

# EFFECT OF AGILE MANAGEMENT PRACTICES ON PROJECT PERFORMANCE OF SMART APPLICATIONS LIMITED

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**Abstract:** Effective project management stands as a cornerstone for organizational growth, particularly in the healthcare sector where innovative practices are imperative for delivering high-quality services. Despite advancements, challenges persist, including technology project failures, inadequate research, and issues of transparency. Smart Applications Limited, a provider of ICT services, operates within this dynamic environment, facing pressures to adapt to disruptive digital technologies while ensuring project success. This study seeks to investigate the effect of agile management practices on project performance of Smart Applications Limited. Adopting a mixed-method research design, this study integrates quantitative and qualitative approaches to gain comprehensive insights into project management dynamics. The target population comprises 60 project managers within Smart Applications Limited, with data collected through questionnaires. Utilizing the census sampling technique ensures the inclusion of all managers from relevant departments. The study employs the multiple regression model to establish correlations between project management styles and performance indicators at Smart Applications Limited. By addressing these objectives, this research contributes to filling the existing gap in understanding success factors for project implementation in the healthcare sector. Through insights gained, Smart Applications Limited and similar organizations can enhance their project management strategies, fostering sustainable growth and resilience in an ever-evolving healthcare landscape

**Keywords:** Agile Management Practices, Project Value Monitoring Tool, Automated Project Team Coordination Techniques, Proactive Risk Management.

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## 1. INTRODUCTION

Effective project management is crucial for the sustainable growth of any organization. In the healthcare sector, innovative project management approaches have led to numerous benefits, such as increased access to medical care, improved service quality, and low medical errors. Adopting disruptive digital technologies such as automation has also freed project teams from routine tasks, allowing them to focus on more value-adding activities. However, research shows that the failure of technology projects is a universal problem affecting organizations in all sectors globally.

This problem is also prevalent in the healthcare industry, where seamless coordination and implementation of projects face significant threats. Despite adopting innovative approaches to project management, factors such as inadequate research, corruption, lack of transparency, and accountability continue to impact project outcomes. Smart App Limited provides ICT services to both government and private institutions.

As such, the company requires excellent project management strategies to increase its customer base and financial performance. Therefore, there is a need to investigate the factors impacting Smart App Limited's project success rates.

Understanding these factors will improve the company's project management strategies and ultimately enhance its performance.

Globally, innovation is changing the outcomes of virtually every type of project. According to the Project Management Institute (2018) disruptive digital technologies are adding value throughout the project lifecycle. The new technologies such as automation are freeing the project team members from their routine roles hence, they now have more time to devote to more value adding activities such as strategy formulation. As a result, more than 80% of the innovator organizations are recruiting project managers with skill sets that are needed to achieve consistent results in the midst of the digital environment (Project Management Institute, 2018). The organization surveyed 469 human resource professionals to determine the effects of innovative behavior in coping with the emerging disruptive technologies. The study results displayed in figure 1 below indicates that the vast majority of the project leaders believe that it is possible to excel in the current market without embracing the innovative approaches.

Most managers are already employing the technologies to navigate the challenging market environments. More than 70% of the respondents recognize the need to acquire new project management skills. This is because businesses have a wide variety of project management tools such as cloud solutions, Internet of Things, blockchain, artificial Intelligence, robotics, 3D printing and many others. Incorporating the innovations into the project management are enabling companies to achieve better results than in the past.

To improve the background section, we need to provide more context and detail on Smart App Limited and its operations and establish a connection between the company's operations and the need for agile project management practices. Smart App Limited is a technology company specializing in developing and implementing innovative solutions in the healthcare sector. The company operates in Kenya, a country facing various challenges in the healthcare sector, including an aging population, reduced funding, and rising inflation. These challenges make it difficult for healthcare providers to achieve expected returns on investment while still delivering high-quality services to their clients.

Smart App Limited recognizes the need for innovative project management styles to remain competitive in the dynamic global healthcare market. Traditional project management practices are needed to cope with the constant shifts and changes in consumer preferences and technology. The company believes agile project management practices can help it achieve efficiency, exceptional service deliveries, and cost and time savings.

Agile project management is a methodology that emphasizes flexibility, collaboration, and adaptability in project delivery. It enables project managers to respond quickly to changing requirements and to deliver projects in shorter iterations. Agile project management practices can also help companies reduce project failure risk by ensuring that teams remain focused on delivering value to the client.

