VILNIUS UNIVERSITY
BUSINESS SCHOOL

MASTER OF INTERNATIONAL PROJECT MANAGEMENT

Syed Hamza Qaiser Shah

THE FINAL MASTER'S THESIS (PROJECT)

PROJEKTŲ VALDYMO PROCESŲ TOBULINIMAS PASITELKIANT DIRBTINĮ INTELEKTĄ.	**ENHANCING PROJECT MANAGEMENT PROCESSES WITH ARTIFICIAL INTELLIGENCE**

Student _____

(Signature)

Supervisor _____

(Signature)

Dr. Andrius Valickas

Vilnius, 2025

SUMMARY

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ENHANCING PROJECT MANAGEMENT PROCESSES WITH ARTIFICIAL INTELLIGENCE

Supervisor – Dr. Andrius Valickas

Master's thesis (project) was prepared in Vilnius, in 2025

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The FMTP described in brief:

The increasing integration of artificial intelligence into project management has created new opportunities to enhance project efficiency; however, the mechanisms through which AI delivers these benefits remain insufficiently understood. This study examines the impact of AI use in project management on project efficiency, with a particular focus on the mediating role of AI tool usability. Grounded in the Technology Acceptance Model, the study seeks to explain how employees' perceptions of usability influence the effectiveness of AI adoption in project environments.

A quantitative, cross-sectional research design was employed, and data were collected through a structured questionnaire administered to professionals involved in AI-supported project management activities. The study utilized validated measurement scales, and the data were analysed using descriptive statistics, reliability analysis, correlation analysis, regression analysis, and mediation analysis. The results reveal that AI use has a significant positive effect on project efficiency and AI tool usability. Furthermore, AI tool usability was found to have a strong positive impact on project efficiency and to partially mediate the relationship between AI use and project efficiency.

The findings highlight that AI adoption alone is insufficient to achieve optimal project efficiency unless AI tools are perceived as user-friendly and easy to integrate into project workflows. This study contributes to the existing literature by empirically validating the mediating role of usability in AI-enabled project efficiency, particularly within a developing-country context. Practically, the results offer valuable insights for organizations seeking to enhance project performance by emphasizing usability, user-cantered design, and employee training in AI implementation strategies.

SANTRAUKA

VILNIAUS UNIVERSITETO VERSLO MOKYKLA

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SYED HAMZA QAISER SHAH

PROJEKTŲ VALDYMO PROCESŲ TOBULINIMAS PASITELKIANT DIRBTINĮ INTELEKTĄ

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FMTP trumpas aprašymas:

Didėjanti dirbtinio intelekto integracija į projektų valdymą sudaro naujas galimybes didinti projektų efektyvumą, tačiau mechanizmai, kuriais dirbtinis intelektas užtikrina šiuos privalumus, vis dar nėra pakankamai aiškūs. Šiame tyrime nagrinėjamas dirbtinio intelekto naudojimo projektų valdyme poveikis projektų efektyvumui, ypatingą dėmesį skiriant dirbtinio intelekto įrankių naudojimo patogumo tarpininkaujančiam vaidmeniui. Remiantis Technologijų priėmimo modeliu, tyrimu siekiama paaiškinti, kaip darbuotojų suvokiamas naudojimo patogumas lemia dirbtinio intelekto diegimo veiksmingumą projektinėje aplinkoje.

Taikytas kiekybinis, skerspjūvio tyrimo dizainas, o duomenys rinkti naudojant struktūruotą klausimyną, pateiktą specialistams, dalyvaujantiems dirbtinio intelekto palaikomuose projektų valdymo procesuose. Tyrime naudotos patikrintos matavimo skalės, o duomenų analizė atlikta taikant aprašomąją statistiką, patikimumo analizę, koreliacinę analizę, regresinę analizę ir mediacijos analizę. Tyrimo rezultatai parodė, kad dirbtinio intelekto naudojimas daro statistiškai reikšmingą teigiamą poveikį projektų efektyvumui ir dirbtinio intelekto įrankių naudojimo patogumui. Taip pat nustatyta, kad dirbtinio intelekto įrankių naudojimo patogumas

pasižymi stipriu teigiamu poveikiu projektų efektyvumui ir iš dalies tarpininkauja ryšiui tarp dirbtinio intelekto naudojimo ir projektų efektyvumo.

Tyrimo rezultatai pabrėžia, kad vien dirbtinio intelekto diegimas nėra pakankamas siekiant optimalaus projektų efektyvumo, jei dirbtinio intelekto įrankiai nėra suvokiami kaip patogūs naudoti ir lengvai integruojami į projektų darbo eigą. Tyrimas prisideda prie esamos mokslinės literatūros, empiriškai patvirtindamas naudojimo patogumo tarpininkaujančią reikšmę dirbtinio intelekto sąlygotam projektų efektyvumui, ypač besivystančios šalies kontekste. Praktiniu požiūriu rezultatai suteikia vertingų įžvalgų organizacijoms, siekiančioms gerinti projektų rezultatus, akcentuojant naudojimo patogumą, į naudotoją orientuotą dizainą ir darbuotojų mokymą dirbtinio intelekto diegimo strategijose.

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List of Abbreviation

Abbreviation	Full Form
PM	Project Management
AI	Artificial Intelligence
PMI	Project Management Institute
TAM	Technology Acceptance Model

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1. INTRODUCTION

The adoption of Artificial Intelligence technologies in project management has drastically transformed the approaches used in structuring, implementing, and supervising projects in the recent past. More modern and complex driven projects require understanding, adaptation, and continuous evolution in order to outpace the conventional management tools which rely upon static historical and linear data correlation. According to Hashfi and Raharjo (2023) and Diameh et al. (2025) projects, which involve predictive analytics, automation, and data-driven decision-making tools, redefine pivots in project management concerning contemporary approaches to PM outcomes. In a survey (2025, PMI), 81% of the high-performing organisations claimed to have incorporated AI systems in their project delivery models, which highlights the indispensable advocacy these global leaders in project delivery have in AI project management systems.

The application of AI technologies has greatly enhanced the precision forecasting of project schedules, deadlines, milestones, costs, and resources in addition to resource bottlenecks and delays through triaging over expenditure using AI. Enhanced automation of predictive decision-making systems brings about improved decision-making in addition to eliminating uncertainty. AI tools, particularly through natural language processing and machine learning, now aid in the analysis of large volumes of project documents and automation systems to help in risk forecasting, communication, and even scheduling automation, improving collaboration amongst stakeholders (Pal et al., 2023). AI responds to real-time data inputs, adjusting project timelines in real time. While this feature is commonplace, the ability to perform dynamic scheduling greatly improves the responsiveness of project management in changing project environments (Bento et al., 2022). AI tools particularly benefit and are in these complex and high-risk areas of project management, construction, information technologies, and even defence industries where precision is the key.

Impediments to implementing AI successfully in project management include technology usability and employee skill level, as well as other organisational factors. Competent project teams with skilful interpreters and decision-makers are necessary to realise value from advanced AI tools (Taheri Khosroshahi, 2024; Zadeh et al., 2024). AI tools with poor usability, due to their complex nature, result in low adoption rates and, in turn, underperformance of the project as a whole (Somanathan, 2023; Salimimoghadam et al., 2025). Therefore, the application of AI in management systems and the success of the project do not exhibit a direct relationship, as this association is dependent upon and influenced by several human and organisational factors.

To fully appreciate the ways AI can be leveraged to enhance project success, it is important to understand some mediating factors, which are not frequently discussed in the academic literature. Some prior studies have utilised the Technology Acceptance Model to examine the adoption complexities and willingness of team members to adopt the new technology (Jiang & McCabe, 2021; Wijnhoven, 2022; Bharati & Sandbrink, 2024; Chinedu & Serrano-Tamayo, 2024). Nonetheless, there is still a scarcity of empirical research that quantitatively investigates the relationship TAM poses in regard to project cross-productivity in project-driven organisations. The absence of comprehensive research that investigates the mediating role of the usability of AI tools is indeed a critical shortcoming in existing research.

1.1. Research Background and Context

1.1.1. Problem Statement

Current projects require more responsive, information-centric, and anticipatory management systems in comparison to what traditional tools offer due to their compounded scale and complexity. Although projects continue to fail to integrate due to delays, cost overruns, and inefficient risk management, AI adoption in project management is seen as a game-changer to improve precision in corporate decisions and working processes (Harvard Business Review, 2016; Pereira et al., 2021; Marnewick & Marnewick, 2022; PMI, 2023). Nonetheless, in contexts where AI is employed for purposes like scheduling and timely delivery, the AI-augmented axiom is still largely unexplored.

