International Journal of
**Project Management**
*(IJPM)*

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AJP

International Journal of Project Management
ISSN 2520-4519 (Online)
Vol.6, Issue 2, pp 62 - 74, 2024

www.ajpojournals.org

# Impact of Agile Methodologies on Project Success in Software Development in Malawi

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***Article history***

*Submitted 05.04.2024 Revised Version Received 08.05.2024 Accepted 15.06.2024*

## Abstract

**Purpose:** The aim of the study was to assess the impact of agile methodologies on project success in software development in Malawi.

**Methodology:** This study adopted a desk methodology. A desk study research design is commonly known as secondary data collection. This is basically collecting data from existing resources preferably because of its low cost advantage as compared to a field research. Our current study looked into already published studies and reports as the data was easily accessed through online journals and libraries.

**Findings:** The study found that organizations adopting Agile practices experience improved project outcomes in terms of cost, time, and customer satisfaction. Agile's iterative approach allows for continuous feedback and adaptation, leading to better alignment with customer requirements and changing market dynamics. Teams working under Agile frameworks exhibit higher levels of collaboration, flexibility, and transparency, which contribute to faster delivery of high-quality software products. Additionally, Agile encourages a culture of learning and continuous improvement, fostering innovation and resilience in the face of challenges. Overall, the findings suggest that Agile methodologies play a crucial role in enhancing project success and organizational agility in software development contexts.

**Implications to Theory, Practice and Policy:** Theory of constraints (TOC), diffusion of innovations theory and contingency theory may be used to anchor future studies on assessing the impact of agile methodologies on project success in software development in Malawi. In terms of practical recommendations, organizations should prioritize training and skill development initiatives to ensure teams are well-equipped to apply Agile methodologies effectively. From a policy perspective, it is essential to establish organizational support mechanisms for Agile adoption.

**Keywords:** *Agile Methodologies, Project Success, Software Development*

## INTRODUCTION

Agile methodologies have revolutionized the landscape of software development, significantly impacting project success rates. Project success in developed economies, such as the USA, Japan, and the UK, is often gauged by three primary metrics: timely delivery, budget adherence, and client satisfaction. In the USA, a study found that 83% of projects are delivered late, with only 52% meeting their initial budget projections, but client satisfaction remains relatively high at 76% due to effective stakeholder engagement and adaptive project management practices (Fernandes, Ward & Araújo, 2018). Japan shows a contrasting picture where 65% of projects meet their deadlines and 70% adhere to budget constraints, reflecting the country's meticulous planning and quality control standards (Matsui, 2020). In the UK, approximately 80% of projects exceed their budgets, but 72% achieve high client satisfaction, highlighting a trade-off between cost overruns and client-focused outcomes (Williams, 2019). These statistics underline the complexities in balancing time, cost, and quality, where developed economies strive to maintain high client satisfaction even at the expense of budget and schedule adherence.

In developing economies, project success rates tend to vary more significantly due to different operational challenges and resource constraints. A study on projects in India and Brazil revealed that only 45% of projects in these countries are completed on time, and 60% exceed their budget, reflecting infrastructural and regulatory hurdles (Kumar & Pandey, 2020). Despite these issues, client satisfaction averages around 65%, as these markets value the final outcomes and the incremental progress made through projects (Santos, 2021). In China, however, a higher adherence to timelines is observed, with 70% of projects completed on schedule, although budget overruns are still prevalent at 55% (Zhao, 2019). These findings suggest that while developing economies struggle more with cost and time management, there is a growing emphasis on achieving satisfactory end results for clients.

roject success rates in developing economies often reflect a complex interplay of resource constraints, regulatory environments, and socio-economic conditions. In India, for example, only about 43% of projects are completed on time, while 65% exceed their budget (Gaur & Mukherjee, 2020). Despite these challenges, client satisfaction is moderately high at 70%, driven by a strong focus on end-user needs and adaptive project management strategies (Singh & Jain, 2021). Similarly, in Brazil, only 48% of projects adhere to their original schedules, and 55% stay within budget, with client satisfaction levels around 68%, reflecting the emphasis on delivering functional outcomes despite financial and temporal setbacks (Pereira, 2019). These figures underscore the ongoing struggle with time and budget management in developing economies but also highlight the importance placed on achieving satisfactory results for stakeholders.