For Smart App Limited, adopting agile project management practices is crucial for achieving sustainable growth and delivering seamless coordination of healthcare technologies. The company recognizes that implementing innovative projects through conventional project management methodologies can be challenging due to the complexities involved. Project managers are under increased pressure to deliver exceptional services with limited resources, and the costs of projects often exceed their budgets. The company also acknowledges the high failure rates of IT projects and the potential negative impact of poor risk management strategies. Smart App Limited operates in a challenging environment that requires innovative solutions and agile project management practices to remain competitive. The company recognizes the importance of adopting these practices to achieve its strategic objectives and deliver value to its clients.

In Kenya, the technologies have been applied to offer health training to healthcare providers in Dadaab Refugee Camp (Burkardt et al., 2019). Different actors including governments, community-based organizations, private sector and the civil societies often coordinate their efforts in times of crisis such as the ongoing corona virus pandemic. However, as Schonberger and Čirjevskiscites (2017), project implementation are characterized with external forces, unexpected events, conflicting demands by the stakeholders, changing constraints and fluctuating resource flows. The factors collectively affect the success of projects.

The stakeholders are, therefore, in need of better project management strategies. This project seeks to investigate the factors impacting on the success rates of Smart Applications International Limited. As a provider of ICT services to both the government and private institutions, excellence in project management would go a long way in increasing the company's customer base and financial performance.

Innovative project management styles are reshaping health and related sectors in unprecedented ways. Artificial intelligence and other digital tools are enabling to foresee challenges and turn opportunities into steady revenues (Raith et al., 2017). The application of data science helps in agility in decision making. For example, the managers move quickly in capitalizing on latest leading business practices to accomplish the project strategic goals (Biazo et al., 2020). The big data analytics and videoconferencing tools are being increasingly employed to launch better Scrum project management styles. This is a framework that encourages small project teams to source for ideas from multiple stakeholders (Hidalgo, 2019). The Scrum Master works in short cycles known as sprints and the team meet regularly to evaluate progress and improve performance.

Alternatively, firms can employ enterprise resource planning (ERP) system are enabling the health organizations to integrate planning, inventory management, sales, marketing and finance functions (Biazo et al., 2020). The innovations are compatible with waterfall project management methodologies which deliver the periodic goals in sequential phases.

As Thesing et al. (2021) found, the success of the framework increases whenever research is conducted upfront and estimations of the resources needed are accurate. The data driven decisions foster innovative mindset, seamless coordination in managing the projects and ability to surpass clients 'expectations. Consequently, the identified independent variables for the study will include agile project management styles, proactive risk management, and automation of project cycles and effective deployment of ERP systems to achieve desired goals.

Projects are regarded a success whenever every step of implementation is executed with high level of professionalism (Njeru & Luketero, 2015). In healthcare sector, this occurs whenever there is definition of objectives, comprehensive measures for ensuring that costs, time and quality meet or exceed the desired standards. Outcomes such as innovations, user friendliness, cost leadership, and high customers 'satisfaction levels often show the performance levels (Vrchota et al., 2021).

In other words, success means different things to different stakeholders. From the shareholders 'perspective success of a project is determined by the returns in investment, reduced costs, profitability, growth in market share or number of customers and many other financial gains. In contrast, consumers view project success in terms of sustainable solutions to a market challenge, efficiency and reliability in accessing services, decrease in prices and many others (Chou & Pramudawardhani, 2015). Given that Smart Applications Ltd serves stakeholders with diverse needs, the project success in this case will be defined by the performance standards. Any healthcare system that achieves or surpasses the targeted value creation and financial goals will be regarded as a success. Model proposed by Santos et al. (2020) will be adopted to help in the measure of success. The framework comprises four dimensions namely, project efficiency, impact on customers, direct business benefits and implications on future growth. Project efficiency dimension further entails completion time and resources incurred.

Smart Applications is an international healthcare solutions provider headquartered in Nairobi. The company was founded in 2011 to deliver a range of world class technological solutions across East African nations and beyond. It offers a number of services to the clients which includes mobile phone applications, healthcare software, automated medical scheme management solution, biometric identity management solution, Smart time and attendance solutions (Smart Applications, 2022). However, its most popular service includes the USSD & SMS app which allow the users to check their medical/insurance card balances using their mobile phones by dialing \*891#. The company is headquartered at International Life House but operates via Omni-channel platforms hence targets both the local and international customers. That is, besides the physical offices, the company serve its clients via the website, and all the social media platforms. However, this study concentrates on the firm 's strategies and procedures for increasing the success rates of Smart App Limited 's ongoing and future projects particularly the development of new digital healthcare technologies. Insurance companies and hospitals.

