Towards a Hybrid Project Management for Construction Delivery

Matthew Ikuabe[1], Clinton Aigbavboa[2], Ntebo Ngcobo[3] and Seyi Stephen[2]

[1] School of Construction Economics and Management, University of the Witwatersrand, South Africa
[2] SARChI in Sustainable Construction Management and Leadership in the Built Environment, Faculty of Engineering and the Built Environment, University of Johannesburg, South Africa
[3] Department of Civil Engineering Technology, Faculty of Engineering and the Built Environment, University of Johannesburg, Johannesburg, South Africa

ikuabematthew@gmail.com

Abstract
The delivery of construction projects using the traditional project management approach is characterised by a plethora of challenges. This has necessitated the shift towards other approaches that can aid in abating some of these associated bottlenecks, and one such is the hybrid project management approach. Consequently, the study evaluated the benefits of deploying the hybrid project management approach for construction delivery in South Africa. A quantitative methodology was employed, aided by the use of a questionnaire for data collection from the purposively sampled construction professionals. The retrieved data was analysed using mean item score, standard deviation, and one-sample *t*-test. The study's findings portray that the most significant benefits of the shift from traditional project management to hybrid project management for construction delivery are improved collaboration between project stakeholders, increased productivity, and timely delivery of projects. The study's outcome helps unlock potential accruals from implementing hybrid project management in the South African construction industry. Conclusively, recommendations were proffered on how the shift towards hybrid project management can be seamlessly achieved.

Keywords
Construction Management, Project Management, Hybrid, Project Delivery.

1. Introduction

Project management is a fundamental aspect of any construction project delivery. According to Åsgård and Jørgensen (2019) and Ikuabe et al. (2020), the success of a construction project can be measured within the ambits of several yardsticks, which include completion within the stipulated time, budget, quality, client satisfaction, and safety requirements etc. To support an effective approach to construction, a calculated overview of the management and implementation of projects is crucial to establish the best methods and techniques to be employed (Ozorhon et al., 2022; Ikuabe and Oke, 2020). In contextual terms, project management aids the application of knowledge, skills, tools, and techniques to project activities to reach a project's requirements. However, the construction industry has distinct qualities that differentiate it from other industries. This is largely due to its fragmented nature while also accounting for the accommodation of the interests of various stakeholders (Ikuabe et al., 2023). These attributes have led to a plethora of challenges experienced in the delivery of construction projects using the traditional mode of project management.

Conventionally, construction organizations experience difficulties in seeking a cohesive fusion of resources, required skills, and technology for the delivery of projects due to the dynamic nature of the industry's business environment (Ikuabe et al., 2021). Furthermore, Aghimien et al., (2024) noted that traditional challenges posed to construction projects, which include low productivity, poor performance, insufficient quality, delays in project schedule, and cost overruns, are most often linked with the complexity of project management. Furthermore, these problems have attracted attention, and thus, there is a dire need for customized management methodology. One such of these methods is hybrid project management. This system of project management aims to maintain the predictability of a traditional approach while at the same time allowing increased agility (Salameh, 2014). Ultimately, the hybrid

project management approach seeks to leverage the advantages of various methodologies of project management and eliminate their pitfalls, with the anticipation of making a closely fused approach with better deliverability (Lalmi et al., 2021).

The hybrid project management approach can be attributed to a number of benefits. According to Reiff and Schelegel (2022), this approach presents an increase in efficiency in the delivery of construction projects. Due to the selection of several methods and approaches, a desired tool can be applied depending on the scope of the project; in this manner, the project benefits will be increased under specific conditions, better results will be realized, and the goal can be achieved. Moreover, Archer and Kaufman (2013) noted that this methodology aids in the reduction of project time and cost. The model encourages the combination of the traditional and agile methods through conscientious application and leveraging the advantages of the adopted methodologies. Also, the hybrid project management for construction project delivery seeks to enhance productivity. The methodology yields impressive results in terms of productivity, arising from its streamlined nature and collaborative nature (Salameh, 2014). Likewise, the approach is projected to yield a reduction in uncertainties associated with construction project delivery. Getyengana (2020) outlined that the incorporation of the agile approach into the traditional method provides a system that enhances areas such as communication and documentation/reporting. And providing continued feedback from the business iterative process, which helps attain realistic goals.