AI tools still face challenges related to usability, adoption, and alignment with team skills and willingness, which impacts their proven success in the real world. There is evidence to suggest that in the absence of the appropriate understanding and technical knowledge, project teams struggle to either interpret or adequately integrate AI insights into their workflows (Karamthulla et al., 2024; Taheri Khosroshahi, 2024). Furthermore, a lack of contextual adaptability alongside interface design often contributes to the AI systems being underutilised, which in turn limits AI’s contribution to project success (Alevizos et al., 2024; Bharati & Sandbrink, 2024; Salimimoghadam et al., 2025). These issues highlight a more profound concern: the blend of human, organisational, and technical dimensions critically impact the degree to which AI either improves or deteriorates project performance.

Existing scholarly works have not sufficiently developed reliable quantitative frameworks that investigate the ways AI impacts vital project outcomes like project execution efficiency. Theoretical concepts like AI tool usability as a mediator has not been fully explored or tested through empirical research. The lack of such tested frameworks results in a gap in academic knowledge and in managerial applications. Solving this problem is critical not only

for understanding the more practical sides of AI use in project settings but also for helping organisations fully harness AI capabilities.

1.1.2. Research Question

This research is developed around one major research question that talks about the role that artificial intelligence could play in enhancing the efficiency of the project management industry. The following is the question that this study has to answer at the end:

RQ. Does the use of AI in project management increase project efficiency, and does AI tool usability support this relationship as a mediator?

1.1.3. Research Objectives

The major focus of this research is to explore how AI usage in project management impacts project efficiency, while examining how this relationship works through a detailed analysis of each mechanism involved in this relationship. The objective is to determine the direct impact that AI usage has on project efficiency, to assess how AI usage affects employee perception of the usability of AI tools, and to determine whether the usability of AI tools is a mediator between the use of AI and project efficiency. The SMART objectives of this research are:

- To identify the impact of use of AI in PM on project efficiency.
- To identify the relationship between AI use in PM and AI tool usability,
- To identify the influence of AI tool usability on project efficiency.
- To examine the mediating role of AI tool usability between use of AI in PM and project efficiency.

1.1.4. Significance of the Study

This study holds significance both academically and practically as it addresses a critical intersection between AI and PM, two domains increasingly central to organizational competitiveness. As organizations pursue digital transformation, AI is being integrated into various project phases—planning, execution, risk assessment, and communication (Scholapurapu, 2024; Nabeel, 2024). However, empirical research that quantifies the relationship between AI usage and project performance, especially in terms of efficiency, remains sparse. By offering a data-driven exploration of these links, this study contributes to closing the knowledge gap in AI-enhanced project management literature.

Practically, the findings of this study can help organizations and project leaders make informed decisions about investing in and integrating AI tools. According to the Project Management Institute the global project economy expected to grow to $20 trillion by 2027 – generating countless jobs and challenges for 88 million people (ISO, 2022), even marginal

improvements in efficiency through AI can translate into significant cost savings and improved project outcomes. In addition, the study's findings on the mediating role of AI tool usability shed light on the specific factors that influence the effectiveness of AI integration. This may help inform training, selection of tools, and policies for AI integration in various sectors.

In addition, this research promotes further theory development by evaluating a blended technological and human approach framework. Many prior AI in PM studies concentrated on either the technological determinants of the firm or its organisational readiness (Jiang & McCabe, 2021; Chinedu & Serrano-Tamayo, 2024). This study uniquely adds the human component by incorporating tool usability, thus capturing the implementation environment and helping to validate the TAM. The inclusion of these dimensions provides the study with sound theory and significant utility.

1.1.5. Scope and Delimitations

In this research, the focus is limited to evaluating the impact of AI usage in project management on the success of a project in the areas of productivity. The research explores the influence of the usability of AI tools on this relationship. The study is conducted using primary quantitative data obtained from professionals in project management working in industries like construction, information technology, and engineering where AI is relevant. This emphasis offers a streamlined, precise, and statistically analysable study, capturing the increasing importance of AI in many fields.

Despite its relevance, several delimitations must be acknowledged. First, the study does not account for long-term AI integration outcomes or post-project effects, as it employs a cross-sectional design rather than a longitudinal one. Second, the research is limited to organizations that already use or are in the process of adopting AI tools, thereby excluding those without AI exposure. Third, while project success is multi-dimensional—including quality, client satisfaction, and scope adherence—this study restricts its analysis to efficiency to maintain analytical clarity. These delimitations, though necessary, imply that the findings should be interpreted within the boundaries of these variables and contexts.

Moreover, the study assumes that respondents possess accurate and sufficient knowledge about the AI tools used in their organizations. It also assumes a level of consistency in how project success is evaluated across different organizations and sectors. While every effort will be made to ensure the reliability and validity of the survey instrument, some degree of subjective bias is inevitable in self-reported data. Nonetheless, by clearly outlining these delimitations, the study ensures transparency and provides a foundation for future research that may expand or refine the scope.

1.2. Theoretical foundation of the study

1.2.1. AI in Project Management

Artificial Intelligence is understood as the ability of machines and computer systems to perform activities associated with human intelligence, which includes learning, reasoning, problem-solving, and making decisions (Russell et al., 2021). In the domain of project management, AI implementations include the application of intelligent algorithms, machine learning models, and natural language processing systems that assist project teams with scheduling, forecasting, and outcome prediction (Pal et al., 2023). For the purposes of this study, we define AI as a strategic enabler integrated into the project lifecycle—from the planning phase, resource allocation, tracking to monitoring, and even through problem resolution. AI is relevant to this study because it has the ability to simplify intricate project tasks and offload the mental burden of the managers, thus enhancing the project o6utcomes. While AI technologies are heterogeneous, this study treats AI as a unified multi-layered system which reflects the degree of technological sophistication, automation, and intelligent systems embedded in the processes of the project.

Project management has expanded from just automation and analytics through the introduction of AI, changing the way teams communicate and collaborate, as well as providing tools for real-time sharing of project-related data. By bringing all of the information into one central location and providing easy access to insights from this data, AI enables a project to operate in alignment with its goals and timelines. Existing research suggests that the increased information flow, coordination, and support from intelligent systems improve project efficiency and reduce delays caused by the fragmentation of information due to miscommunication (Zidane & Olsson, 2017; Dwivedi et al., 2021). Therefore, the use of AI contributes to reducing delays during project execution by providing a more coordinated and responsive environment.

The benefits of AI to project management extend beyond increased efficiency through support for proactive and adaptive management practices; AI models enable predictive capabilities that allow project managers to identify potential problems associated with delays, overruns, and resource availability prior to the events occurring, thereby taking corrective action before the delay, cost overrun, or resource availability becomes an issue. This predictive ability has the greatest impact on projects that are executed in an unpredictable manner (both from a scheduling and cost standpoint), where timely adjustments must be made to ensure project execution efficiency. Several studies show that projects that utilise AI forecasting and support systems for decision-making experience greater control over the changing variables of a project than projects utilising conventional project management techniques, resulting in increased efficiency (Nama, 2022; Nabeel, 2024). The study findings

support the position that AI can provide businesses with a strategic tool to achieve efficient management of projects through improved execution processes and improved management foresight.

Use of AI in Enhancing Project Efficiency

Project efficiency entails the culmination of goals within set time, budget, and manpower limits (Zidane & Olsson, 2017). In this study, project efficiency as a relative measure of project success focuses on the operational performance of projects with AI systems. It includes the measurement of meeting deadlines, financial expenditure, and the spending of resources. Prior studies confirm the efficiency of AI with scheduling, reporting, and data processing in real time (Nama, 2022). Therefore, in this study, project efficiency is approached as an embedded AI indicator of the daily operations of a project, rather than a mere outcome indicator. This construct is important for any organisation that aims to measure AI's return on investment through increased productivity and a reduction in costs.

There is evidence that integrating AI into the management and execution of projects significantly boosts both the effectiveness and efficiency of projects through enhanced planning accuracy, better resource allocation, and optimal real-time monitoring of projects. Project managers can now employ AI-based tools to analyze large amounts of project data, discover patterns, and develop predictive data that enables them to make informed decisions regarding project scheduling, budgets, and risk management, thus decreasing the number of uncertainties surrounding the scheduling and budgeting of projects (Khan, 2025). By implementing AI applications for predictive analytics and intelligent scheduling systems, project execution times have been significantly reduced, and resources have been optimally utilized on many projects (Nabeel, 2024; Hossain et al., 2024).