Smart Applications Limited is a leading ICT solutions provider that offers a wide range of world-class technological solutions, including biometric solutions, automated medical scheme management solutions, time and attendance solutions, canteen management solutions, and identity management solutions. The company is fondly known as "Smart" within the industry and was founded to provide innovative, secure, high-tech solutions in Africa and beyond.

The selection of Smart Applications Limited for this study is justified by the company's reputation as a leading provider of ICT solutions, particularly in biometric solutions. Biometric solutions are becoming increasingly important in various industries, including healthcare and finance, where security and identity management are critical. Smart Applications Limited has demonstrated its ability to deliver innovative and secure biometric solutions that meet the needs of its clients.

Furthermore, the company's commitment to constant research and innovation aligns with this study's objectives, which aim to explore the correlation between adopting innovative project management practices and project performance. Smart Applications Limited's experience delivering high-tech solutions in complex business environments such as health insurance technologies makes it a suitable candidate for this study.

Overall, the selection of Smart Applications Limited is justified by the company's reputation, experience, and expertise in delivering world-class ICT solutions, particularly in biometric solutions, as well as its commitment to constant research and innovation.

## 2. STATEMENT OF THE PROBLEM

The global health market is constantly changing and demanding innovative project management styles. Cloud solutions, AI, IoT, and other digital tools are displacing traditional project management processes. Entrepreneurship and changing consumer preferences also call for agility in responding to market changes. However, traditional project management practices pose significant threats to firms operating in highly competitive sectors such as healthcare.

Project managers need more resources to deliver exceptional services. Studies show that many IT projects fail, recording cost and schedule overruns. There is a research gap on the success factors for project implementation, and the existing studies' performance statistics need to be clarified for decision-makers.

The project managers need new knowledge of proactive risk management strategies to achieve sustainable growth. The innovative approaches for coping with the changes in the micro and macro-environment lead to high performance. However, there is a lack of knowledge on how innovative project implementation procedures affect the financial health of firms.

This study aims to explore Smart Applications Limited's experiences in managing the threats to the seamless coordination of healthcare technologies and the effects of innovative project implementation procedures on the firm's financial health, filling the research gap on the success factors for project implementation in the healthcare sector.