The shift towards the use of hybrid project management for construction project delivery seeks to proffer solutions to some of the inherent challenges confronting the construction industry. As outlined in the preceding paragraph, this methodology also ushers in some benefits, ultimately to the industry's advantage. Based on this backdrop, this study seeks to evaluate the benefits of the deployment of hybrid project management in the South African construction industry. This is with a view to preferring recommendations that would aid in fostering the need for a navigational change among construction professionals for the industry's overall development. The outcome of the study will be of immense benefit to industry professionals and other stakeholders saddled with the responsibility of policy formulation in the South African construction industry.

2. Methodology

The study seeks to explore the benefits of the deployment of hybrid project management in the South African construction industry. Using a quantitative technique, a questionnaire was used for data collection which sought responses from the target respondents. These respondents comprised construction professionals, including quantity surveyors, architects, project managers, and engineers. The study area was Gauteng province in South Africa. The choice of the study area stems from its accommodation of a large pool of construction professionals and its hosting of several construction projects of various sizes. Purposive and snowball sampling techniques were employed. A total number of seventy-five responses was retrieved and deemed appropriate for analysis. The methods of data analysis were mean item score, standard deviation, and one-sample *t*-test. Also, Cronbach's alpha test was used to evaluate the research instrument's validity and reliability. The result gave an alpha value of 0.902, confirming the research instrument's suitability (Tavakol and Dennick, 2011).

3. Results

After reviewing extant literature, the study identified the benefits of deploying hybrid project management. These benefits were subsequently presented to the target respondents of the study for rating based on their significance. The respondents gave their views using a 5-point Likert scale ranging from non-significant to very significant. Adopting the one-sample t-test as the method of data analysis, the study postulated a hypothesis. The null hypothesis states that a benefit is insignificant if the mean value given is less than or equal to the population mean (H_0: $U \leqslant U_0$), while the alternate hypothesis states that a benefit is significant if the mean value given is greater than the population mean (H_a: $U > U_0$). A population mean (U_0) of 3.50 was set for the study. Consequently, any benefit whose resulting mean value is above 3.50 is considered significant, and any benefit whose resulting mean value is less than or equal to 3.50 is considered insignificant. Table 1 outlines the results of the one-sample *t*-test, which indicates that the identified benefits of deploying hybrid project management are significant as they have a *p*-value less than 0.05 at a 95% confidence level.

2.

Table 1. One-Sample Test

Benefits	Test Value = 3.50					
					95% Confidence Interval of the Difference	
	T	df	Sig. (*2-tailed*)	MD	L	U
Increased productivity	2.337	74	0.000	0.284	0.3821	1.0836
Improved stakeholder engagement	1.081	74	0.000	0.339	0.7992	1.1992
Reduction of uncertainties	4.942	74	0.000	0.917	0.6183	1.3815
Platform for innovativeness	5.358	74	0.000	0.421	0.5017	1.4932
Optimised resource utilisation	1.008	74	0.000	0.803	0.4321	1.7728
Timely delivery of projects	7.694	74	0.000	0.776	0.5284	1.5645
Cost optimisation	6.279	74	0.000	0.305	0.6633	1.4722
Better documentation and control	1.743	74	0.000	0.739	0.2927	1.1004
Better approach to risk management	3.594	74	0.000	1.277	0.7112	1.3916
Project phased delivery	4.522	74	0.000	0.416	0.5725	1.5503
Better investment returns	2.975	74	0.000	1.634	0.4175	1.3822
Improvement in customer satisfaction	6.721	74	0.000	0.392	0.3281	1.0062