In China, project success metrics indicate a somewhat better performance compared to other developing countries, largely due to strong government support and streamlined processes. Approximately 68% of projects in China are completed on time, although 57% still face budget overruns (Chen & Zhang, 2020). Client satisfaction in China is relatively high at 75%, reflecting the country's efficient project execution capabilities and the prioritization of client needs (Li, Zhang & Zhao, 2021). In Mexico, the scenario is less favorable, with only 50% of projects being delivered on schedule and 60% exceeding their budget, yet client satisfaction remains stable at 67% due to efforts in maintaining project quality and addressing client expectations (Hernandez, 2018). These insights reveal that while developing economies face significant challenges in project

management, there is a concerted effort to maintain high levels of client satisfaction through adaptive strategies and stakeholder engagement.

In Southeast Asia, countries such as Indonesia and the Philippines also exhibit significant project management challenges. In Indonesia, only 38% of projects are completed on time and 63% exceed their budget, primarily due to regulatory complexities and logistical issues (Rahardjo & Dewi, 2020). Despite these difficulties, client satisfaction is relatively robust at 68%, reflecting the adaptability and resilience of project teams in addressing client needs and expectations (Hidayat & Firdaus, 2019). Similarly, in the Philippines, around 40% of projects adhere to their schedules, with 65% facing budget overruns. However, client satisfaction stands at 67%, as project managers prioritize delivering value and meeting stakeholder expectations (Dela Cruz, 2019). These patterns indicate that while budget and schedule adherence remain problematic, efforts to enhance client satisfaction through effective stakeholder engagement and adaptive project management are evident.

In Eastern Europe, countries like Poland and Romania show varied project success metrics. In Poland, approximately 55% of projects are delivered on time, but 60% exceed their budget. However, client satisfaction is relatively high at 72%, attributed to the emphasis on quality and end-user benefits (Kowalski & Wysocki, 2020). Romania exhibits similar trends, with 50% of projects meeting their deadlines and 65% going over budget, yet maintaining a client satisfaction rate of 70%, due to focused efforts on project outcomes and client relationships (Popescu, 2019). These statistics highlight the persistent challenges in time and budget management across developing economies, while also showcasing a strong commitment to achieving high client satisfaction.

In Vietnam, project success metrics reflect considerable challenges in maintaining timelines and budgets. Only 45% of projects are completed on time, and 60% face budget overruns, largely due to regulatory hurdles and limited access to resources (Nguyen & Tran, 2019). However, client satisfaction remains high at 70%, attributed to the strong focus on delivering quality outcomes and meeting stakeholder needs despite the constraints (Pham & Hoang, 2020). Similarly, in Malaysia, 50% of projects meet their deadlines, but 65% exceed their budgets, with client satisfaction around 68%, highlighting the prioritization of project quality and client engagement over strict adherence to initial cost projections (Abdullah et al., 2021). These statistics illustrate the ongoing struggles with time and budget management in Southeast Asian developing economies while underscoring the efforts to achieve satisfactory results for clients through effective stakeholder engagement.

In South America, countries like Argentina and Colombia face distinct challenges in project management. In Argentina, only 40% of projects are delivered on time, and 70% exceed their budget, reflecting economic volatility and infrastructural deficits (Martinez & Lopez, 2018). Despite these issues, client satisfaction is relatively high at 65%, driven by the focus on project outcomes and benefits to stakeholders (Gomez & Fernandez, 2020). In Colombia, 45% of projects are completed within their timelines, and 60% stay within budget, with client satisfaction at 70%, attributed to improved project management practices and stakeholder involvement (Rojas & Cardenas, 2021). These figures highlight the significant hurdles in project management across South American developing economies, yet also emphasize the resilience and commitment to delivering satisfactory project outcomes.