## 3. LITERATURE REVIEW

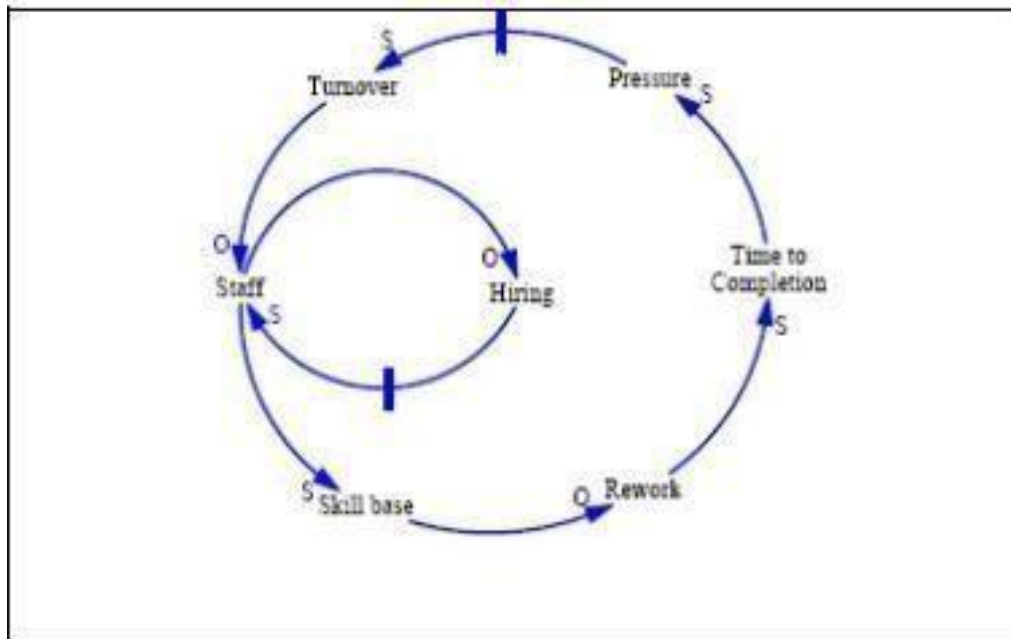
### Theoretical Literature Review

#### System Thinking Theory

This is a holistic approach focusing on how various components of a project interrelate, work and function to generate targeted outputs. The origin of the concept is traceable to the 1956 discovery by Professor Jay Forrester of the MIT Sloan School of Management (Hargreaves and Podems, 2012). Forrester demonstrated that computer simulations, graphs and diagrams can be leveraged to predict system behaviours in response to the fluctuations in various components. For example, the organizations are prone to competing demands from diverse consumer bases. Various units within the, firms therefore, often employ multiple tools to perform key functions such as scenario planning, value chain analysis and process engineering (Loosemore and Cheung, 2015).

However, studies have found that the tools hardly accomplish objectives since they are not holistic. Consequently, system thinking was introduced to enable continuous discovery and diagnosis of the threats to seamless coordination among the sub components. As Sankara et al. (2010) cite, project management has a longstanding relationship with systems approaches particularly the system engineering since mid1990s. The project-based working became more technologically advanced allowing the scientists and engineers to reach new heights in full filling their stakeholders 'needs. The causal loops and systems archetypes such as levels of thinking may foster adoption of mental models that supports use of agile management practices to increase the returns on investments from projects. In this case, the cause-effect relationship would be presented by the correlation between the innovative project management styles and the final output.

Other advantages of the model include systematic approach for transforming the possible challenges into competitive advantage (Loosemore and Cheung, 2015). This is because the model explores the connections between each input and the functioning of the entire system. As figure 2 below illustrates, the ineffective management of sub system such as human resources can result in serious challenges.

**Figure 1: System Thinking Approach to HRM**

Source: Sankara et al. (2010)

For example, the project leader may pressurize the staff to work for extra hours whenever the scheduled project completion time is coming to an end. The stress of overtime can in turn lead to burnout, as well as, resignation of a number of team members. The staff turnover further erodes the skill base which may lead to increased demands for rework (Sankara et al., 2010). Similar obstacles can be experienced whenever there are no techniques for monitoring the consumption of material and financial resources at different stages of the project. Consequently, use of technologies such as ERP and automated project team coordination tools can be employed to monitor the periodic performances of the projects in relation to the resource demands and performance metrics.

However, system thinking theory has few drawbacks. First, the approach is more effective in managing small projects like those that are currently being handled by Smart Applications. Limited but may not accurately reflect on the firm 's demand while handling complex projects (Nguyen et al., 2012). Secondly, systems thinking works best when the project team studies the causal relationship between the various variables over a long period of time. This means that the model is not preferable in solving crisis

### Empirical Literature Review

Agility is a popular management concept leveraged by decision makers to navigate through the challenging business times. According to Bergmann and Karwowski (2018), agile methodology is a project management technique comprising constant collaboration among stakeholders and continuous improvement at every stage. It comprises five essential attributes of agile processes includes flexibility, transparency, creativity, effective leadership, and continuous improvement. Bergmann and Karwowski (2018) conducted a systematic literature review on the relationship between agile project management (APM) and project success.

According to the research, the development of APM is still in early stages. However, the speculations are high that it will become the project management style of the 21st century. Consequently, there are need for more evidence on the positive impacts of APM on project performance. Similarly, Dybå et al. (2014) describes agile project management as a strategy relying more on informal collaborations, coordination and learning than upfront plans.

Ideally, agility eliminates the bureaucratic procedures that consume resources but do not necessarily add value to the project. Chapter 11 of a book by Dybå et al. (2014) titled Agile Project Management discusses APM as software development approach for improving the performance of software projects. The book presents case study of the benefits of the APM over the traditional project management approaches. The benefits include autonomous teams, redundancy, feedback and learning. For example, APM entails short cycles of iterative and incremental delivery of product features. In healthcare



sector, the facilitators can organize meetings to enable the team members to brainstorm over the best solutions to overcoming obstacles.

In Hidalgo's (2019) view, the fundamental idea behind APM is to create incremental value per project phase that is completed. Various agile project management styles such as Kanban, Crum, SAFe have been found to maximize returns but at lower costs. Hidalgo (2019) conducted a case study on the advantages of adapting scrum framework for agile project management in science at UK-Based Centre for the Evaluation of Complexity across the Nexus (CECAN). It was found that the framework is expanding from software development projects to other types of firms. The scrum approach fosters interdisciplinary collaboration thereby improving the quality of the final product. For example, the technology users relied on APM to visualize the workflows hence consistently met the project targets. However, the study did not explicitly cover how scrum and related APM innovations can be applied to the management of health projects.

