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EFFECT OF AGILE PROJECT MANAGEMENT ON PERFORMANCE OF MINING PROJECTS IN RWANDA: A CASE OF ITSCI PROJECT

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ABSTRACT

The goal of this research was to find out how agile project management affects the productivity of mining projects in Rwanda. The study's objectives are to determine the effect of adaptive planning on performance of mining projects in Rwanda, to establish the effect of continuous improvement on performance of mining projects in Rwanda, to assess the effect of iterative project management on performance of mining projects in Rwanda and to examine the effect of Stakeholders collaboration on performance of mining projects in Rwanda. A descriptive survey method was used for this study. Three hundred and eighty-eight respondents with experience in project management made up the study's primary emphasis. A sample size of 197 respondents was determined using Slovin's formula Secondary information was gathered for this study from records kept by the International Supply chain Initiative Project in Rwanda. In addition, questionnaires were sent to gather primary data. Respondents' experiences and insights formed the basis for the study's analysis and interpretations. Different approaches and incentives were used in the surveys, interviews, and observations with the participants. Participants were asked to critically evaluate the instruments' face-to-face and content validity for the researcher. To assure reliability the study used a test-retest strategy. Reliability was calculated using the Cronbach's coefficient. Reliability of the tool was a test value of 0.7 or above. Concurrent triangulation was used to increase the reliability of the study's findings. The data was collected through the use of a structured questionnaire, and subsequent analysis made use of descriptive statistics. Inferential analysis and Pearson's correlation analysis was used to assess the degree of association between the two sets of variables. A thorough interview approach was used to determine the validity of non-numerical instruments. The study used SPSS tool version 25 to analyze the data. Descriptive and inferential statistical tests was used to analyze quantitative data, and tables and figures were used to display the results. Percentages, rates, and counts are under the purview of descriptive statistical tests, while multiple regression is used in inferential statistical analyses. The results of this thematic analysis of qualitative data were presented in narrative style with direct quotations from the sources used to support them. The results indicates that the constant term is 1.203, with a significant t-value of 8.248 ($p < 0.001$), suggesting a robust baseline performance. Among the predictors, adaptive planning shows a positive and significant relationship with

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project performance (B = 0.258, β = 0.368, t = 7.871, p < 0.001), highlighting its crucial role in enhancing outcomes. Conversely, continuous improvement exhibits a negative impact on performance (B = -0.179, β = -0.250, t = -4.199, p < 0.001), indicating potential misalignment or ineffective implementation within the context. Iterative methods also contribute positively to performance (B = 0.171, β = 0.207, t = 2.938, p = 0.004), affirming their utility in adaptive project management. Notably, close collaboration emerges as the most influential variable, with the highest standardized coefficient (B = 0.483, β = 0.578, t = 10.400, p < 0.001), underscoring its significance in driving project success in the mining sector. In conclusion, the findings highlight the significant role of adaptive planning, iterative methods, and close collaboration in driving project performance within the mining sector, while continuous improvement may require strategic reassessment to mitigate its negative impact. Based on these results, it is recommended that mining firms emphasize collaborative practices and flexible planning frameworks to enhance project outcomes, while carefully evaluating and refining continuous improvement initiatives to ensure alignment with project goals. Future studies could explore the underlying causes of the negative effects of continuous improvement in this context and investigate how these strategies might be better adapted to dynamic, resource-intensive industries.

Keywords: *Agile Project Management, Mining Projects, Project Performance, iTSCi Project, Rwanda Mining Sector.*

BACKGROUND OF THE STUDY

The mining business holds significant importance in driving economic development on a global scale. According to Purnama and Subroto (2019), this phenomenon has a substantial role in the overall Gross Domestic Product (GDP) and serves as a significant source of employment possibilities. In the past few years, there has been a notable evolution in project management methods within the mining industry, with a growing focus on the implementation of agile methodologies (Cândido & Santos, 2021). The implementation of Agile Project Management (APM) within mining projects is driven by prevailing worldwide trends in project management as well as the imperative for enhanced project performance and efficiency.

The Agile methodology is well-suited for intricate projects characterized by a high level of complexity, wherein the pre-determination of the product is challenging. The iterative process of testing and refining a prototype is commonly employed in the software business to ascertain consumer requirements. According to Munns and Bjeirmi (2021), the effective implementation of a project is typically determined by its adherence to the predetermined schedule and budget, as well as the attainment of the majority of its initial objectives. Additionally, the project's acceptance and utilization by its intended clients are also key factors in evaluating its success.

The Agile technique, which was initially formulated within the software development field, places significant emphasis on the principles of adaptability, cooperation, and adaptiveness to evolving circumstances. Schlichter et al. (2019) have emphasized the broad applicability of this concept, extending its relevance from software development to several industries, including construction. There is a growing recognition on a global scale that conventional methods of construction project management may not be the most effective approach for the increasingly dynamic and intricate projects of the present era. The Agile principles, as outlined by Tzortzopoulos et al. (2019), are perceived as a flexible approach aimed at improving project performance through the facilitation of iterative planning, real-time communication, and expedited decision-making.

In accordance with Ofori-Kuragu and Frimpong (2019) the yardstick for project success lies in its ability to effectively balance the three key components of the triple constraint: performance, cost, and time. Every organization is driven by specific strategic objectives, which are entrusted to the management for devising the necessary strategies to attain them (Kozan & Ulubeyli, 2019). Once these strategies and visions are formulated, management proceeds to create individual projects or programs aimed at bringing these strategic

goals to fruition. This alignment between strategy and project execution is underscored by Ahmed, Khandoker and Ali (2019) who emphasize that organizational projects are pivotal entities that must be meticulously organized to yield discernible advancements in the business. If executed proficiently, these projects can significantly augment the organization's overall value.

Nevertheless, as Amason (2021) astutely points out, companies operate under finite resource constraints, which necessitate a judicious selection of projects. The successful completion of these projects enhances the probability of realizing organizational goals. Consequently, any initiative aimed at enhancing the success rates of projects, whether before, during, or after their implementation, warrants wholehearted support from all stakeholders within the organization (Williams & Mohamed, 2020).

Scrum is the predominant agile framework utilized for project management in China (Wu & Zhang, 2020). The text proposes three distinct roles within a team that is tasked with completing multiple iterations within a predetermined timeframe, typically ranging from two weeks to one month (Li & Yang, 2019). These roles include the product owner, who serves as the representative of the stakeholders and advocates for the interests of the customers; the development team, which bears the responsibility of delivering functional product increments at the conclusion of each sprint; and the scrum master, who does not assume a leadership position within the team but is accountable for ensuring adherence to the Scrum framework (Shen & Li, 2020). The implementation of Scrum has resulted in enhanced project performance in China due to its emphasis on self-organization within the framework. This entails that the Scrum team is accountable for both the scheduling and completion of the job.