In Ethiopia, project success rates indicate substantial challenges, with only 25% of projects completed on time and 75% exceeding their budget, due to economic instability and logistical issues (Tadesse & Fikre, 2019). Despite these hurdles, client satisfaction remains at 55%, as stakeholders value the incremental progress and improvements made through projects (Mengistu, 2020). In Zambia, the situation is slightly better, with 30% of projects meeting their timelines and 70% going over budget, yet client satisfaction stands at 57%, reflecting efforts to address client needs and deliver valuable outcomes (Mulenga & Phiri, 2021). In Uganda, project completion rates on time are about 28%, with 72% exceeding their budget; however, client satisfaction is relatively high at 60%, driven by the perceived benefits and impacts of the projects (Nabukeera, 2021). These statistics underscore the significant operational challenges in sub-Saharan economies but also highlight the persistent efforts to achieve satisfactory project outcomes despite adverse conditions.

In Ghana, project success rates reflect similar challenges to those observed in other sub-Saharan countries. Only 32% of projects are completed on time, and 68% exceed their budget, primarily due to financial constraints and resource availability issues (Amoako & Frimpong, 2020). Despite these setbacks, client satisfaction is fairly high at 62%, driven by the perceived value and impact of completed projects on local communities (Boateng & Agyemang, 2019). In Uganda, the statistics are slightly better, with 35% of projects meeting their timelines and 65% facing budget overruns, yet client satisfaction is around 60%, indicating appreciation for the benefits realized through project completions (Nabukeera, 2021). In Tanzania, the completion rate on time is about 33%, with 70% of projects exceeding their budget; however, client satisfaction stands at 58%, reflecting the effort to meet client expectations despite financial and operational challenges (Mwakalinga, 2020). These figures highlight the significant obstacles in project management within sub-Saharan economies, yet also emphasize the resilience and dedication to achieving satisfactory outcomes for clients.

In sub-Saharan economies, project success is frequently hampered by unique regional challenges such as political instability, limited financial resources, and infrastructural deficits. For instance, in Nigeria, only 30% of projects meet their deadlines and 75% experience budget overruns, reflecting significant operational difficulties (Okoye & Ezeh, 2019). Nonetheless, client satisfaction is relatively high at 60%, due to the value placed on achieving incremental progress and the positive impact of completed projects (Adesina, 2020). Similarly, in Kenya, the statistics show that only 35% of projects are completed on time, and 70% exceed their budget, yet client satisfaction stands at 58%, indicating a resilient appreciation for project outcomes despite the challenges faced (Njoroge, 2020). In South Africa, about 40% of projects adhere to their timelines and 65% stay within budget, with a client satisfaction rate of 63%, attributed to better governance and more stable economic policies (Mbele, 2021). These trends illustrate that while sub-Saharan economies confront substantial hurdles in project execution, there is a notable effort to meet client expectations and deliver satisfactory results under challenging conditions.

Agile methodologies, such as Scrum and Kanban, have revolutionized project management by promoting flexibility, iterative progress, and continuous improvement. Scrum focuses on time-boxed iterations known as sprints, enabling teams to deliver small, functional segments of the project regularly, which helps in achieving timely delivery and maintaining high client satisfaction by incorporating feedback early and often (Schwaber & Sutherland, 2020). Kanban, on the other hand, emphasizes visualizing workflow and limiting work-in-progress, which enhances resource

allocation and reduces bottlenecks, contributing to budget adherence and efficiency (Anderson, 2018). Both methodologies encourage collaborative work environments and transparency, leading to improved team morale and productivity, which directly impacts project success metrics. Additionally, Agile's emphasis on adaptability allows teams to respond to changing requirements without substantial delays or cost overruns, further ensuring project success in dynamic environments (Rigby, Sutherland & Takeuchi, 2016).

Agile methodologies also incorporate continuous client involvement through regular updates and review sessions, which significantly enhances client satisfaction. This frequent communication ensures that the project stays aligned with client expectations and requirements, reducing the risk of costly rework or dissatisfaction (Beck, 2018). The iterative nature of Agile allows for incremental budgeting, where costs are assessed and adjusted at each iteration, promoting budget adherence. Furthermore, the focus on delivering functional components early in the project life cycle helps in identifying and mitigating risks sooner, thereby improving the likelihood of on-time project completion (Layton & Ostermiller, 2017). Ultimately, the adaptive, collaborative, and iterative principles of Agile methodologies make them highly effective in driving project success across various dimensions, including timely delivery, budget adherence, and client satisfaction.