Masood and Farooq (2017) which explored the advantages of agile project management (APT) over traditional approach found that the technique was ideal for ensuring financial stability in the midst of unstable environment. The systematic literature review found that the proactive actions save a firm from spending resources on initiatives that do not generate value. Changes in requirements are discovered in good time leading to low chances of wasted work. The project was also planned and executed in short cycles hence there is few instances of rework. However, Masood and Farooq (2017) used secondary data, therefore, did not present new information on how to deal with the challenges arising from adoption of APM.

Leido (2014) also showed that the opportunities to incorporate emerging trends such as digital technologies lead to low operational costs. The author published a book focusing on value and wastes in project management. The book presents multiple examples, illustrative graphics and interesting case studies on APM. However, Leido's (2014) book was published over 8 years ago hence does not cover the recent discoveries on agile project management styles. On the other hand, Leido's (2014) main arguments are in line with the findings of a study by Azanha et al. (2017) that explored the effectiveness of APT on the high-tech pharmaceutical companies in

Brazil. The researchers used exploratory qualitative research to determine the advantages of Scrum framework over the traditional means for undertaking ICT projects in the Brazilian pharmaceutical industry. Azanha et al. (2017) found that the APT tool led to 75% and 30% reduction in the new product development time and costs respectively as compared to the traditional method. On the other hand, the study concentrated mostly on the Scrum agile framework hence does not provide valuable information on all the aspects of APM. However, Several other researchers have demonstrated that APT are cheaper per unit of value delivered since the project managers enjoy higher level of effectiveness and can eliminate the non-value adding initiatives (Bergmann and Karwowski, 2018; Hidalgo, 2019).

Khisa and Mutuku (2023) conducted a study on the critical success factors influencing the performance of finished construction projects at the National Social Security Fund in Nairobi City County, Kenya. The research utilized a descriptive research design for data collection, analysis, presentation, and interpretation. The target group consisted of 512 stakeholders involved in six fully completed commercial and residential projects. A purposive sampling technique was employed to select 84 participants for the research. The study utilized semi-structured questionnaires to gather data, which was then analyzed using SPSS software, incorporating both descriptive and inferential statistics. The results indicated an R-square value of 0.282 and an R value of 0.531. Furthermore, the analysis of variance (ANOVA) yielded a significant result at  $p=0.001$ , with an F statistic of 9.961, suggesting that the model applied was suitable for the data. The findings also highlighted that client variations ( $p=0.05$ ), financial availability ( $p=0.047$ ), and construction disputes ( $p=0.001$ ) were statistically significant factors influencing the performance of NSSF construction projects. Overall, the study concluded that the critical success factors identified had a notable impact, either positively or negatively, on the performance of completed construction projects at NSSF.

#### 4. RESEARCH METHODOLOGY

Adopting a mixed-method research design, this study integrates quantitative and qualitative approaches to gain comprehensive insights into project management dynamics. The target population comprises 60 project managers within Smart Applications Limited, with data collected through questionnaires. Utilizing the census sampling technique ensures the inclusion of all managers from relevant departments. The study employs the multiple regression model to establish correlations between project management styles and performance indicators at Smart Applications Limited.

## 5. FINDINGS

The descriptive statistics results on agile management practices are presented in Table 1.

**Table 1: Agile Management Practices**

	Mean	Standard Deviation
Adopting agile management practices enabled Smart Application Ltd. to achieve significant cost savings	N=1.70	.50
Agile management practices have enabled the company to preserve scarce limited resources without necessarily affecting the quality of the outcome?	N=1.89	.57
Adoption of agile management practices places Smart Application Ltd. in a better position to minimize costs of undertaking projects, as well as, achieve desired profitability levels?	N=1.70	.60

For the first statement, "Adopting agile management practices enabled Smart Application Ltd. to achieve significant cost savings," the mean of 1.70 suggests that the respondents, on average, tend to agree that adopting agile practices led to significant cost savings. The standard deviation of 0.50 indicates that responses are relatively consistent around the mean, suggesting a relatively narrow range of opinions among respondents. This implies a high level of agreement among respondents regarding the cost-saving benefits of adopting agile practices.

Similarly, for the statement, "Agile management practices have enabled the company to preserve scarce limited resources without necessarily affecting the quality of the outcome," the mean of 1.89 suggests a stronger agreement among respondents compared to the first statement. The standard deviation of 0.57 indicates a slightly higher variability in responses compared to the first statement, but still within a relatively narrow range. This implies that while there is a high level of agreement regarding the preservation of resources through agile practices, there may be slightly more variability in opinions among respondents compared to the first statement.