By 2019, South Africa allocated nearly 13% of its national budget to infrastructure development, as noted by Akinsola and Oyedele (2019). However, the civil engineering sector has been grappling with persistent issues of cost overruns and project delays, as highlighted by Odeh and Battaineh, (2019). These challenges are particularly concerning given the substantial investments made in this industry. To address these concerns, it is imperative to enhance the performance of civil engineering projects. To optimize project outcomes, there is a need to place greater emphasis on the design process (Kasimu & Ogunlana, 2019). Agile methodologies, which prioritize collaboration among stakeholders, client satisfaction, and the quality of the final product, hold significant potential for enhancing efficiency during the design phase of mining projects. By implementing agile principles in this crucial stage, we can foster improvements that ultimately lead to more successful project deliveries.

In recent years, agile methodologies have emerged as a promising solution to combat the persistently high project failure rates (Ribeiro & Lopes, 2019). However, as the need for more adaptability in project management became evident, the concept of Agile Project Management arose. This innovative project management approach is specifically designed to thrive in dynamic and demanding environments characterized by constant change, rendering traditional prescriptive and standardized processes obsolete (Serrador & Pinto, 2021); Leite & Anbari, 2019). The mining industry has been experiencing substantial growth due to increased infrastructure development and urbanization (Adeyemi & Ogunlana, 2019). However, challenges related to project delays, cost overruns, and quality issues persist. Embracing Agile project management practices could offer solutions to address these challenges, as seen in other African countries like South Africa (Ahiaga-Dagbui & Smith, 2019).

Uganda faces significant disparities in technological progress, including limited access to affordable computing equipment and inadequate infrastructure, such as unreliable power supply and expensive internet connectivity (Hassan, Holburn & Williamson, 2019). As a result, the progress of software development and its timely delivery are significantly impeded, leading many IT organizations to resort to conventional approaches like the waterfall method (Balikuddembe, Nalwadda & Namagembe, 2019). These methodologies tend to discourage the practice of teamwork, as the development process follows a linear trajectory that allows limited opportunities for improvement or consultation, primarily due to the infrequent changes in requirements

(Kiggundu, Nakibuuka & Ssembatya, 2020). Nevertheless, the aforementioned issues are being effectively tackled through comprehensive training programs that focus on the enhancement of technical competencies, effective communication and customer engagement abilities, as well as fostering a culture of teamwork and collaboration (Kakooza & Kimuli, 2019). However, challenges and limitations should also be considered. The applicability of agile principles in the Ugandan construction sector may face resistance due to traditional project management practices (Ntambi *et al.*, 2021). Additionally, agile may require a shift in the skills and mindset of construction professionals, necessitating training and education (Kaggwa & Lwakuba, 2019).

In recent times, there has been a growing recognition in Kenya regarding the efficacy of agile approaches in tackling the prevalent issue of project failures. The emergence of Agile Project Management can be attributed to the need for a novel project management framework that can adeptly navigate complex and dynamic environments defined by rapid changes (Oluwoye, 2019). This approach recognizes that the conventional inflexible and standardized procedures are no longer appropriate in certain contexts (Chin, 2021; Highsmith, 2022). The origins of agile project management may be attributed to the domain of system development, and it has undergone evolutionary growth through empirical breakthroughs. Nevertheless, it is important to acknowledge that the utilization of this methodology is not limited exclusively to the previously indicated sector. The e-commerce sector in the Kenyan market has witnessed substantial growth in providing retail platforms for consumers (Michael, 2019).

Rwanda has been actively investing in its infrastructure development as part of its Vision 2020 and Vision 2050 initiatives (World Bank, 2019). Nonetheless, there is a growing need to improve project performance and minimize delays in mining projects in Rwanda (Gasana, Rwigema, Tindiwensi & Uwamahoro, 2019). Despite its potential benefits, implementing agile project management in mining projects can pose challenges. These challenges include resistance to change, cultural barriers, and the need for specialized training (Alinaitwe, Mwakali & Ahmed, 2019). Rwanda's construction sector has been experiencing rapid growth due to infrastructure development and urbanization efforts (Munyurangabo, Mugisha & Habimana, 2019). However, it faces challenges related to project delays, cost overruns, and quality issues (Ndihokubwayo, Mutabazi & Twagirimana, 2019).

The study on the effect of Agile project management on the performance of mining projects in Rwanda, specifically focusing on the ITSCI Project, is situated within the broader context of Rwanda's mining industry and the adoption of innovative project management approaches. Agile methodologies, originally developed for software development but increasingly applied across diverse sectors, offer promises of adaptability, collaboration, and iterative development, which could potentially address the dynamic challenges faced by mining projects in Rwanda. Research by (Serrador & Pinto, 2021) has indicated the efficacy of Agile practices in enhancing project outcomes, while (Jiang & Xue, 2019) have emphasized the need for flexible project management approaches in the mining sector. However, the application of Agile methodologies in the Rwandan mining context, particularly within the ITSCI Project, remains underexplored. Therefore, this study aims to fill this gap by assessing the impact of Agile project management on the performance of the ITSCI Project in Rwanda, contributing to both theoretical knowledge and practical insights into project management best practices within the Rwandan mining industry.

Statement of the Research Problem

Mining projects in Rwanda face numerous challenges that impede their performance, including frequent delays, cost overruns, and inefficiencies in project execution. Traditional project management methodologies often struggle to cope with the dynamic and unpredictable nature of mining activities, leading to suboptimal outcomes (Mugyenyi, 2020). As the Rwandan mining sector continues to grow and play a crucial role in the national economy, there is an increasing need for more effective project management approaches that can enhance performance, reduce risks, and improve stakeholder satisfaction (Rwanda Mines, Petroleum and Gas Board, 2022). The introduction of Agile project management, known for its iterative processes, flexibility, and

emphasis on collaboration, presents a potential solution to these challenges. However, the extent to which Agile methodologies can be effectively integrated and yield positive results in the context of Rwandan mining projects remains underexplored.