There is also another aspect to consider regarding the use of artificial intelligence, namely that by automating many of the routine and day-to-day tasks involved in project management, the use of AI enhances efficiency, giving project managers more time to focus on those activities that create more value (Pal et al., 2023). Using AI also reduces the chances of human error, accelerates reporting, and creates improved coordination among all project participants. Empirical evidence demonstrates that organizations utilizing AI-based decision-making support systems realize enhanced workflow, quicker response times, and improved controls for managing projects (Tanim & Ahmad, 2025). Therefore, from an evidence-based perspective, these studies indicate that AI can offer a dual benefit: increasing the technological capabilities of organizations while providing a strategic mechanism for executing projects more effectively within complex and rapidly changing environments.

Impact of Use of AI on AI Tool Usability

The actual use of AI in organisational settings plays a critical role in shaping employees' perceptions of tool usability. Usability is explained as the effectiveness, degree of efficiency, and satisfaction of intended users (Bevan, 1995; ISO, 2018) and is not just a characteristic of a design but an outcome of the interaction and experience with a system in use. What employees think about a system is based on the practicality of the system in terms of ease of use, system reliability, and the support in performing the task, termed as perceived usability (Babar et al., 2025). It is shown in the literature that interaction with AI-based systems is a major contributor to familiarity and competence, thus enhancing positive assessments of usability while reducing negative attitudes towards device use (Dwivedi et al., 2021; Robert & Sudarsanan, 2025). This means that the use of AI tools not only fosters adoption but also determines the employee perception of the sophistication and ease of use of the automated tools.

Artificial intelligence affects managers' view of AI tool usability. Additionally, AI-assisted processes have allowed employees to become more familiar with AI tool functions, AI-supported work processes, and decision-support systems, thereby enhancing the perceived ease of use (Diameh et al. (2025). It is evident from the TAM that repeated use of an AI tool allows a manager to experience reduced levels of cognitive effort and use uncertainty, and incorporates AI tool capabilities more effectively into day-to-day work tasks, such as planning via scheduling or monitoring project performance (Bharati & Sandbrink, 2024). Empirical studies show that when AI tools are integrated throughout project planning, scheduling, and monitoring activities, employees view AI tools as more user-friendly, practical, and reliable than complex or disruptive.

In addition, artificial intelligence used in project management enhances the usability of these systems through the ability to track how people work and the environment in which they are working on projects. The majority of modern-day "artificial intelligence technologies" have mechanisms built into them that allow for the continual refinement of their interface, suggestions, and automated capabilities based upon user interactions with the system, thereby improving usability over time. Research has shown that these types of systems provide greater user satisfaction and improve perceived usability because they better align with users' expectations and the ways they make their decisions (Robert & Sudarsanan, 2025). Project environments provide an additional benefit for adaptive-type systems, as people working in these environments are usually under significant time constraints and therefore need tools that are easy to use and able to respond to a rapidly changing project environment. Therefore, the greater the use of "AI technologies" within a project environment,

the greater the confidence of workers in their ability to use the tools to fulfil their roles effectively and efficiently.

1.2.2. The Role of AI Tool Usability (Mediator)

Usability describes how effective, efficient, and satisfying a given system is (ISO, 2018). For this thesis, usability is taken as a mediating variable that explains the mechanism by which AI use in a project leads to better project outcomes. Usability is often noted as a major factor that influences the adoption of a new technology (Almogren et al., 2024). In the case of AI, it encompasses user-friendliness of the interface, ease of system training, system transparency, and AI recommenders' explanation clarity (Virvou, 2023; Namoun et al., 2024; Sakpere et al., 2024). It is argued in this study that the most advanced AI systems will not enhance project efficiency unless they are user-friendly and accessible to the project teams. Hence, the usability of AI tools as a moderator provides great insights concerning the actual implications of AI technology and the disparity between technical capability and usefulness.

Adopting AI brings about better insights and automated activities, but these new systems will not provide any type of improvement in productivity until workers can effectively engage with them. Repeatability also serves as the connection that allows for the transition of the technical ability of the AI to provide value for its users; this is achieved by determining the ease with which users can comprehend, have faith in, and carry out AI-generated insights as part of their tasks related to projects. Based on past studies utilizing the Technology Acceptance Model, it is apparent that perceived ease of use is one of the significant factors that facilitate the effective use of technology and ultimately result in both the user's approach and usage behaviour (Bento, 2022; Cioc & Longo, 2023). In the context of a project environment where fast decision-making and complete information sharing are prevalent, usability serves as the direct link between AI usage and efficiency results.

Several studies have previously established that usability serves as a mediator between AI-enabled performance relations. In particular, results demonstrate that while there is evidence that AI systems increase project and operational performance, users perceive an increased usability of AI systems, which leads to sustained use, reduced cognitive burden, and improved decision-making quality (Virvou, 2023; Namoun et al., 2024). Usability has also been shown to mediate the effects of advanced digital technologies on performance outcomes through increased ease of interaction between users and AI (Almogren et al., 2024; Sakpere et al., 2024). In the context of project management, for example, simply adopting or using an AI tool will not necessarily result in improving the efficiency of project management unless project team members feel that the AI tool is user-friendly, intuitive, and supportive of their work processes. Therefore, usability is the key factor that reveals how AI use will lead to

tangible improvements in project management efficiency, which continues to position usability as a significant mediation factor when developing integrated project management approaches based on AI technologies.

1.2.3. Impact of AI Tool Usability on Project Efficiency

AI tools are usable if the potential for their use will vary in regard to how efficiently the company carries out its business processes. System usability complements employee productivity due to the fact that proper systems are designed to eliminate surplus thinking, minimise mistakes, and boost productivity (Ajani et al., 2020; Paul et al., 2023). Organisationally, Kozhakhmetova et al. (2024) ascertain that smoother AI use promotes efficient use and timely decision-making. As usability increases, systems that are user-friendly tend to boost satisfaction and performance, which subsequently improves productivity and timely completion (Dwivedi et al., 2021). These findings support the argument that the consideration of the usability of AI tools is not merely for technical reasons but strategic in bolstering timely project completion.

An important influence on how successfully AI tools function in assisting the improvement of project efficiencies through the use of user-friendly systems. User-friendly systems facilitate employee use of AI tools by requiring less cognitive load during the employee's interaction with the system. Employees are more likely to use AI tools for their planning, scheduling, monitoring, and decision-making tasks (Jiwane, 2025) when they believe that the systems will be easy to use and intuitive and can be easily assimilated into their ongoing workflows. The previous study indicates that when users can use these AI systems with a high level of system usability, they will have less resistance to adopting such technologies, will make fewer mistakes with their usage, and will complete their work activities in less time, which all promote improved project efficiency (Hulu et al., 2024; Hossain et al., 2024). In project-based workplaces where project employees face high levels of both time sensitivity and responsibilities related to the coordination of multiple tasks across multiple project team members, high-usability AI tools can assist in quicker task processing speeds and enable efficient completion of planned project task execution and fulfilment.

AI usability increases project speed because multiple members of a project team can use the same AI tool effectively and consistently. There is evidence to suggest that even advanced AIs do not enhance performance if their end-users do not engage or take full advantage of them due to usability challenges (Paul et al., 2023). On the other hand, if AI tools are user-centric, they will allow employees to utilize AI-generated insights to maximize resource allocation, improve coordination, and address potential project issues before they arise, due to the intuitive design and user-friendly nature of AI tools. Usability-driven adoption

of AI tools also contributes to improved project control and enhanced decision-making quality, resulting in improved efficiency and more predictable project results (Kozhakhmetova et al., 2024). Therefore, the findings highlight the importance of usability as the primary mechanism through which AI technology can be leveraged to create project-based efficiencies from the use of AI tools.

1.2.4. Theoretical Framework Supporting the Model

The Technology Acceptance Model was first introduced by Davis in 1989 and remains one of the most adopted frameworks in detailing the acceptance and usage of a technology (Davis, 1989a; Davis, 1989b). He suggests technology acceptance evolves from the two perceptions: Perceived Usefulness (PU) and Perceived Ease of Use, which define the system use and the outcome of the system (Hussain et al., 2025). This model is among the models that are widely used in research by researchers whenever there is any discussion or work on the adoption or use of tools that are linked with technology.

Taking into account the scope of the study, the independent variable, AI Use, pertains to the adoption and application of AI tools in dealing with the project's requirements. The mediator, AI Tool Usability, aligns with TAM's concept of Perceived Ease of Use, as it captures the extent to which users consider AI tools as supportive, user-friendly, uncomplicated, and a seamless add-on to their workflows (Malik, 2023). Usability serves as instrumental in defining the linkage between the AI system's use on the project and the project outcome, since even sophisticated AIs will not yield the intended outcome in efficiency if users consider the system as complex and difficult to use.