Lastly, for the statement, "Adoption of agile management practices places Smart Application Ltd. in a better position to minimize costs of undertaking projects, as well as, achieve desired profitability levels," the mean of 1.70 aligns with the first statement, indicating a high level of agreement among respondents regarding the benefits of agile practices for cost minimization and profitability. The standard deviation of 0.60 suggests slightly more variability in responses compared to the first statement, indicating a wider range of opinions among respondents. This implies that while there is still overall agreement regarding the benefits of agile practices for cost minimization and profitability, there may be some divergence in opinions among respondents regarding the extent of these benefit.

### Inferential Statistics Results

**Table 2: Correlation Analysis**

	Project Performance	Agile management practices
Project Performance	1	0.265** .000
Agile management practices	54	54

Agile management practices demonstrates a positive correlation of 0.265 with "Project Performance." This signifies that as organizations adopt more Agile Management Practices, there tends to be an improvement in project performance. Importantly, this correlation is statistically significant at the 0.00 level, underscoring the reliability of this relationship, albeit with a moderate strength.

### Regression Analysis Results

**Table 3: Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.637 <sup>a</sup>	.406	.357	.36397

Table 3 indicates that independent variables controls affect project performance of Smart Applications Limited. This is evident, as shown by the R square value which 0.406. This implies that 40.6% of organizational performance of Smart Applications Ltd can be explained by agile management practices whereas 59.4% can be explained by other variables which are not included in this model.

**Table 4: Analysis of Variance**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.433	1	4.433	35.464	.000 <sup>b</sup>
	Residual	6.491	52	.125		
	Total	10.924	53			

In the ANOVA table, the F-statistic for the Regression component is 35.464, and the associated significance (Sig.) is reported as 0.000 (noted as .000b), which is well below the conventional significance level of 0.05.

This outcome indicates that the variation explained by the agile management practices is statistically significant. In other words, these predictors collectively contribute significantly to explaining the variation in "Project Performance."

In summary, based on the ANOVA table, the model appears to be a good fit for explaining the variation in "Project Performance." The statistically significant F-statistic suggests that the predictors are collectively meaningful in understanding and predicting project performance. However, it's important to note that the model's overall effectiveness should be considered alongside other factors, and further analysis may be needed to assess its practical utility and predictive accuracy.

**Table 5: Coefficients**

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.457	.305		1.501	.031
	Agile Management Practices	-.082	.168	-.077	-.487	.019

The constant term, represented by the coefficient of 0.457, signifies the baseline or expected value of "Project Performance" when all independent variables are zero. In other words, it represents the project performance level in the absence of any influence from the predictors. The associated t-statistic of 1.501 and significance (Sig. .031) indicate that the constant is statistically significant. This suggests that even without any predictor variables, there is a meaningful baseline level of project performance. The results align with the research conducted by Rahmatika (2014), Makori (2016), and Barasa (2015).

The coefficient for "Agile Management Practices" is -0.082, implying that a one-unit increase in Agile Management Practices leads to a decrease of 0.082 units in "Project Performance." The standardized coefficient (Beta) of -0.077 indicates that this predictor has a relatively small negative impact on project performance. The associated t-statistic of -0.487 and significance (Sig. .019) suggest that while Agile Management Practices do have a statistically significant effect, the impact is modest, contributing to a slight reduction in project performance. These findings are thus, not in agreement with Asaolu (2016) and Wanyama (2018).

## 6. CONCLUSIONS

Concerning Agile Management Practices, it was found that while statistically significant, these practices had a relatively modest adverse impact on "Project Performance." Specifically, a one-unit increase in Agile practices corresponded to a slight decrease in project performance. These findings contrast with prior research by Asaolu (2016) and Wanyama (2018), suggesting that the benefits of Agile practices may not always translate into improved project outcomes.

## 7. RECOMMENDATIONS

Balancing agile practices is another key consideration. While the study revealed a modest adverse impact of Agile Management Practices on project performance, it's important to recognize that Agile methodologies offer significant benefits in terms of adaptability and responsiveness. The recommendation here is to strike a balance. Smart Applications Ltd should evaluate specific project requirements and consider whether agile practices are best suited for certain projects while maintaining a more traditional project management approach for others. Flexibility in methodology selection can optimize project outcomes.



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