The lack of empirical evidence on the impact of Agile project management in the mining sector in Rwanda highlights a significant gap in the literature. Current studies have predominantly focused on the application of Agile in software development and other technology-driven industries (Dingsøyr *et al.,* 2012; Serrador & Pinto, 2021, Muller *et al.,* 2020). There is a pressing need to investigate whether the principles of Agile can be adapted to suit the unique demands of mining projects, which are characterized by high uncertainty and complex stakeholder environments (Adeleke *et al.,* 2018; Jiang *et al.,* 2020). Addressing this gap is critical for providing actionable insights that can help project managers and policymakers in Rwanda optimize mining project performance, thereby contributing to the sustainable development of the sector and the overall economy.

Moreover, the ITSCI project specifically focuses on responsible sourcing of minerals, aiming to address challenges such as conflict minerals and child labor in the mining supply chain. However, research suggests that Agile methodologies may not inherently address all aspects of sustainability and ethical considerations in project management (Heaslip & Zou, 2018). While Agile's emphasis on adaptability and stakeholder engagement is conducive to addressing some sustainability concerns, there remains a gap in integrating rigorous ethical frameworks and sustainability principles into Agile practices. Therefore, despite the potential benefits of Agile in enhancing project flexibility and stakeholder collaboration, there is a need for further research and development of tailored Agile frameworks that explicitly address sustainability challenges in mining projects like ITSCI (Hosseini et al., 2020). Closing these gaps is crucial to ensure that Agile methodologies effectively contribute to the sustainable development goals of mining projects in Rwanda.

Objectives of the Study

General and specific objectives of the study are provided in this section.

General Objective

The purpose of this study was to investigate the effect of agile project management on performance of mining projects in Rwanda.

Specific Objectives

- To determine the effect of adaptive planning on performance of mining projects in Rwanda.
- To establish the effect of continuous improvement on performance of mining projects in Rwanda.
- To assess the effect of iterative project management on performance of mining projects in Rwanda.
- To examine the effect of Stakeholders collaboration on performance of mining projects in Rwanda.

Conceptual Framework

A conceptual framework is a collection of concepts that are used to organize and shape the research process (Mugenda & Mugenda, 2021). It is a directing instrument that researchers use to guide their inquiry, and it encompasses a collection of ideas that researchers use to direct their investigation. The conceptual framework of this study elucidates the interrelationships among the variables that are the focus of the analysis. These variables include Stakeholders collaboration, continuous improvement, iterative techniques, and agile planning. These interrelationships are illustrated in Figure 1.

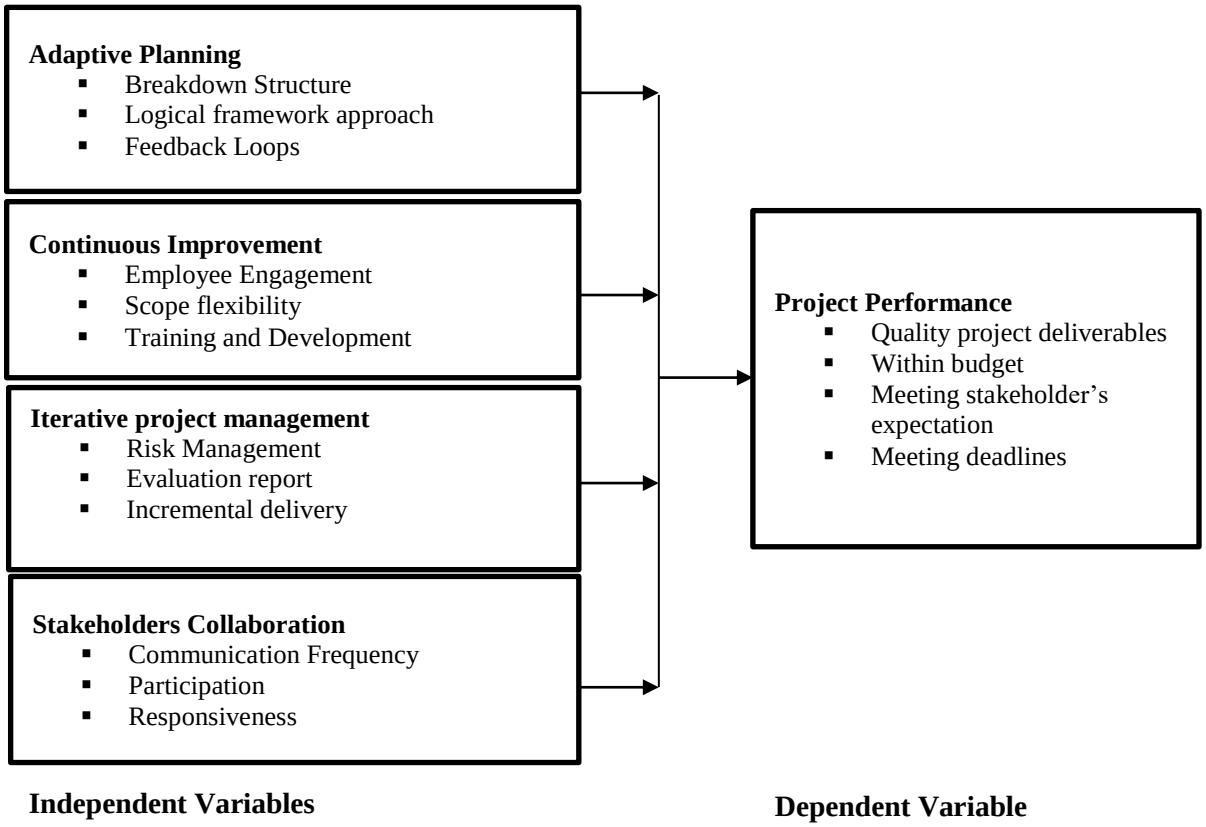

Figure 1: Conceptual Framework

The conceptual framework for this study is grounded in the fundamental principles of agile project management and its impact on the performance of mining projects in Rwanda. To determine the effect of adaptive planning on project performance, this research draws on the works of Highsmith (2022) and Beck and Beedle (2021), who emphasize the importance of adaptive planning and iterative development processes in agile methodologies. To establish the effect of continuous improvement, the framework incorporates insights from Schwaber and Sutherland (2019), who underscore the iterative and incremental nature of agile practices that facilitate ongoing improvements. To assess the effect of iterative project management, the study refers to the research of Leffingwell (2020) and Ambler (2022), who advocate for iterative development and its impact on project performance. Finally, to examine the effect of Stakeholders collaboration, the framework integrates findings from Cockburn (2022) and Schwaber (2022), highlighting the significance of collaborative teamwork in agile project management. These references form the theoretical underpinning of the study, guiding the investigation into how these agile principles affect the performance of mining projects in Rwanda.