N.B: MD=Mean Difference; L=Lower Limit; U=Upper Limit

Table 2 shows the result of the ranked benefits of deploying hybrid project management for construction delivery in South Africa. The findings indicate that all the identified benefits have a mean value greater than 3.50, which is the cut-off set for the study. Accordingly, this affirms the alternate hypothesis proposed in the study (H_a: $U > U_0$)., i.e., a benefit is significant when the mean value given is greater than the population mean. Moreover, it is revealed that the derived p-values of the benefits at a 95% confidence level have a value less than 0.05, thus indicating that they are significant. The results show that the most significant benefits of the deployment of hybrid project management are improved stakeholder engagement (*MIS=4.25, sig.=0.000*), increased productivity (*MIS=4.23, sig.=0.000*), timely delivery of projects (*MIS=4.20, sig.=0.000*), reduction of uncertainties (*MIS=4.15, sig.=0.000*), and better investment returns (*MIS=4.12, sig.=0.000*).

2.

Table 2. Summary of *t*-test showing rankings of the identified benefits

Benefits	Mean	Std. Deviation	Sig. (*2-tailed*)	Rank
Improved stakeholder engagement	4.25	0.730	0.000	1
Increased productivity	4.23	0.724	0.000	2
Timely delivery of projects	4.20	0.754	0.000	3
Reduction of uncertainties	4.15	0.815	0.000	4
Better investment returns	4.12	0.781	0.000	5
Platform for innovativeness	4.09	0.805	0.000	6
Better approach to risk management	4.08	0.835	0.000	7
Optimised resource utilisation	4.03	0.770	0.000	8
Improvement in customer satisfaction	4.03	0.901	0.000	9
Project phased delivery	3.98	0.800	0.000	10
Better documentation and control	3.98	0.820	0.000	11
Cost optimisation	3.97	0.918	0.000	12

4. Discussion of Findings

To assess the benefits of the deployment of hybrid project management in the South African construction industry, the views of construction professionals were sought. The findings from the analysis of the retrieved data show that the improvement of engagement among stakeholders in construction project delivery is imperative. This outcome is corroborated by Salameh (2014), who noted that due to the fusion of the different methodologies of project management, hybrid project management seeks to leverage on their individual capabilities, thus improving the engagement and synergy among stakeholders. Also, hybrid project management guarantees an improvement in the deliverables of project outcomes. Hence, the approach seeks to produce improved results aligned with pre-determined project objectives, which ultimately improves productivity (Reiff and Schelegel, 2022). Furthermore, the study shows that timely delivery of construction projects is a significant benefit of the deployment of hybrid project management. This is affirmed by Archer and Kaufman (2013), who noted that the approach aids in the reduction of project time and cost. Since the model encourages the combination of the traditional and agile methods through conscientious application, leveraging on the advantages of the adopted methodologies.

5. Conclusion and Recommendations

The shift towards a better and more efficient project management approach is necessitated by the plethora of challenges associated with the traditional project management methodology. This study evaluated the benefits of deploying hybrid project management in construction delivery in South Africa. The review of extant literature outlined the benefits of the utilization of hybrid project management, which was fed into the research instrument formulated for the study. Opinions of the significance of these benefits were sought from construction professionals, and the retrieved data was analyzed appropriately. The findings of the analyzed data indicated that the most significant benefits of the approach are improved collaboration between project stakeholders, increased productivity, and timely delivery of projects. The outcome of this study portrays that the implementation of hybrid project management for project delivery in South Africa would be of immense benefit while also abating a number of the challenges confronting construction project execution. On this premise, the study recommends that periodic sensitization should be conducted by professional bodies in the construction sector for its members. The South African Council for Project and Construction Management Professions should prioritize its members' training and skills development on hybrid project management deployment for better project delivery.