Project efficiency is a dependent variable whose attribution aligns with the assumption of the TAM that widespread acceptance and effective utilisation of a technology improve performance on tasks and overall organisational outcomes (Shahid et al., 2021; Vărzaru, 2022). This theory broadens the TAM by addressing the effectiveness of AI adoption in improving project efficiency in terms of its usability. This suggests that the more usable an AI-based tool is, the more employees in the organisation will easily learn it and finally adopt it into their routine work. As a result, their efficiencies will increase, which will be witnessed in the overall efficiency of the organisation in the market.

1.2.5. Research Gap

The intersection of AI and project management has received increasing academic interest over the past decade; however, the literature remains fragmented, and several key gaps persist. First, while numerous studies have qualitatively explored the potential of AI in project environments (e.g., predictive analytics, resource optimization, and dynamic scheduling (Salimimoghadam et al., 2025; Khan, 2025), few have moved beyond conceptual

discussion to offer empirical validation of these claims (Hossain et al., 2024; Nabeel, 2024). Most existing research is either theoretical or limited to specific industries such as construction or Information technology, with little generalizable insight into how AI impacts broader project success measures like efficiency.

Second, the mediating factors that impact the AI–project success relationship are significantly under-researched. Even though some studies recognise the importance of AI tool usability as pivotal elements for the effective use of AI (Karamthulla et al., 2024; Taheri Khosroshahi, 2024), these factors are seldom included in rigorous quantitative frameworks. This exclusion, while introducing simplicity into the description of AI use, neglects the multilayered, complex nature of actual project ecosystems. Most of the empirical studies' available focus solely on technological factors and neglect the human components, which diminishes the frameworks' overall robustness.

Finally, there is a methodological gap concerning the use of rigorous, data-driven quantitative techniques—such as mediation regression analysis—to test theoretical relationships involving AI, human competence, and project outcomes. Without such empirical evidence, organizations and project managers lack the guidance needed to make informed decisions about AI investment, team development, and process restructuring. This research, therefore, seeks to fill these voids by examining the direct, and mediating relationships among the key variables using a validated conceptual model, thereby contributing to both academic theory and practical application.

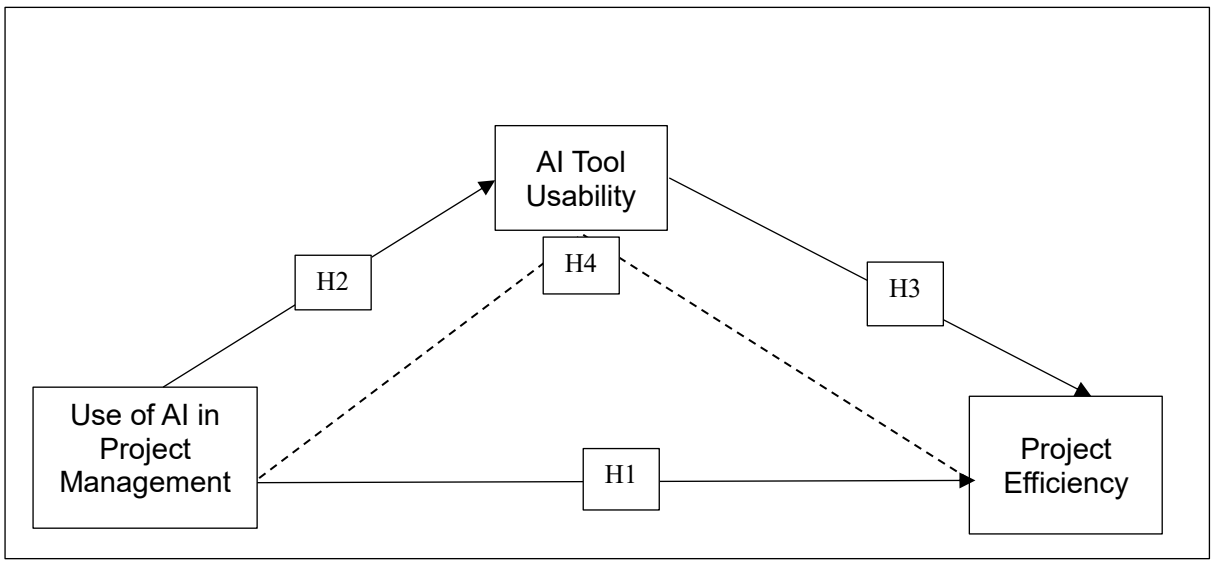
1.2.6. Conceptual Framework

The purpose of the study is based on the TAM model, which identifies the impact of adoption on effectiveness and includes the use of technology as a factor having a differential impact on the adoption of a technology. AI use is the independent variable, while project efficiency is the dependent, and AI tool usability is the mediating variable, as shown in the model. This framework reinforces the premise that the use of AI tools is not sufficient to enhance efficiency; the level of usability determines the degree of project use. This framework clarifies the impact of AI on project efficiency by treating usability as a mediating factor. Furthermore, the model is theoretically backed by TAM because the model is always supported the use adoption of technology. The summary of the variable is given as follows:

Independent variable: Use of AI in PM
Dependent variable: Project efficiency
Mediator: AI Tools Usability

Figure 1

Theoretical framework



1.2.7. Research Hypotheses

Like every other research, this research has also defined the following four hypotheses, and the aim is to verify whether these hypotheses are accepted or rejected:

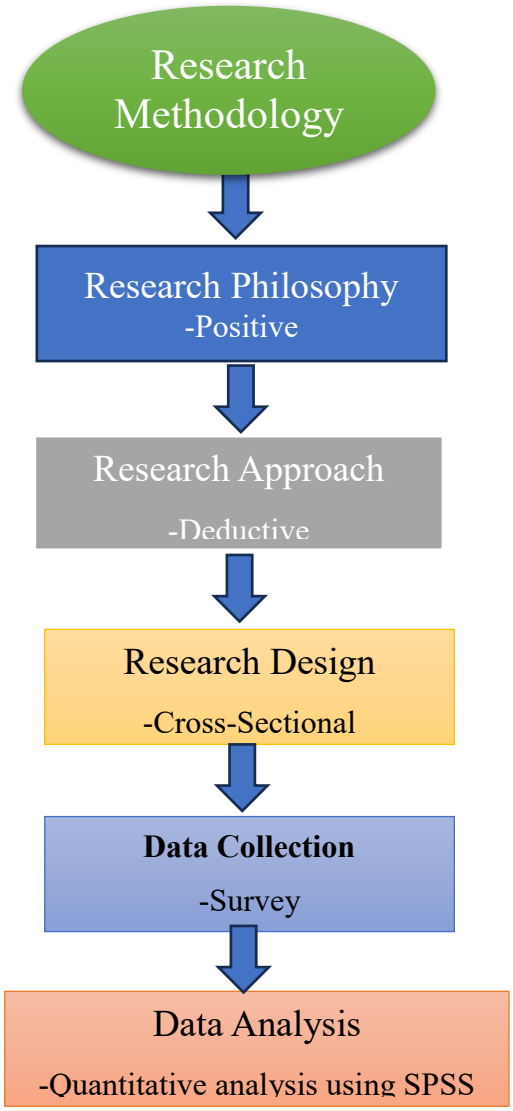
- H1. Increased use of AI has a positive impact on the project efficiency.
- H2. There is a positive relationship between use of AI and AI tool usability in PM.
- H3. AI tool usability has a positive impact on project efficiency in PM
- H4. AI tool usability mediates the relationship between AI use and project efficiency.

2. RESEARCH METHODOLOGY USED IN THIS STUDY

This chapter describes how the study investigated the impact of using artificial intelligence (AI) in project management on project efficiency primarily. It focuses on how user-friendly AI tools are as an intermediary between AI usage and project efficiency. The methodology aims to provide a solid foundation for the findings in terms of their validity, rigour, and consistency with the study's goals. Therefore, the chapter begins with an explanation of the research philosophy and approach and then elaborates on the research design, including information about the target population and sampling methods, data collection methods, and analytical methods. By providing systematic justifications for all methodological decisions, this chapter provides a transparent overview of how the data were obtained and how the conclusions were reached.

Figure 2

Research Methodology



2.1. Research Philosophy and Approach

2.1.1. Research Philosophy

The philosophy of positivism within natural and social sciences claims that reality is objective and capable of being seen, measured, and quantified (Saunders et al., 2019). Knowledge is affirmatively an outcome of observable phenomena and is problematically constructed due to a thorough lack of reliance on scientific methodologies (Mohajan, 2020). Positivism is exceedingly congruent with this study's philosophy, in which AI's impact on the outcomes of project management (project efficiency) is characterised in the novel empirical data collected from the study developed on the AI paradigm. Value-free objectivity is central to the study in which statistical methods are utilised to test the hypothesised connections between the adoption of AI, project efficiency, team competency, and project usability.