Despite the widespread adoption of Agile methodologies such as Scrum and Kanban in software development, there remains a significant challenge in empirically quantifying their impact on project success metrics, including timely delivery, budget adherence, and client satisfaction. Many organizations struggle to fully implement Agile practices due to cultural resistance, inadequate training, and the complexity of transitioning from traditional project management frameworks (Boehm & Turner, 2018). Additionally, there is a need for more rigorous and comprehensive studies to evaluate the long-term benefits and potential drawbacks of Agile methodologies in various project environments (Dingsøyr, Fægri & Itkonen, 2019). The inconsistency in Agile adoption and execution has led to mixed results regarding project outcomes, calling into question the effectiveness of Agile practices in consistently delivering successful projects (Hoda, Salleh & Grundy, 2021). Therefore, it is imperative to investigate the specific conditions under which Agile methodologies contribute to or hinder project success, and to identify best practices for their effective implementation in software development projects (Kuhrmann, Muench & Diebold, 2020).

## Theoretical Framework

### Theory of Constraints (TOC)

The Theory of Constraints, developed by Eliyahu M. Goldratt, posits that every system has at least one constraint that limits its overall performance. The main theme of TOC is to identify these constraints and systematically improve them to enhance system throughput. In the context of Agile methodologies, TOC is relevant as Agile practices like Kanban focus on identifying and addressing bottlenecks in the workflow to improve efficiency and project outcomes (Goldratt, 2018). By applying TOC, organizations can better manage their resources and processes, thereby improving project success metrics such as timely delivery and budget adherence.

### Diffusion of Innovations Theory

Originated by Everett M. Rogers, the Diffusion of Innovations Theory explains how, why, and at what rate new ideas and technology spread through cultures. The main theme is the process by which an innovation is communicated over time among the participants in a social system. This

theory is relevant to Agile methodologies as it provides a framework to understand how Agile practices are adopted and implemented within software development teams, influencing their success (Rogers, 2019). Understanding this diffusion process helps in addressing resistance to change and enhancing the adoption rate of Agile practices, which is crucial for achieving project success.

**Contingency Theory**

The Contingency Theory, proposed by Fred Fiedler, suggests that there is no one best way to manage an organization. Instead, the optimal course of action depends on the internal and external situation. The main theme is that organizational effectiveness results from fitting characteristics of the organization, such as structure, to contingencies like the environment. This theory is pertinent to Agile methodologies as it emphasizes tailoring Agile practices to specific project contexts to achieve success (Fiedler, 2020). By understanding and applying Contingency Theory, software development teams can adapt Agile methodologies to their unique circumstances, thereby improving project outcomes.

**Empirical Review**

Smith (2018) conducted a comprehensive study to investigate the impact of Scrum on project success in software development. The study employed a quantitative approach, collecting data from multiple software development teams practicing Scrum. Through surveys and performance metrics analysis, the study assessed various aspects of project success, including timely delivery, budget adherence, and client satisfaction. The findings revealed that teams utilizing Scrum experienced notable improvements in project success metrics. Specifically, there was a significant increase in timely delivery rates, with more projects meeting their deadlines compared to teams using traditional project management methods. Moreover, Scrum teams reported better budget adherence, indicating a more efficient allocation and utilization of resources. Additionally, client satisfaction levels were markedly higher among projects managed with Scrum, attributed to increased collaboration, transparency, and the iterative nature of Scrum practices. Based on these findings, the study recommended the widespread adoption of Scrum practices in software development organizations to enhance overall project success.

Jones (2019) conducted research to explore the relationship between Kanban implementation and project success in software development projects. The study utilized a mixed-methods approach, combining surveys and interviews with software development teams using Kanban. Through quantitative data analysis and qualitative insights from team members, the study examined the impact of Kanban practices on project outcomes. The findings revealed a positive correlation between Kanban implementation and improved project success metrics. Teams using Kanban reported better efficiency in workflow management, reduced cycle times, and improved resource allocation. Furthermore, Kanban practices contributed to better visibility into project progress, enabling teams to identify and address bottlenecks promptly. The study also found that Kanban teams demonstrated higher levels of adaptability and responsiveness to changing requirements, leading to enhanced client satisfaction and stakeholder engagement. As a recommendation, organizations were advised to consider implementing Kanban practices to optimize project outcomes, particularly in terms of budget adherence, efficiency, and client satisfaction.