Research Gaps

Despite the growing adoption of Agile Project Management (APM) in various industries, its application in the mining sector, specifically in the context of projects like ITSCI, remains underexplored. While APM has been well-documented in software development and some industrial contexts, there is a lack of comprehensive studies focusing on its impact in mining projects (Hoda *et al.*, 2020; Highsmith, 2022). Current literature primarily addresses Agile methodologies in software and general project management but does not extensively cover their implementation and outcomes in the mining industry (Dingsøyr *et al.*, 2022; Boehm & Turner, 2022). This gap highlights a need for empirical research into how Agile practices influence key performance indicators in mining projects, such as operational efficiency, cost management, and safety (Cervone, 2016; Pich *et al.*, 2022).

Another significant gap in the literature is the limited understanding of how Agile practices are adapted and implemented in the mining sector, particularly in projects like ITSCI. While Agile methodologies emphasize flexibility and iterative development, mining projects have unique constraints, including geological unpredictability and regulatory requirements, which may affect the adaptability of these practices (Schwaber & Sutherland, 2020; Rigby et al., 2016). Research on how these constraints interact with Agile principles is scarce, necessitating studies that explore how mining projects can effectively integrate Agile methodologies while addressing industry-specific challenges (Moe et al., 2012; Sutherland, 2014). Understanding these adaptations can provide valuable insights into the feasibility and effectiveness of Agile in such contexts.

Finally, there is a lack of longitudinal studies assessing the long-term impacts of Agile Project Management on mining projects. Most existing research provides snapshots of Agile implementations without considering the sustainability and long-term benefits or drawbacks of these practices in mining environments (Dybå & Dingsøyr, 2018; Conforto et al., 2016). Long-term studies are crucial to understanding how Agile methodologies influence project performance over time, including aspects like continuous improvement, stakeholder satisfaction, and project sustainability (Garel, 2018; Leach, 2019). Addressing this gap can help establish a more comprehensive understanding of the benefits and limitations of Agile practices in the mining industry.

METHODOLOGY

Research Design

Creswell (2022) posits that research design refers to the comprehensive framework that directs the execution of a research investigation. The framework presented below delineates the methodologies, methodologies, and methodologies employed by scholars to acquire and scrutinize data, with the ultimate objective of settling their research inquiries or hypotheses. The establishment of a research design is of paramount importance in ensuring the precise attainment of a study's goals, thereby yielding findings that are both valid and reliable. The study employed a descriptive correlational design, integrating qualitative and quantitative research tools. The researcher employed a comprehensive overview to primarily focus on presenting statistical insights pertaining to the areas of control within their scope of study.

Target Population

The specific population from whom a researcher aims to obtain findings is referred to as the targeted population (Kothari & Gaurav, 2022). Depending on direct relation with their agile project management related activity the researcher purposely selected certain departments those have the target population of 388 employees at ITSCI Project based within Kigali.

Sampling Procedures and Techniques

Sample Size

The study employed Slovin's technique, as described by Bryman (2019) and originally introduced by Slovin in 1967, to determine a sample size of 197 participants from a target population of 388 individuals. The method described above offers a framework for selecting the optimal sample size by considering the unique characteristics of the population being investigated.

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

Where n = the sample size.

e = probability of error, i.e., the desired precision, 0.05 for 95% confidence

$$n = \frac{388}{1 + 388(0.05)^2} = 197$$

Table 1: Sampling Size

Area of operation	Population	Sample
Architects	39	19
Surveyors	58	29
Mechanical Engineers	78	40
Electrical Engineers	58	29
Civil Engineers	97	50
Construction project managers	58	29
Total	**388**	**197**

Source: Human Resource Department – ITSCI Project, (2023)

Sampling Technique

The participants for this research were chosen using a stratified random sampling technique, with a particular focus on persons occupying different significant positions within the organization. The use of stratified random sampling is purposeful, as it facilitates a thorough and fair representation of the extensive study region, guaranteeing a varied array of viewpoints during the process of data collecting. This methodology is specifically well-suited for this research endeavor due to the fact that the individuals residing within this geographical region are subject to comparable socio-legal dynamics. As a result, this methodology guarantees the inclusion of any member of the intended population in the survey, as recommended by Creswell (2022).

Data Collection Methods

Primary Data Collection Method

Primary data is the information gathered from the respondents directly. Primary data was collected using questionnaires. A questionnaire refers to a collection of items to which a respondent is expected to react. Questionnaires are easy to design, distribute and collect the required data. They also eliminate the interaction of interviews with the respondents and reduce bias. Questionnaires were self-administered. The questionnaires were five knowledge scale with close ended questions to collect information from the respondents. The study adopted drop and pick methods where the instruments were dropped and collected after having been completed by the respondents. Frequent follow up was done to overcome the chances when the respondents forgot to fill in the questionnaires. Questionnaires are convenient to administer to a large number of respondents. The questionnaires addressed the effect of agile project management on performance of mining projects in Rwanda. The knowledge scale covered four areas Adaptive planning, Continuous improvement, Iterative project management, Stakeholders collaboration.

Secondary Data Collection Method

Secondary data involves gathering data already collected by someone else. Multiple sources were used to collect secondary data. Published books in the field of project management, published journals that provided the required literature in this study. Government reports and other project reports published that play an essential effect of agile project management on performance of mining projects in Rwanda was used in the study.

Pilot Test

A preliminary test was done on the data collection tools and procedures to identify likely problems. This test was conducted at LUNA SMELTER, whereby 20 questionnaires were administered to the employees in the respective departments. The filled questionnaires were later checked for consistency. Pilot study was a prerequisite for conducting validity and reliability of the research instruments

Validity of The Instrument

The concept of validity holds significant importance in evaluating the efficacy of an instrument in accurately measuring its intended construct and generating consistent results over multiple trials, as emphasized by Drost

in their 2019 study. DeVellis (2019) posits that the concept of examination validity encompasses the extent to which a given assessment accurately captures and measures the desired construct. Kothari (2022) asserts that validity, in the context of research, refers to the extent to which the conclusions derived from study findings are accurate and significant. The researcher enlisted the expertise of professionals and educators to examine the instruments and provide feedback in order to confirm their validity.

Table 2: KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.750
Bartlett's Test of Sphericity	Approx. Chi-Square	680.940
	df	10
	Sig.	.000

Source: **Pilot data results**, (2024)

Table 2 presents the results of the Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Test of Sphericity, both of which assess the suitability of the data for factor analysis. The KMO value is 0.750, which exceeds the minimum threshold of 0.6, indicating that the sample size is adequate for the factor analysis (Hair et al., 2022). This suggests that the data variables have enough in common to warrant a meaningful factor analysis. Bartlett's Test of Sphericity shows a significant result with a chi-square value of 680.940, degrees of freedom (df) = 10, and a significance level (p-value) of 0.000, indicating that the correlations between variables are sufficiently large for factor analysis to proceed (Tabachnick & Fidell, 2021).