Also, positivist research is interfaced with hypothesis-led research with deductive reasoning, which fits the orientation of the methodology of the study. As the aim of the research is to establish what effects certain independent variables have on a particular dependent variable, the positivist framework is useful in structuring the approach to the causal relationships in the framework in such a way that they can be ascertained, confirmed, and validated. Collection of the data with statistical regression analysis is aimed at either affirmative or negative hypothesis testing to, thus, ascertain the generalisability and reliability of the findings (Creswell & Creswell, 2017). This philosophical approach positions the study within the context of growing quantitative research in the domain of artificial intelligence and project management and strengthens its scientific rigour.

2.1.2. Research Approach

This study takes a deductive research approach, which entails building a theoretical framework and hypotheses based on existing literature to empirically test them afterwards (Gilgun, 2019). In this case, the inductive approach is the opposite, as they develop a theory based on data. As pointed out by Bryman and Bell (2015), deductive reasoning is most often linked to positivist paradigms and quantitative research, especially in cases where there is an effort to validate existing theories or establish causal linkages between variables. In this case, the current research makes use of a deductive approach to analyse the impact of AI integration on project efficiency, considering AI tool usability as a mediator and team competence as a moderator.

Using a deductive approach makes sense because there are prior works and theory-based frameworks that posit some relationships among the factors needed to be studied (for example, Malik, 2024). This background knowledge allows for the formulation of clear-cut hypotheses regarding the direct and indirect influences of AI in the management of projects.

This study confirms or refutes these hypotheses through hypothesis testing, which is based on the statistical analysis of data collected from a structured questionnaire. Following this approach allows the research to preserve consistency throughout the study and ensures that the conclusions drawn are rational and based on sound reasoning and observed facts.

2.2. Research Design and Strategy

2.2.1. Research Design

This study employs a quantitative cross-sectional approach as it attempts to establish and measure relationships among different variables using data collected at a single moment in time. Data collection for this study was guided by a well-formulated quantitative approach. Such an approach facilitates organisation in data collection and permits analysis and reasoning to uncover trends. Subsequently, data can be used to test set hypotheses, and reliable conclusions can be drawn about the population (Creswell & Creswell, 2017). This research will employ surveys to collect information pertaining to the independent variable (AI adoption), the dependent variable (project efficiency), the mediator (AI tool usability), and the moderator (team competence). The focus of this research study justifies the use of a quantitative approach, as it aims to measure the causal relations among the variables and evaluate the impact and strength and direction of the relations among the constructs.

The cross-sectional component of the study allows the researcher to observe the current level of artificial intelligence use and the effects it has on project performance in different organisations or industries in a given moment in time. As mentioned by Saunders and colleagues in 2019, this type of design bears its own unique strengths and weaknesses. In contrast, a longitudinal design might provide insight into the evolution of some trends over time, but a cross-sectional approach is preferred for a first exploration of the issue, mostly given the constraints of time and resources in this fast-evolving area. Although failing to capture the long-term effects is a major flaw in the type of design, the cross-sectional method is appropriate in the context of formulating hypotheses and identifying patterns related to the use of artificial intelligence in project management, which provides a cost-effective data collection method.

2.2.2. Population and Sampling

The participants of this study comprise professionals, including project managers, IT managers, team members, and team leaders who have experience in interfacing with and utilising AI tools in project-based environments. This is a pertinent population because these people possess both operational and managerial-level understanding of the deployment of AI and its effect on the success of the project (Dwivedi et al., 2021). Focusing on this group

enhances the likelihood that the data reflects accurate assessments concerning the impact of AI technologies on efficiency, usability, and overall project performance.

In this instance, the non-probability sampling technique has been defined as purposive sampling in relation to the participants because of their unique interaction with AI project management systems. As noted by Etikan et al. (2016), purposive sampling is applicable whenever the researcher is interested in obtaining expert opinions and in-depth perspectives due to, as in this case, a lack of representation from the rest of the population. Considering the exploratory aspect of the AI adoption, project efficiency, usability, team competence, and relationships, this sampling technique is beneficial as it helps the researcher to obtain rich, relevant, and contextual data. Guidelines from Krejcie and Morgan (1970) will be used to set the sample size to ensure adequate statistical power and reliability for quantitative evaluation.

To include participants in the study, the following criteria will be established:(a) possession of project management experience of not less than one year, (b) working for organisations in sectors where AI technologies are heavily used (e.g., IT, engineering, or consulting), and (c) willingness to respond to a structured questionnaire. This method helps to provide valid and precise intelligence tailored to the research questions.

After adopting the scale, the survey was shared with a sample size of 100 using social media platforms such as WhatsApp, LinkedIn, Facebook, Instagram, and Twitter. The scale Is designed on Google Forms so that it can be easily shared with the targeted sample. After sharing it with targeted professionals, we collected 47 responses. Later the responses were downloaded in an Excel sheet, and data cleansing was done along with coding for open-ended questions. Fortunately, all 47 responses are as per requirements, so all responses are then transferred into SPSS for analysis of the data.

2.3. Measurement and Instrumentation

2.3.1. Operationalization of Variables

Table 1

Summary of scale structure and sources

Variable	Items	Source
Use of AI	6	Syam and Sharma (2018); Falah Alroud et al. (2025)
AI Tool Usability	6	Davis (1989)
Project Efficiency	7	Varajão et al. (2014); Serrador and Pinto (2015); Joslin and Müller (2016)

Source: Compiled by the author.

2.3.2. Instrument Design

The instrument for this study is a designed questionnaire that measures each variable as AI Adoption (independent variable), Project Efficiency (dependent variable), AI Tool Usability (mediator), and Team Competence (moderator) within the conceptual framework. The questionnaire is segmented into parts that contain several items measuring important aspects of the corresponding constructs. Responses are captured via a 5-point Likert scale from “Strongly Disagree” to “Strongly Agree”. This method is helpful in measuring attitudes and perceptions as described in Joshi et al. (2015).

An expert in the relevant field is an academic supervisor and a professional in project management; therefore, the instrument is validated for content. Defining clarity, reliability (using Cronbach’s alpha), and possible biases is tested in a pilot study with 15-20 respondents. Full-scale data collection is performed only after identified changes are made to strengthen the contextual relevance and psychometric rigour of the instrument.

Although the study primarily employed closed-ended questionnaire items for quantitative analysis, three open-ended questions were included to capture additional insights. Responses to these questions were analysed using quantitative content analysis. Common themes were identified, coded into numerical categories, and subsequently entered into SPSS for descriptive analysis.

2.4. Data Collection and Analysis

2.4.1. Data Collection Procedure

The processes in place for collecting data for this study are orderly and methodical in nature, in alignment with standard procedures in quantitative management and technology research. Information will be collected via an online self-administered questionnaire sent to participants through professional networks, LinkedIn, project management forums, and mailing lists. This approach provides a broad reach, prompt data collection, and reduced interviewer bias (Saunders et al., 2019). Respondent data will be protected, as the questionnaire will be stored in secure sites such as Google Forms, which provides confidentiality and can be easily uploaded to statistical software for analysis.

Before wide distribution, a pilot study will be carried out with 15–20 professionals who will meet the inclusion criteria. This online pilot will focus on all aspects, including question clarity, scale reliability, and overall workflow. Adjustments for increased accuracy and engagement will be based on pilot feedback, after which the final survey will be uploaded. This final survey will be available for a month, incentivised by responsive reminders. Respondents will be fully voluntary and will be briefed on the nature, time, and confidentiality measures

before engagement, ensuring ethical compliance and informed consent (Creswell & Creswell, 2017).

2.4.2. Data Analysis Techniques

After collecting the data, it will be exported to SPSS for the data cleaning, coding, and processing steps. The initial stage of analysis will include calculating some descriptive statistics which will summarise the demographic data (e.g., age, gender, role, and experience) and also give some insight into the data through calculating the mean, standard deviation, and frequency distributions. It is important to note that this stage is essential for the detection of outlier cases and the evaluation of normality, which is important for many inferential statistical techniques (Hair et al., 2019).

Measurement scales will also be evaluated for reliability, for which internal consistency will be evaluated using Cronbach's alpha with a threshold value of 0.70 acceptable for research purposes (Taber 2018). Also, descriptive statistics such as mean, standard deviation, skewness, and kurtosis will be calculated to examine the data and its composition as well as its distribution to understand its nature. The results of these calculations will assist the detection of the central value, the degree of dispersion, and the presence, or degree of deviation from normality (Kaur et al., 2018; Field, 2024).