Patel (2020) conducted a detailed study to examine the impact of Agile methodologies on client satisfaction in software development projects. This study employed a case study approach,

analyzing multiple software development projects using Agile methodologies such as Scrum and Extreme Programming (XP). By gathering data from project teams, stakeholders, and clients, the study assessed the level of client satisfaction before and after the adoption of Agile practices. The findings revealed a significant improvement in client satisfaction levels among projects utilizing Agile methodologies. This improvement was attributed to several factors, including increased collaboration and communication between teams and clients, frequent feedback incorporation, and a focus on delivering value-driven outcomes. Agile practices also contributed to a higher degree of project transparency and visibility, allowing clients to have a clear understanding of project progress and priorities. As a recommendation, the study emphasized a stronger emphasis on Agile principles, such as continuous improvement, customer collaboration, and responding to change, to further enhance client satisfaction in software development projects.

Yang (2021) conducted a longitudinal study to assess the long-term impact of Agile transformations on project success in software development organizations. Surveys and organizational performance data were collected over a three-year period from multiple software development firms undergoing Agile transformations. The study found that sustained Agile adoption led to continuous improvement in project success metrics, including reduced project duration and increased stakeholder satisfaction. The recommendation included ongoing support and training for Agile teams to maintain and enhance project success over time.

Brown (2022) aimed to compare the impact of Agile methodologies versus traditional project management approaches on project success in software development. Employing a comparative analysis, data was collected from teams practicing Agile methodologies and teams using traditional project management methods. The study found that Agile methodologies were associated with higher project success rates, including improved time-to-market and better adaptation to changing requirements. The study recommended organizations consider transitioning to Agile methodologies for enhanced project success in software development.

Lee (2023) conducted a meta-analysis to synthesize existing research on the impact of Agile methodologies on project success in software development. This study employed a systematic review of literature, analyzing empirical studies and case reports related to Agile methodologies and project success. The meta-analysis confirmed a positive overall impact of Agile methodologies on project success, with consistent improvements in delivery timelines, budget adherence, and client satisfaction. The recommendation included further research to explore specific factors influencing the effectiveness of Agile practices in different project contexts.

Wang (2018) aimed to identify the critical success factors in Agile project management that contribute to project success in software development. Using a survey-based approach, data was gathered from Agile project teams across various software development organizations. The study identified effective communication, stakeholder engagement, and iterative development as key success factors in Agile project management linked to improved project outcomes. The recommendation was to focus on strengthening these critical success factors to maximize the impact of Agile methodologies on project success.

## METHODOLOGY

This study adopted a desk methodology. A desk study research design is commonly known as secondary data collection. This is basically collecting data from existing resources preferably because of its low cost advantage as compared to a field research. Our current study looked into

already published studies and reports as the data was easily accessed through online journals and libraries.

## RESULTS

**Conceptual Gap:** While the studies by Smith (2018) and Brown (2022) focused on the impact of specific Agile methodologies (Scrum and Kanban, respectively) on project success, there is a need for research that integrates multiple Agile methodologies. A study that compares and contrasts the effectiveness of various Agile frameworks, such as Scrum, Kanban, Extreme Programming (XP), and Lean Agile, could provide a more comprehensive understanding of how different Agile practices contribute to project success in software development.

**Contextual Gap:** The study by Wang (2018) identified critical success factors in Agile project management but did not delve into the contextual factors that influence the effectiveness of Agile methodologies. Research is needed to explore how contextual factors such as organizational culture, team size, industry type, and project complexity impact the implementation and outcomes of Agile practices. Understanding these contextual nuances can help tailor Agile methodologies to specific project environments, leading to improved project success.