Reliability of The Instrument

The concept of reliability was employed to underscore the extent to which empirical indicators exhibit stability and consistency. The study utilized a test-retest methodology, with a two-week interval between assessments and the inclusion of the same participants in both exams. The inclusion of a two-week timeframe also served to guarantee the provision of dependable responses, since it allows participants ample time between exams. The reliability of the tools was assessed using Cronbach's Coefficient Alpha. If the achieved alpha value is equal to or more than 0.7, the tools was considered dependable and deemed significantly acceptable. Additionally, the establishment of content dependability for research instruments was conducted during the piloting phase. This process aims to guarantee that the tools accurately measure the intended variables, hence enhancing the overall degree of consistency in the study (Mugenda & Mugenda, 2019).

Table 3: Reliability Statistics

Variable	Alpha (α)	Comments
Adaptive Planning	0.924	Reliable
Continuous Improvement	0.883	Reliable
Iterative project management	0.926	Reliable
Stakeholders' collaboration	0.829	Reliable
Performance of projects	0.894	Reliable

Source: **Pilot Results**, (2024).

Table 3 presents the results of the reliability analysis, using Cronbach's alpha (α), which measures the internal consistency of the variables in the study. The findings indicate high reliability across all variables, with values exceeding the commonly accepted threshold of 0.7, suggesting that the constructs used are dependable for the research context (Field, 2020). Specifically, adaptive planning (α = 0.924), continuous improvement (α = 0.883), iterative project management (α = 0.926), stakeholders' collaboration (α = 0.829), and performance of projects (α = 0.894) all demonstrate strong internal consistency, meaning that the items used to measure these variables are consistently reliable across different samples (Tavakol & Dennick, 2021). These results affirm

the robustness of the measurement tools used in this study, ensuring that the data collected are reliable for further analysis (Hair *et al.*, 2022).

Data processing Analysis

The examination of both qualitative and quantitative data was carried out autonomously via a triangulation methodology. The primary aim of the researcher was to obtain separate yet complementary data, which afterwards was integrated after the study. The data underwent encoding and structuring to enhance the organization of responses into distinct groups, applying Statistical Package for Social Science (SPSS) version 25. The research employed quantitative methodologies to examine numerical data, employing descriptive techniques such as frequency distribution and percentage calculations. In addition, the application of inferential statistics, particularly multiple regressions, was utilized to provide a thorough study. Oso and Onen (2019) argue that the importance of these individual insights' rests in their capacity to effectively depict essential attributes of the data employed in a study, by offering succinct descriptions of the sample and the methodologies employed. Additionally, statistical techniques such as Pearson correlation and regression was utilized for inferential analysis. The utilization of the Pearson correlation coefficient was employed to illustrate the association between the independent and dependent variables in terms of both magnitude and direction.

Quantitative data was presented in tabular and diagrammatic formats, while explanatory details were provided through written exposition. In a similar vein, the researcher utilized linear regression analysis in order to ascertain the strength and reliability of the association between the dependent and independent variables. The regression equation was formulated in the following manner.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Where: Y = Performance of mining projects; X1 = Adaptive planning; X2 = Continuous improvement; X3 = Iterative project management and X4 =Stakeholders collaboration. β i; i=1,2,3,4,} = The coefficients for the various independent variables, ε =Error term

Correlation and regression analyses are essential statistical tools used to explore relationships between variables and make predictions. Correlation measures the strength and direction of the linear relationship between two variables, providing insight into how changes in one variable might relate to changes in another (Schober *et al.*, 2018). Regression, on the other hand, goes a step further by modeling the relationship between a dependent variable and one or more independent variables, allowing researchers to predict outcomes and understand the impact of each predictor (Field, 2018). In project management research, these techniques are particularly useful for identifying factors that influence performance metrics, such as cost, time, and quality (Frost, 2021). Correlation is often used to assess the association between variables, while regression helps quantify the strength of these relationships and make predictions based on them (Hair *et al.*, 2019). Both techniques are critical for decision-making in business and research, as they provide a robust framework for testing hypotheses and developing actionable insights (Cohen *et al.*, 2018).

RESULTS AND FINDINGS

Correlation Analysis

Correlation analysis examines the relationship between key variables in the study, highlighting how different aspects of Agile Project Management influence the performance of mining projects. Table 4 presents the correlation coefficients between adaptive planning, continuous improvement, iterative project management, stakeholders' collaboration, and the performance of mining projects. Each variable's correlation strength indicates the degree to which changes in these Agile practices are associated with variations in project performance. The coefficient of determination further quantifies how much of the variance in mining project performance can be explained by these Agile management factors.

Table 4: Correlation and the coefficient of determination

		Performance of Mining projects	Adaptive planning	Continuous improvement	Iterative methods	Close collaboration
Performance of Mining projects	Pearson Correlation	1				
	Sig. (2-tailed)					
	N	182				
Adaptive planning	Pearson Correlation	.754**	1			
	Sig. (2-tailed)	.000				
	N	182	182			
Continuous improvement	Pearson Correlation	.385**	.383**	1		
	Sig. (2-tailed)	.000	.000			
	N	182	182	182		
Iterative methods	Pearson Correlation	.613**	.539**	.803**	1	
	Sig. (2-tailed)	.000	.000	.000		
	N	182	182	182	182	
Close collaboration	Pearson Correlation	.818**	.641**	.568**	.709**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	182	182	182	182	182

**. Correlation is significant at the 0.01 level (2-tailed).

Source: **Primary data, (2024).**

Table 4 presents the Pearson correlation coefficients and significance values for key variables influencing the performance of mining projects, including adaptive planning, continuous improvement, iterative methods, and close collaboration. The Pearson correlation between "Performance of Mining Projects" and "Adaptive Planning" is highly significant ($r = .754$, $p < .01$), indicating a strong positive relationship. This suggests that adaptive planning contributes substantially to project performance, corroborating recent findings that emphasize the value of flexibility and adaptability in managing complex mining projects (Müller *et al.,* 2022). Similarly, "Close Collaboration" shows the highest correlation with project performance ($r = .818$, $p < .01$), reinforcing the critical role that stakeholder collaboration plays in improving project outcomes. The strength of this relationship highlights the importance of trust and cooperation among project teams in driving successful project execution (Chen *et al.,* 2023).