For testing the hypotheses, the relationships among variables, especially the impact of AI adoption on project efficiency, will be analysed using linear regression. AI adoption's impact on project efficiency can be objectively analysed with linear regression, as the analytical method offers the capability to assess the strength and significance of relationships between primary and secondary outcomes (Field, 2024). Prior to analysis, the linear regression assumptions of normality, linearity, homoscedasticity, and lack of multicollinearity will be confirmed. In situations where some of these assumptions are not met, suitable transformations to the data or the adoption of robust regression methods will be implemented (Meuleman et al., 2015).

To test the mediation effect of AI Tool Usability, the bootstrapping method (5,000 resamples) will be used to estimate the indirect effects and confidence intervals, following the guidelines of Preacher and Hayes (2008). A significant indirect path with a non-zero confidence interval will confirm mediation. For moderation analysis, interaction terms will be computed, and hierarchical regression or multi-group analysis will be applied, depending on the analytical technique used. These tests will determine whether the strength or direction of the relationship between AI Adoption and Project Efficiency changes based on the level of Team Competence (Aiken et el., 1991).

Steps in the Data Analysis Procedure

Before analysis, the author cleaned and organized data so that it can be incorporated into SPSS. The steps carried out:

- **Data cleaning**: Mindful and thorough checking for missing, inconsistent, and erroneous data was done. After that some correcting work was done, and finally some irrelevant material was also removed.
- **Data coding:** Responses to closed-ended questions were converted into 1 (strongly disagree) to 5 (strongly agree) numbers. Further, responses to open-ended questions were coded into 8 categories (1 to 8 numbers) so that descriptive analysis can be done for supporting quantitative analysis.
- **Data entry:** The cleaned and structured data was then entered into SPSS software for analysis, and demographic, reliability, descriptive, correlation, and regression analyses were carried out.

2.5. Ethical Considerations

This research adheres strictly to ethical standards as outlined by the British Psychological Society (BPS, 2018) and the university's research ethics committee. Ethical clearance will be obtained prior to data collection, and all participants will be provided with an informed consent form detailing the study’s purpose, the voluntary nature of participation, confidentiality measures, and the right to withdraw at any point without penalty. No personally identifiable information will be collected, ensuring participant anonymity and data privacy.

All data will be stored securely on password-protected devices, and access will be restricted to the principal researcher and supervisory team. Data will be used solely for academic purposes and will be destroyed after a specified retention period in accordance with GDPR regulations (Politou et al., 2021). No deception or coercion will be used, and the language in the questionnaire will be neutral and non-leading to avoid response bias. These steps ensure that the study maintains the highest ethical standards while protecting the rights and well-being of its participants.

3. ANALYSIS AND DISCUSSION

A complete analysis of the empirical data gathered from participants is contained in this chapter, as well as the attempts made to achieve the research objectives and verify all the hypotheses set out in Chapter 1. These findings will be carefully evaluated and examined to clarify how AI usage in project management, the usability of AI tools, and project efficiency are all connected. To help translate the quantitative results of the research into meaningful insights and ultimately demonstrate how AI contributes positively to improving efficiency in the project management sector, appropriate statistical analysis was performed in this chapter.

This chapter provides a logical sequence of the data analysis results to their interpretation and application. The chapter commences with a summary of the methods used in the analysis and the results obtained from it. After that, it will go into greater detail by discussing how these results relate to the relevant literature and theoretical foundations. After providing a summary of the study, the chapter will provide recommendations to assist organizations in utilizing AI tools to improve the efficiency of their projects based upon the findings of this research study. The chapter will also provide reflections on the contributions made by this study and conclusions drawn from its results.

3.1. Data Analysis of collected data

3.1.1. Demographic analysis

The demographic data collected from participants includes their personal demographic characteristics (gender, age, and education), role in the company, and years of experience in the industry. A summary of demographic characteristics is provided in the following table.

Table 2

Respondent's Demographic Distribution

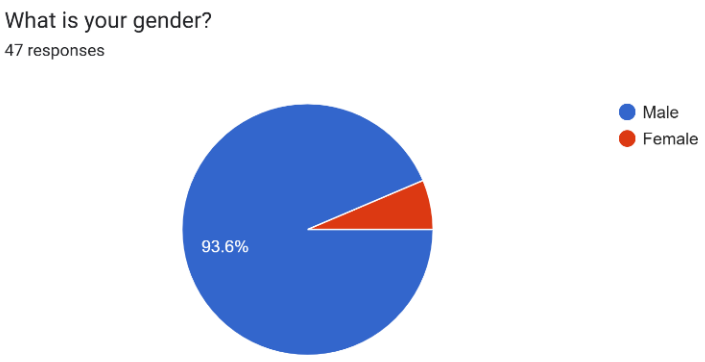
Variable	Characteristics	Frequency	Percent
Gender	Male	44	93.6
	Female	3	6.4
	Total	**47**	**100.0**
Age	18-24 Years	7	14.9
	25-34 Years	31	66.0
	35-44 Years	9	19.1
	Total	**47**	**100.0**

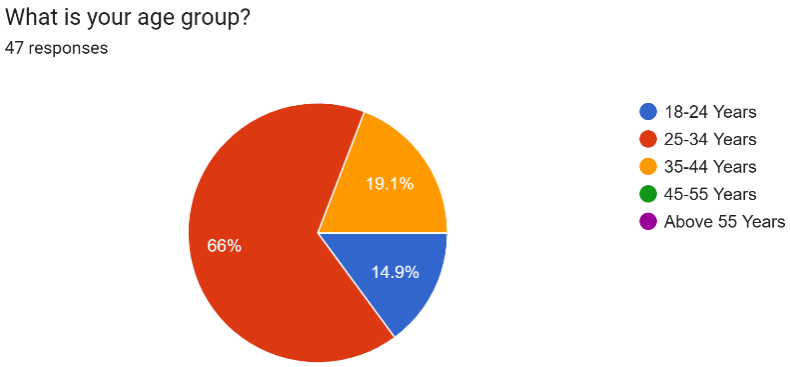
Continuation of Table 2

Education	Secondary School	2	4.3
	Bachelor's	23	48.9
	Master's	22	46.8
	Total	**47**	**100.0**
Role in company	Project Manager	11	23.4
	Team Leader	12	25.5
	IT/AI Specialist	12	25.5
	Team Member	12	25.5
	Total	**47**	**100**
Years of Experience	1-3 Years	7	14.9
	4-5 Years	11	23.4
	6-7 Years	6	12.8
	8-9 Years	8	17.0
	Above 9 Years	15	31.9
	Total	**47**	**100**

Source: Compiled by the author.

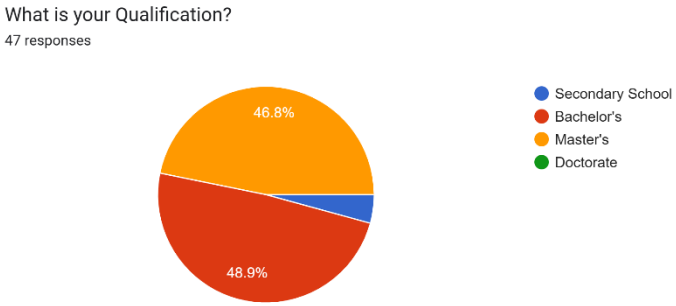
The sample in this study is predominantly male (93.6% male, 6.4% female). This is due to the fact that most openings in emerging economies in technology, project management, and engineering witness a gender inequity, which is supported by societal structural barriers and socio-cultural norms.

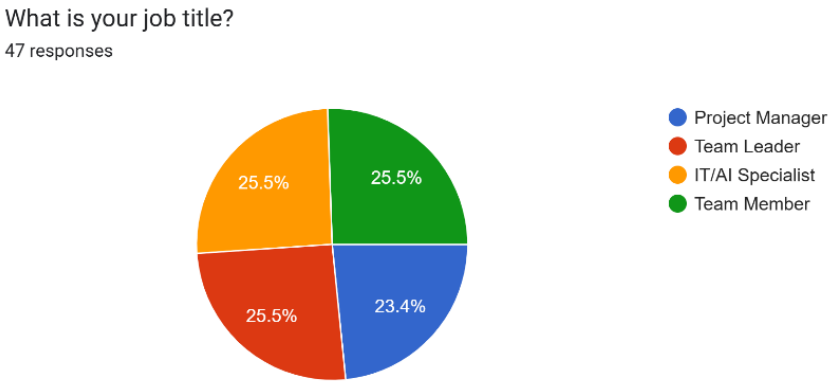




Regarding the respondents' ages, most respondents are between 25 and 34 years old (66.0%), with 19.1% being 35-44 and 14.9% being 18-24. This indicates that the great majority of those surveyed are in the early phases of their mid-career. This reason is important because younger workers in developing countries tend to have more exposure to emerging technologies such as AI (Venkatesh et al., 2012).

