrum practices within construction project environments in Port Harcourt.

**Table 5: Responses on Strategies for Effective Implementation of Agile Scrum Practices in Construction Projects in Port Harcourt**

S/N	Questionnaire Items	SA	A	N	D	SD	Mean
1	Continuous training and workshops should be organized to improve Agile Scrum knowledge among construction professionals.	78 (46.7%)	57 (34.1%)	12 (7.2%)	11 (6.6%)	9 (5.4%)	4.10
2	Construction firms should provide adequate technological tools to support Scrum practices.	74 (44.3%)	60 (35.9%)	11 (6.6%)	13 (7.8%)	9 (5.4%)	4.06
3	Management support and commitment are necessary for successful Scrum implementation.	76 (45.5%)	58 (34.7%)	12 (7.2%)	12 (7.2%)	9 (5.4%)	4.07
4	Flexible organizational structures should be encouraged to enhance team collaboration and Scrum effectiveness.	72 (43.1%)	62 (37.1%)	11 (6.6%)	13 (7.8%)	9 (5.4%)	4.05

Source: Field Survey, 2026.

The findings presented in Table 5 indicate that several strategies can enhance the effective implementation of Agile Scrum practices in construction projects in Port Harcourt. The majority of respondents strongly agreed and agreed that continuous training, provision of technological tools, management support, and flexible organizational structures are important strategies for improving Scrum practices and team collaboration. The mean scores for all the questionnaire items are above the criterion mean of 3.00, indicating general acceptance of the proposed strategies by respondents. This implies that adopting these measures would significantly improve the effectiveness of Agile Scrum practices and strengthen collaboration among construction project teams in Port Harcourt.

CONCLUSION AND RECOMMENDATIONS

Conclusion

The study concludes that Agile Scrum practices are increasingly being adopted in Port Harcourt construction projects and are effective in improving team coordination and collaboration through better communication, task alignment, and iterative feedback. However, their full effectiveness is limited by challenges such as resistance to change, inadequate training, poor communication systems, and rigid organizational structures. Successful implementation therefore depends on supportive organizational culture, leadership, infrastructure, and employee readiness.



Recommendations

- i. Construction firms in Port Harcourt should integrate Agile Scrum practices such as sprint planning, daily stand-ups, sprint reviews, and iterative feedback to enhance teamwork and project efficiency.
- ii. Management should organize continuous training and development programs to improve staff competence in Agile Scrum implementation.
- iii. Organizations should embrace more flexible, decentralized structures that foster open communication, teamwork, and quicker decision-making.
- iv. Appropriate digital tools and project management systems should be provided to improve coordination, monitoring, and real-time communication.
- v. Leadership should show strong commitment to Agile adoption to encourage acceptance and minimize resistance among employees.
- vi. Stakeholders should encourage a collaborative culture that supports knowledge sharing and continuous improvement for sustainable Scrum practice.

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