References

Aghimien, D., Ikuabe, M., Aghimien, L., Aigbavboa, C., Ngcobo, N., and Yankah, J. (2024). PLS-SEM Assessment of The Impediments of Robotics and Automation Deployment for Effective Construction Health and Safety. *Journal of Facilities Management*, 22(3), 458-478 https://doi.org/10.1108/JFM-04-2022-0037

2.

Archer, S., and Kaufman, C. (2013). Accelerating Outcomes with a Hybrid Approach Within a Waterfall Environment, Paper presented at PMI® Global Congress 2013—North America, New Orleans, LA. Retrieved from http://www.pmi.org [Assessed on 23/09/2023].

Åsgård, T., and Jørgensen, L. (2019). Health and Safety in Early Phases of Project Management in Construction. *Procedia Computer Science*, 164, 343–349 https://doi.org/10.1016/j.procs.2019.12.192

Getyengana, N. (2020). *Effective Implementation of A Hybrid Project Management Methodology Combining Agile and Traditional Methods For IT-Based Projects in South African Organisations*. Unpublished MSc dissertation submitted to the University of Pretoria, South Africa.

Ikuabe, M., Aghimien, D., Aigbavboa, C., and Oke, A.E. (2020). Exploring the Adoption of Digital Technology at the Different Phases of Construction Projects in South Africa. *International Conference on Industrial Engineering and Operations Management*, Dubai, UAE, March 10-12, 1553-1561.

Ikuabe, M., Aigbavboa, C., Oke, A., Aghimien, D., and Thwala, W. (2021). Contextualizing Foreign Investments in the Nigerian Construction Industry, In:Trzcielinski, S., Mrugalska, B., Karwowski, W., Rossi, E., Di Nicolantonio, M. (eds) *Advances in Manufacturing, Production Management and Process Control. AHFE 2021*. Lecture Notes in Networks and Systems, 274. Springer, Cham https://doi.org/10.1007/978-3-030-80462-6_35

Ikuabe, M., Aigbavboa, C., Oke, A., Adekunle, S., and Khambule, S. (2023). Key Leadership Skills for Effective Project Delivery: Placing the Lens on Construction 4.0. In: Clinton Aigbavboa, Emmanuel Oke and Wellington Thwala (eds) Sustainable Construction in the Era of the Fourth Industrial Revolution. *AHFE (2023) International Conference*. AHFE Open Access, 107. AHFE International, USA http://doi.org/10.54941/ahfe1003098

Ikuabe, M. and Oke, A.E. (2020). Contractors' Opportunism: Construction Professionals' Awareness of Influencing Factors. *Journal of Engineering, Design and Technology*, 17(1), 102-114 https://doi.org/10.1108/JEDT-03-2018-0054

Lalmi, A., Fernandes, G., and Souad, S. (2021). A Conceptual Hybrid Project Management Model for Construction Projects. *CENTERIS - International Conference on ENTERprise Information Systems / ProjMAN - International Conference on Project MANagement / HCist - International Conference on Health and Social Care Information Systems and Technologies* 2020, Procedia Computer Science, 181, 921-930, https://doi.org/10.1016/j.procs.2021.01.248

Ozorhon, B., Cardak, F. and Caglayan, S. (2022). Investigating the Agile Hybrid Approach in Construction. *Journal of Management in Engineering*, 38(4) https://doi.org/10.1061/(ASCE)ME.1943-5479.0001052

Reiff, J., and Schlegel, D. (2022). Hybrid Project Management – A Systematic Literature Review. *International Journal of Information Systems and Project Management*, 10(2), 45–63 https://doi.org/10.12821/ijispm100203

Salameh, H. (2014). What, When, Why, and How? A comparison between agile project management and traditional project management methods. *International Journal of Business and Management Review*, 2(5), 52-74.

Tavakol, M. and Dennick, R. (2011). Making sense of Cronbach's Alpha. *International Journal of Medical Education*, 2, 53-55, 2011.