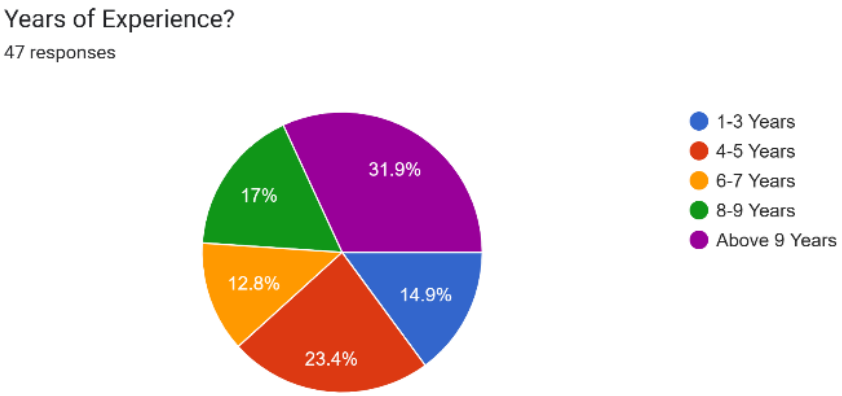
Thirdly, educational background of respondents is also analysed using the descriptives and frequencies. With 48.9% of the sample holding a bachelor's degree and 46.8% holding a master's degree, the majority of respondents had comparatively high levels of educational attainment. Previous research has shown that higher levels of education positively impact the adoption of technology and the use of technology systems (Davis, 1989a, 1989b; Dwivedi et al., 2021).





The data showed that the participants representing the following positions were fairly evenly represented as project managers (23.4%), team leaders (25.5%), IT/AI specialists (25.5%), and team members (25.5%). The distribution of participants among these roles provides a strong basis for the findings, as it offers information from both a strategic perspective and an operational perspective for AI-supported project activities (Joslin & Müller, 2016).

Additionally, many respondents reported extensive experience in the workforce; specifically, 31.9% of respondents stated they have over nine years' experience, 23.4% indicated they have 4 to 5 years of experience, and 17% indicated they have 8 to 9 years of experience. Since the majority of participants in the survey had at least one year of prior work experience, they were able to provide a more detailed perspective on the effect AI has had on project efficiency, and their ability to evaluate its impact was further enhanced due to their long-term engagement (Serrador & Pinto, 2015; Varajão et al., 2017).



3.1.2. Reliability Analysis

The reliability analysis measures an instrument's (or survey scale's) ability to be internally reliable by checking the correlation of the items that are supposed to measure the same construct. Cronbach's alpha (α), which is a commonly used reliability coefficient, indicates how consistently the multiple items measure the same construct; therefore, an alpha of 0 is a perfect score, and an alpha of 1 is nonsensical (Hajjar, 2018). Generally speaking, the higher the value of an alpha, the more consistently the items measure the same underlying construct. For example, Cronbach's alpha is viewed as acceptable in social sciences when it exceeds 0.70; however, many researchers encourage a score of 0.80 or higher for stronger evidence of consistent reliability. The context and construct of interest will determine how one should interpret the alphas. For the estimates of reliability to be reliable, the items measuring the scale must be conceptually related; in addition, the errors of abstraction associated with a scale must not be dependent (Salmond, 2008). Violating these assumptions will lead to inaccurate and potentially misleading estimates of reliability. Researchers frequently report their alphas to demonstrate sufficient reliability prior to conducting further hypothesis testing for constructs of interest, such as perceptions and attitudes.

Table 3

Scales's Reliability

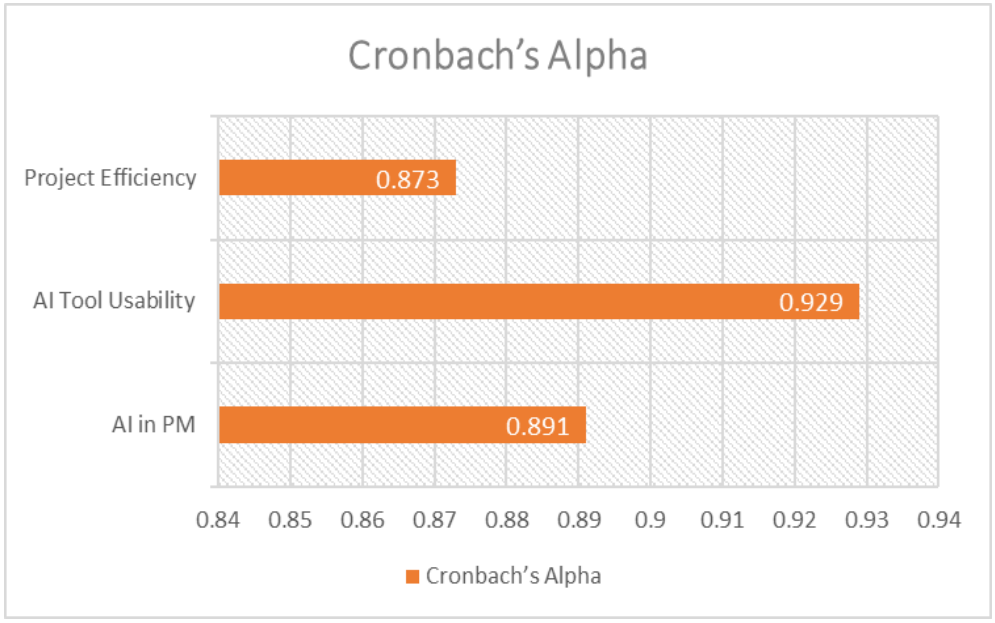
Scale	No of Items	Cronbach's Alpha
AI in PM	6	0.891
AI Tool Usability	6	0.929
Project Efficiency	7	0.873

Source: Compiled by the author.

The internal consistency of the item list used for measurement in this study has been confirmed as being very good through reliability statistics analysis. The AI in the project management scale has a Cronbach's alpha of 0.891, based on six items, and indicates a strong degree of reliability (high consistency) across the six items. The Usability of AI Tools scale also had very high internal consistency with a Cronbach's alpha of 0.929, based on six items. Additionally, the Project Efficiency scale had seven items and a high reliability coefficient of 0.873. All of these values demonstrate very good reliability, as they exceed the common threshold of 0.70; therefore, each of the scales can be confidently used for additional statistical analyses (Taber, 2018). The values of Cronbach's alpha suggest that survey is reliable and the data collected is valid and reliable so the author should process with further steps of data analysis processes.

Figure 3

Cronbach's alpha value



Source: Compiled by the author.

3.1.3. Correlation Analysis

Correlation analysis is a means of quantitatively determining how well two continuous, independent variables relate to each other. The Pearson correlation coefficient, denoted by the letter "r," is the most widely used correlation analysis statistic (Franzese & Iuliano, 2018). The value of "r" can range from -1 to +1. If the "r" value is close to +1, there is a very strong positive correlation between the independent and dependent variables, which means that when one variable increases, the other variable also increases. If the "r" value is close to -1, then this means there is a very strong negative correlation between the independent and dependent variables, which means that when one variable increases, the other variable decreases. If the "r" value is around 0, there is no linear relationship between the two variables. Even when there is a strong correlation, this does not mean that the independent variable causes the dependent variable to change. The assumptions for performing Pearson correlation analysis are a linear relationship between the two continuous variables being measured, continuous measurement of both independent and dependent variables, and at least approximate normal distribution of both the independent and dependent variables (Zou et al., 2003). If any of these assumptions are not met, a more appropriate correlation analysis statistic would be Spearman's rank correlation. Frequently, correlation analysis is performed prior to testing more complicated models to investigate the correlation between constructs (e.g., between leadership styles and efficiencies).

Table 4

Correlation between variables

Variables		AI in PM	AI tool usability	Project efficiency
AI in PM	Pearson Correlation	1	.553**	.703**
AI tool usability			1	.770**
Project efficiency				1

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

Source: Compiled by the author.

AI in PM and AI Tools Usability

The results of the initial correlation of variables suggest that there is a moderate to strong positive correlation ($r = 0.553$, $p < 0.01$) between the use of AI in project management and AI tool usability. This indicates that the more frequently AI is used in project management

operations, the greater the perception of AI tool usability. This analysis of the data confirms that there is a highly positive relationship between the use of AI within projects and employees' perception of how easy it is to use an AI-based tool for project work. This finding suggests that if employees frequently use AI tools in major tasks, such as creating a project plan, creating project schedules, generating project status reports, and tracking project progress, they will be more comfortable using AI tools and therefore more likely to use them. When working in project environments where there are many opportunities for regular use of AI tools, employees become better acquainted with how the AI tools operate, the responses they produce, and their capabilities and limitations, which further strengthens their ability to communicate and work effectively with them.