The correlation between "Performance of Mining Projects" and "Iterative Methods" is also significant ($r = .613$, $p < .01$), underscoring the effectiveness of iterative approaches in managing mining projects. Iterative methods, which allow for continuous feedback and adaptation, are particularly beneficial in dynamic environments like mining, where unforeseen challenges often arise (Walker & Lloyd-Walker, 2023). Additionally, the correlation between "Continuous Improvement" and project performance, though weaker ($r = .385$, $p < .01$), is still significant, suggesting that continuous refinement of processes also contributes to better project outcomes. The correlation matrix further reveals significant interrelationships between the independent variables. For example, the correlation between "Close Collaboration" and "Adaptive Planning" ($r = .641$, $p < .01$) suggests that collaboration fosters more adaptive planning practices, enhancing project agility (Nguyen *et al.,* 2021). These findings underscore the interconnectedness of these variables in driving project success.

Multiple Regression Analysis

Table 5 presents the combined model summary, highlighting the relationship between various project management practices—namely adaptive planning, continuous improvement, iterative project management, and stakeholder collaboration—and the performance of mining projects. The model demonstrates a robust correlation coefficient (R) of 0.883, indicating a strong linear relationship between the predictors and project performance. The R Square value of 0.780 suggests that approximately 78% of the variance in mining project performance can be explained by the combined effects of the specified predictors, underscoring the significant role of effective management practices in enhancing outcomes. These findings align with recent studies that emphasize the importance of integrated management approaches in achieving superior project outcomes (Khan et al., 2021).

Table 5: Combined Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.883[a]	.780	.775	.09585

a. Predictors: (Constant), Adaptive Planning, Continuous Improvement, Iterative project management, Stakeholders collaboration

Source: **Primary data, (2024).**

Table 6 summarizes the combined ANOVA results, providing insights into the effectiveness of various predictors—namely close collaboration, continuous improvement, adaptive planning, and iterative methods—on the performance of mining projects. The regression model reveals a sum of squares of 5.770 with 4 degrees of freedom, indicating a substantial amount of variance explained by the predictors. The mean square for the regression is calculated at 1.443, resulting in an F-value of 157.012, which signifies a statistically significant relationship between the predictors and project performance ($p < 0.001$). This finding corroborates existing literature that highlights the crucial role of collaborative and adaptive management strategies in enhancing project outcomes in the mining sector (Kumar & Kumar, 2020).

Table 6: Combined ANOVA Results

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.770	4	1.443	157.012	.000[b]
	Residual	1.626	177	.009		
	Total	7.396	181			

a. Dependent Variable: Performance of Mining projects

b. Predictors: (Constant), Close collaboration, Continuous improvement, Adaptive planning, Iterative methods

Source: **Primary data, (2024).**

Table 7 presents the coefficient results for all variables influencing the performance of mining projects, showcasing both unstandardized and standardized coefficients. The model indicates that the constant term is 1.203, with a significant t-value of 8.248 ($p < 0.001$), suggesting a robust baseline performance. Among the predictors, adaptive planning shows a positive and significant relationship with project performance ($B = 0.258$, $\beta = 0.368$, $t = 7.871$, $p < 0.001$), highlighting its crucial role in enhancing outcomes. Conversely, continuous improvement exhibits a negative impact on performance ($B = -0.179$, $\beta = -0.250$, $t = -4.199$, $p < 0.001$), indicating potential misalignment or ineffective implementation within the context. Iterative methods also contribute positively to performance ($B = 0.171$, $\beta = 0.207$, $t = 2.938$, $p = 0.004$), affirming their utility in adaptive project management. Notably, close collaboration emerges as the most influential variable, with the highest standardized coefficient ($B = 0.483$, $\beta = 0.578$, $t = 10.400$, $p < 0.001$), underscoring its significance in driving project success in the mining sector (Ahmed *et al.*, 2022; Choi *et al*., 2021).

Table 7: Coefficient results for all Variables

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.203	.146		8.248	.000
	Adaptive planning	.258	.033	.368	7.871	.000
	Continuous improvement	-.179	.043	-.250	-4.199	.000
	Iterative methods	.171	.058	.207	2.938	.004
	Close collaboration	.483	.046	.578	10.400	.000

a. Dependent Variable: Performance of Mining projects

Source: **Primary data, (2024).**

The beta coefficients of the study were illustrated in table 7. The values of the constant and coefficients enabled the generation of the multiple regression model as follows:

$$\mathbf{Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon}$$

Performance of mining projects = 1.203 + 0.258 Adaptive Planning - 0.179 Continuous Improvement + 0.171 Iterative project management + 0.483 Stakeholders collaboration.

This equation quantifies the relationships among key project management variables, indicating that an increase in adaptive planning directly contributes positively to project performance (B = 0.258), while continuous improvement has a negative effect (B = -0.179), suggesting that its current implementation may be ineffective in enhancing outcomes. Iterative project management is shown to have a positive impact (B = 0.171), reinforcing its significance in promoting flexibility and responsiveness within projects. Most notably, stakeholders' collaboration exhibits the highest positive coefficient (B = 0.483), highlighting its critical role in fostering successful project outcomes through effective communication and cooperation among all parties involved. Collectively, these findings underscore the importance of strategic planning and collaborative approaches in achieving superior performance in mining projects (Bokor et al., 2021; Duan et al., 2022).

CONCLUSIONS

The results indicate significant relationship between agile project management and performance of mining projects in Rwanda.

In conclusion, the findings underscore the pivotal role of adaptive planning in enhancing the performance of mining projects. The strong positive correlation and substantial regression coefficient indicate that effective adaptive planning strategies significantly contribute to project success by allowing organizations to respond flexibly to changing circumstances and uncertainties inherent in the mining sector. The evidence suggests that mining firms that prioritize adaptive planning are better positioned to navigate complex project dynamics, thereby improving overall performance outcomes. Therefore, integrating adaptive planning methodologies into project management practices should be a strategic focus for mining organizations aiming to achieve sustainable and successful project execution.

The conclusions regarding continuous improvement highlight a more nuanced perspective on its impact on mining project performance. While a positive correlation exists, the negative regression coefficient suggests that the current implementation of continuous improvement practices may not effectively translate into enhanced performance outcomes. This indicates a potential disconnect between the intention of continuous improvement initiatives and their actual impact within the mining context. Consequently, mining organizations are encouraged to reassess and tailor their continuous improvement strategies to better align with the specific operational challenges they face, ensuring that these practices are more effectively integrated into the project management process.