**Geographical Gap:** Most of the reviewed studies by Lee (2023) focused on Agile methodologies' impact on project success within Western developed economies. There is a lack of research examining how Agile practices perform in different geographical contexts, particularly in emerging economies or regions with diverse cultural and business landscapes. Investigating the adoption, challenges, and outcomes of Agile methodologies in non-Western contexts can provide valuable insights into the global applicability of Agile practices and uncover potential cultural or regional barriers to Agile implementation.

## CONCLUSION AND RECOMMENDATIONS

### Conclusion

The Impact of Agile Methodologies on Project Success in Software Development is a multifaceted and dynamic area of research that continues to garner attention from scholars and practitioners alike. Through a review of empirical studies spanning the past few years, it is evident that Agile methodologies, such as Scrum, Kanban, and Extreme Programming, have a positive influence on project success metrics including timely delivery, budget adherence, and client satisfaction. The adoption of Agile practices is associated with improved efficiency, increased collaboration, and greater adaptability to changing project requirements, leading to enhanced project outcomes.

The studies highlighted various aspects of Agile methodologies' impact on project success, ranging from improved workflow management and reduced cycle times to better resource allocation and stakeholder engagement. Additionally, Agile practices fostered a culture of continuous improvement and customer-centricity, aligning project deliverables with client expectations and business value. The findings underscore the importance of Agile principles such as iterative development, frequent feedback incorporation, and cross-functional teamwork in driving project success in software development.

However, while the empirical evidence overwhelmingly supports the benefits of Agile methodologies, there are still research gaps to be addressed. These include the need for comprehensive comparisons between different Agile frameworks, a deeper exploration of contextual factors influencing Agile effectiveness, and investigations into Agile adoption and

outcomes in diverse geographical contexts. Addressing these gaps will contribute to a more nuanced understanding of how Agile methodologies contribute to project success and provide actionable insights for organizations seeking to maximize the benefits of Agile practices in software development. In conclusion, the collective body of research underscores the significant positive impact of Agile methodologies on project success in software development. By embracing Agile principles and practices, organizations can enhance their ability to deliver high-quality software products efficiently, adapt to evolving project needs, and ultimately achieve greater client satisfaction and business value.

**Recommendations**

The following are the recommendations based on theory, practice and policy:

**Theory**

To further enhance our theoretical understanding of the Impact of Agile Methodologies on Project Success in Software Development, it is recommended to conduct further comparative studies that delve into the nuanced differences between various Agile methodologies such as Scrum, Kanban, and Extreme Programming (XP). These studies can provide insights into which Agile practices are most effective in different project contexts, contributing to the development of comprehensive theoretical frameworks. Additionally, developing contextual frameworks that integrate organizational culture, project complexity, and team dynamics into Agile implementation models will enrich our understanding of how these contextual factors influence Agile methodologies' effectiveness. By advancing theoretical frameworks through comparative and contextual studies, we can refine our knowledge of Agile methodologies' impact on project success metrics.

**Practice**

In terms of practical recommendations, organizations should prioritize training and skill development initiatives to ensure teams are well-equipped to apply Agile methodologies effectively. This includes investing in comprehensive training programs, providing certification opportunities, and offering coaching and mentorship to support teams in adopting Agile practices. Emphasizing a culture of continuous improvement within Agile teams is also crucial, with regular retrospectives and feedback loops serving as valuable mechanisms for driving iterative improvements in project delivery and outcomes. By focusing on practical measures such as training and iterative improvement, organizations can enhance the application of Agile methodologies in software development projects.

**Policy**

From a policy perspective, it is essential to establish organizational support mechanisms for Agile adoption. This includes developing policies that allocate dedicated resources, budget, and leadership commitment to Agile initiatives. Organizations should ensure alignment between Agile practices and broader organizational goals and strategies to foster a conducive environment for Agile implementation. Furthermore, considering policy frameworks that address regulatory compliance and quality assurance within Agile methodologies is crucial. Establishing guidelines for documentation, testing standards, and risk management practices can help maintain project integrity while leveraging Agile flexibility. By implementing supportive policies that align with organizational goals and address regulatory considerations, organizations can facilitate successful Agile implementation in software development projects.

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