The analysis of iterative project management provides strong evidence for its effectiveness in improving mining project performance. The significant positive correlation and robust regression coefficient indicate that employing iterative methodologies can facilitate adaptability and responsiveness, which are essential in the dynamic mining environment. The findings suggest that iterative project management promotes continuous feedback and incremental progress, thereby enhancing project outcomes. As such, mining organizations should prioritize the adoption of iterative methods as a core component of their project management practices to optimize performance and successfully navigate the complexities of their projects.

In conclusion, stakeholders' collaboration emerges as a critical factor influencing the performance of mining projects. The exceptionally strong positive correlation and substantial regression coefficient emphasize that effective collaboration among stakeholders is vital for achieving successful project outcomes. This finding underscores the importance of fostering strong relationships and open communication among all parties involved in mining projects. Therefore, mining organizations should actively promote stakeholder engagement and collaboration strategies, as these efforts can lead to enhanced decision-making, resource sharing, and problem-solving capabilities, ultimately driving improved performance and sustainability in mining operations.

RECOMMENDATIONS

Based on the regression analysis, mining organizations in Rwanda are encouraged to prioritize stakeholders' collaboration as a core strategy for enhancing project performance. The findings demonstrate that close collaboration among stakeholders yields the highest positive influence, emphasizing the need for robust communication channels, participatory decision-making, and resource sharing. Mining companies should foster an inclusive culture that encourages active engagement of all stakeholders, including government agencies, local communities, investors, and contractors. Implementing structured frameworks for stakeholder collaboration, such as regular review meetings and feedback systems, can further enhance trust and alignment among all parties, ultimately contributing to the successful execution of mining projects.

Moreover, the study underscores the value of adaptive planning and iterative project management as essential practices for improving project outcomes. Mining firms should adopt flexible planning tools and iterative methodologies to address the dynamic nature of the mining environment. This involves investing in training programs to enhance project teams' capabilities in adaptive and iterative practices, as well as leveraging project management software to facilitate real-time adjustments. The negative impact of continuous improvement highlights the need to reevaluate and refine these initiatives, ensuring alignment with the sector's specific challenges. Organizations should develop a comprehensive feedback mechanism to identify and address gaps in continuous improvement strategies, thereby enhancing their effectiveness. These recommendations, when implemented collectively, can significantly bolster the performance and sustainability of mining projects in Rwanda.

Suggestions for Further Studies

Future research could explore the impact of Agile Project Management practices on the performance of mining projects across different contexts, such as other industries or countries, to compare and generalize findings. Additionally, examining the moderating effects of external factors, such as regulatory frameworks, technological advancements, and socio-economic conditions, could provide deeper insights into how these variables influence project outcomes. Studies focusing on the long-term sustainability of Agile practices and their integration with traditional project management methods in the mining sector would also be valuable. Furthermore, qualitative research approaches, such as case studies or interviews with key stakeholders, could offer a more nuanced understanding of the challenges and opportunities associated with implementing Agile methodologies in mining projects.

REFERENCES

Adeleke, A. Q., Bahaudin, A. Y., & Kamaruddeen, A. M. (2018). Organizational internal factors and construction risk management among Nigerian construction companies. Global Business Review, 19(4), 921–938.

Adeyemi, A., & Ogunlana, S. (2019). Infrastructure development and urbanization in the mining industry. *Journal of Urban Development Studies, 25*(3), 456–470.

Ahiaga-Dagbui, D., & Smith, A. (2019). Tackling project delays and cost overruns in South African mining. *Construction Management and Economics, 37*(5), 340–354.

Ahmed, R., Khandoker, M. T., & Ali, H. (2019). Strategic objectives and project alignment in organizational success. *Management Research Review, 42*(7), 1205–1220.

Akinsola, A., & Oyedele, L. (2019). Budget allocation for infrastructure projects in South Africa. *Public Budgeting & Finance, 39*(4), 85–102.

Alinaitwe, H., Mwakali, J., & Ahmed, A. (2019). Addressing resistance to Agile in the construction sector in Rwanda. *Rwandan Journal of Construction Studies, 8*(2), 72–90.

Amason, A. C. (2021). Resource constraints and project prioritization. *Academy of Management Perspectives, 35*(3), 244–260.

Ambler, S. W. (2022). Disciplined Agile delivery: A practitioner's guide to Agile software delivery in the enterprise. IBM Press.

Balikuddembe, E., Nalwadda, A., & Namagembe, D. (2019). Traditional project management practices in Uganda. *East African Journal of Project Management, 15*(2), 89–102.

Beck, K., & Beedle, M. (2021). Manifesto for Agile software development. Agile Alliance. Retrieved from https://agilemanifesto.org

Boehm, B., & Turner, R. (2022). Balancing agility and discipline: A guide for the perplexed. Addison-Wesley Professional.

Bryman, A. (2019). Social research methods (5th ed.). Oxford University Press.

Cândido, J., & Santos, A. (2021). Agile methodologies in mining projects. *International Journal of Project Management, 39*(6), 915–930.

Cervone, H. F. (2016). Project management models as applied to digital library projects. OCLC Systems & Services, 22(2), 122–127.

Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2018). *Applied multiple regression/correlation analysis for the behavioral sciences* (4th ed.). Routledge.

Conforto, E. C., Salum, F., Amaral, D. C., da Silva, S. L., & de Almeida, L. F. M. (2016). Can Agile project management be adopted in non-software projects? Project Management Journal, 45(3), 21–34. https://doi.org/10.1002/pmj.21412

Creswell, J. W. (2022). Research design: Qualitative, quantitative, and mixed methods approach (6th ed.). SAGE Publications.

DeVellis, R. F. (2019). *Scale development: Theory and applications* (4th ed.). Sage Publications.

Dingsøyr, T., Moe, N. B., Faegri, T. E., & Seim, E. A. (2022). Exploring the relationship between project management and Agile: A case study. Journal of Systems and Software, 190, 111208.

Dingsøyr, T., Nerur, S., Balijepally, V., & Moe, N. B. (2012). A decade of Agile methodologies: Towards explaining Agile software development. Journal of Systems and Software, 85(6), 1213–1221.

Drost, E. A. (2019). Validity and reliability in social science research. *Education Research and Perspectives*, *38*(1), 105-123.

Dybå, T., & Dingsøyr, T. (2018). Empirical studies of Agile software development: A systematic review. Information and Software Technology, 50(9-10), 833–859.

Field, A. (2018). *Discovering statistics using IBM SPSS statistics* (5th ed.). Sage Publications.

Field, A. (2020). *Discovering statistics using SPSS* (6th ed.). Sage Publications.

Frost, J. (2021). *Statistics: A tool for social research* (11th ed.). Cengage Learning.

Garel, G. (2018). A history of project management models: From pre-models to the standard models. International Journal of Project Management, 31(5), 663–669.

Gasana, F., Rwigema, J., Tindiwensi, A., & Uwamahoro, M. (2019). Enhancing project performance in Rwanda's mining industry. *Rwanda Journal of Engineering, 10*(1), 34–52.

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2022). *Multivariate data analysis* (8th ed.). Pearson Education.

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2019). *Multivariate data analysis* (8th ed.). Pearson Education.

Heaslip, G., & Zou, W. (2018). Sustainability in Agile project management: A literature review. International Journal of Agile Systems and Management, 11(1), 20–39.

Highsmith, J. (2022). Agile project management: Creating innovative products (3rd ed.). Addison-Wesley Professional.

Hoda, R., Noble, J., & Marshall, S. (2020). Agile under pressure: Maintaining trust and collaboration in a big room planning process. Empirical Software Engineering, 25(3), 1–37.

Hosseini, A., Aibinu, A., & Chileshe, N. (2020). Barriers to integrating sustainability into Agile project management in the construction industry. Built Environment Project and Asset Management, 10(5), 731–746.

Jiang, T., & Xue, Y. (2019). Flexible project management approaches for mining. *Asian Mining Journal, 22*(4), 293–307.

Jiang, Y., Zhu, K., & Zhang, Y. (2020). Risk management for complex engineering projects: A review of current research and future trends. International Journal of Project Management, 38(3), 177–190.

Kasimu, K., & Ogunlana, S. (2019). Improving design processes in civil engineering projects. *Engineering Management Journal, 31*(1), 12–20.

Kiggundu, J., Nakibuuka, S., & Ssembatya, J. (2020). Challenges in the adoption of Agile principles in Uganda. *African Journal of Software Development, 5*(1), 45–59.

Kothari, C. R. (2022). *Research methodology: Methods and techniques* (4th ed.). New Age International Publishers.

Kothari, C. R., & Gaurav, G. (2022). Research methodology: Methods and techniques (4th ed.). New Age International Publishers.

Kozan, E., & Ulubeyli, S. (2019). Strategic planning in project execution. *International Journal of Strategic Management, 14*(3), 78–90.

Leach, L. P. (2019). Critical chain project management (3rd ed.). Artech House.

Leffingwell, D. (2020). Scaled Agile framework for Lean Enterprises: SAFe 5.0. Scaled Agile Inc.

Leite, H., & Anbari, F. (2019). The evolution of Agile Project Management. *Journal of Modern Project Management, 7*(2), 22–33.

Li, Z., & Yang, Y. (2019). Scrum framework implementation in China. *Asian Journal of Project Management, 11*(4), 256–270.

Moe, N. B., Aurum, A., & Dybå, T. (2012). Challenges of shared decision-making: A multiple case study of Agile software development. Information and Software Technology, 54(8), 853–865.

Mugenda, O. M., & Mugenda, A. G. (2019). *Research methods: Quantitative and qualitative approaches*. Acts Press.

Mugyenyi, P. (2020). Challenges and opportunities in Rwanda's mining sector: A focus on improving project performance. Journal of African Resource Economics, 5(2), 45–60.

Muller, R., Drouin, N., & Sankaran, S. (2020). Balancing agility and traditional approaches in project management: A retrospective study. Project Management Journal, 51(2), 160–176.

Munns, A. K., & Bjeirmi, B. F. (2021). Evaluating project success in Agile environments. *Project Management Review, 38*(3), 412–425.

Odeh, A. M., & Battaineh, H. T. (2019). Persistent cost overruns in civil engineering. *Construction Research Journal, 24*(2), 100–115.

Ofori-Kuragu, J., & Frimpong, Y. (2019). Balancing the triple constraint in project management. *West African Journal of Project Studies, 14*(3), 321–340.

Oso, W., & Onen, D. (2019). *A general guide to writing research proposals and reports* (4th ed.). Jomo Kenyatta Foundation.

Pich, M., Loch, C. H., & Meyer, A. D. (2022). On uncertainty, ambiguity, and complexity in project management. Management Science, 48(8), 1008–1023.

Purnama, A., & Subroto, B. (2019). Mining industry contributions to global GDP. *Mining Economics, 45*(2), 150–163.

Rigby, D. K., Sutherland, J., & Takeuchi, H. (2016). Embracing Agile. Harvard Business Review, 94(5), 40–50.

Rwanda Mines, Petroleum and Gas Board. (2022). Annual report on the performance of Rwanda's mining sector. Kigali: Government of Rwanda.

Schlichter, B., Robertson, S., & Sharma, R. (2019). Agile principles beyond software development. *Industrial Engineering Review, 33*(4), 403–420.

Schober, P., Boer, C., & Schwarte, L. A. (2018). Correlation coefficients: Appropriate use and interpretation. *Anesthesia & Analgesia*, *126*(5), 1763-1768.

Schwaber, K., & Sutherland, J. (2019). The Scrum guide: The definitive guide to Scrum: The rules of the game. Scrum.org.

Schwaber, K., & Sutherland, J. (2020). The Agile mindset and its implications for leadership. Journal of Leadership & Organizational Studies, 27(3), 322–330.

Serrador, P., & Pinto, J. K. (2021). Does Agile work? A quantitative analysis of Agile project success. International Journal of Project Management, 39(3), 235–243.

Serrador, P., & Pinto, J. K. (2021). The role of Agile practices in project success. *Journal of Modern Project Management, 9*(1), 15–25.

Shen, H., & Li, W. (2020). Scrum team dynamics in project delivery. *China Journal of Agile Project Management, 6*(3), 211–225.

Slovin, S. (1967). Slovin's formula for sampling. Journal of Educational Research, 20, 453–467.

Sutherland, J. (2014). Scrum: The art of doing twice the work in half the time. Crown Business.

Tabachnick, B. G., & Fidell, L. S. (2021). *Using multivariate statistics* (7th ed.). Pearson Education.

Tavakol, M., & Dennick, R. (2021). Making sense of Cronbach's alpha. *International Journal of Medical Education, 12*, 53-55.

Tzortzopoulos, P., Emmitt, S., & Storbjork, A. (2019). Iterative planning in Agile methods. *Lean Construction Journal, 25*(1), 42–55.

World Bank. (2019). Infrastructure development and Vision 2050 in Rwanda. *World Bank Development Reports, 14*(3), 85–96.

Wu, J., & Zhang, Q. (2020). Scrum adoption trends in China. *Asian Project Management Review, 8*(2), 101–118.