An empirical study conducted by Dwivedi et al. (2021) suggests that the continuous and meaningful use of AI systems leads to a learning effect that ultimately improves perceptions of usability over time when they are integrated into daily workflows and used frequently, as opposed to infrequently. Also, the research conducted by Babar et al. (2025) identified that employees participating in projects that used AI technology reported valuing their experiences with AI significantly higher due to increased familiarity, decreased cognitive load, and alignment of AI features to project requirements. Combined, the results of these studies highlight that the usability aspect of an AI resource is both a function of design and an outcome based on the extent and depth of use of the system within project management practices.

AI in PM and AI Tools Usability

In addition, there is a strong correlation ($r = 0.703$, $p < 0.01$) between AI in project management and project efficiency, indicating that increased use of AI is closely tied to an increase in project efficiency. According to this correlation analysis, higher levels of AI integration in project management result in greater project efficiency. Consequently, projects that incorporate AI technology into their operations will tend to exhibit higher levels of efficiency. In other words, the implementation of AI in project management enhances an organisation's ability to implement tasks more effectively, enabling teams to respond quickly and efficiently to challenges as they arise. From a data analytics perspective, AI improves a manager's ability to make informed decisions quickly and accurately, which in turn contributes to improvements in a project's use of time, resources, and coordination of activities (Zidane & Olsson, 2017; Nama, 2022).

As well as being consistent with the positive correlation observed here, studies investigating how organisations' use of AI-enabled project environments support improved project performance have also provided evidence for a positive correlation between AI

adoption in project management and improvements in efficiency. For example, Nabeel (2024) provides evidence from his research that organisations that use AI-based project management tools improve their workflow efficiency and enhance their ability to control their performance against project performance metrics. Furthermore, Zidane and Olsson (2017) state that intelligent systems facilitate proactive project management by providing early identification of deviations from plan and enabling prompt corrective actions, which are necessary for effective implementation of projects. Collectively, these studies provide empirical evidence that AI adoption improves efficiency outcomes for project management, thereby supporting the proposed relationship tested in this study.

AI Tools Usability and PM Efficiency

The correlation between the third pair highlights that there is a strongest correlation ($r = 0.770$, $p < 0.01$) between AI tool usability and project efficiency. It demonstrates that ventures tend to be more efficient when AI tools are perceived by workforces as intuitive, easy to use, and well-integrated into their work procedures. The evidence from this research shows that usability is a key factor for the success of project teams in AI-supported decision-making, project execution, and project monitoring activities. Specifically, when employees can use AI tools with minimal mental load or effort, they have the ability to execute more quickly and effectively without distractions from complex interface designs. These findings also substantiate the claims made by Davis (1989) and Venkatesh and Davis (2000), who found that perceived ease of use was the primary driver for increased performance on tasks and increased efficiencies.

Various empirical studies published in the literature on project and information systems demonstrate that factors related to usability have a direct impact on the resulting performance of technology-enabled projects. For example, Ajani et al. (2020) showed that intelligent systems with higher levels of usability have led to increased efficiency in the delivery of projects due to greater user involvement and fewer errors related to the use of these systems. Likewise, Paul et al. (2023) demonstrated that the use of digital tools developed using user-centred design principles results in greater efficiency and better decisions made by project-based organisations. Thus, the evidence supports the conclusion that the benefits in terms of increased efficiency of AI technologies in managing projects are predicated upon the degree to which the tools used by employees are usable. Therefore, in order to attain the maximum benefit of AI-reliant project performance, usability must be considered an important factor.

Thus, it is concluded that the success of using an AI tool for project management largely depends on the usability of that tool. In summary, significant correlations were found in this study, indicating that AI tool usability may play a pivotal role in improving project efficiency.

3.1.4. Descriptive analysis

The term "descriptive analysis" refers to statistical methodologies used to summarize and describe the fundamental aspects of a dataset, without drawing conclusions about the entire population based on that sample (Alem, 2020). Examples include computing central tendencies such as means (averages) and measures of variability (standard deviations). Measures of central tendency provide insight into the "average" response, while measures of variability give an idea of how responses differ between participants. Descriptive statistics serve as a basis for presenting research, as they provide a comprehensive overview of the dataset, including minimum and maximum values, and are often used to verify underlying assumptions of normality prior to performing inferential analyses (Baffoe-Djan & Smith, 2019). Descriptive analyses do not hypothesize about relationships or effects within the population; instead, they are merely descriptive of the data gathered from within a sample. Providing descriptive statistics is an important first step when reporting research findings, allowing researchers to explain how participants responded, as well as identify any unusual or unexpected patterns in the data.

In this research the coded open-ended responses were analysed using descriptive distributions to identify the most commonly reported impacts, use cases, and challenges associated with the use of AI in project efficiency. The results of descriptive analysis are presented in mean and standard deviation along with minimum and maximum values.

Table 5

Descriptive analysis of coded open-ended questions

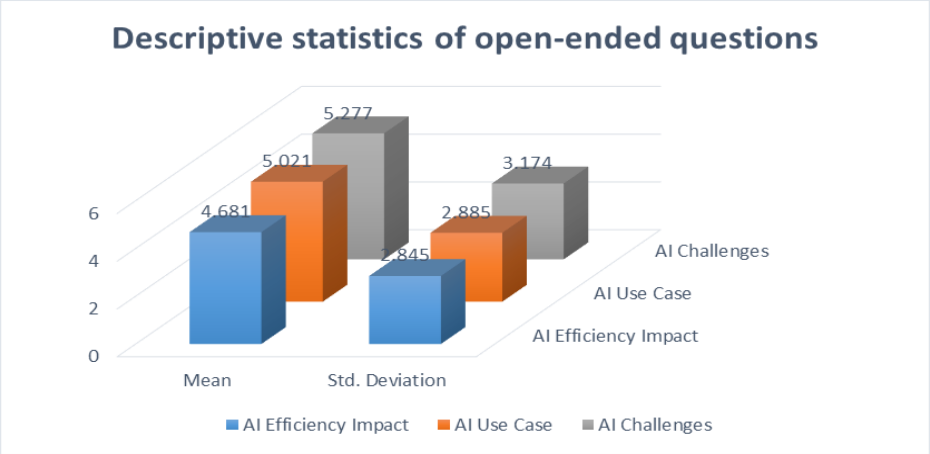
Themes	N	Minimum	Maximum	Mean	Std. Deviation
AI Efficiency Impact	47	1.00	8.00	4.681	2.845
AI Use Case	47	1.00	8.00	5.021	2.885
AI Challenges	47	1.00	8.00	5.277	3.174

Source: Compiled by the author.

The descriptive analysis of the open-ended responses suggests that respondents generally have a positive opinion regarding using AI to improve project efficiency. But, at the same time, the respondents have witnessed several challenges associated with using AI in PM. The question related to the impact of AI efficiency on PM has an average mean score of 4.68 (SD = 2.84), indicating that respondents overall believe to have a moderate to very high level of perceived impact of AI on improving overall project efficiency.

Figure 4

Descriptive statistics of open-ended questions



Source: Compiled by the author.

The question regarding AI Use Case (representing respondents' identification of represented cases where the AI positively affected project efficiency) has a slightly greater average mean of 5.02 (SD = 2.89), indicating that the vast majority of respondents have seen or felt tangible efficiency benefits from using AI on actual projects.

Conversely, the challenges associated with AI (AI Challenges) have the highest average mean score of 5.28 (SD = 3.17), showing that, as much as respondents acknowledged their perceived benefits from using AI on projects, they also identified significant challenges that would limit the effectiveness of AI in fully improving project efficiency.

3.1.5. Regression Analysis

The process of regression analysis determines whether any theories related to an outcome may be accurate. The most basic form of regression is called linear regression, which plots all of the changes in the independent variable and how they relate to the change of the dependent variable (Gogtay et al., 2017). A regression equation contains the slope of the line plotted and its intercept. Regression provides researchers with a means to determine both the strength of a relationship (correlation) and its direction (regression). Researchers may also use regression analysis to determine statistically whether the evidence supports the independent effect of one or more of the independent variables on the dependent variable. To conduct a valid regression analysis, researchers must meet the following criteria: the relationship between the independent and dependent variables is linear, the sample observations are independent of each other, the residuals are normally distributed, and there is homogeneity of variance (constant variance of residuals). Violating any of these criteria may

produce biased or misleading estimates (Gogtay et al., 2017). In the regression output, a coefficient indicates the degree to which a particular predictor variable is expected to influence the outcome variable for every one-unit increase in that predictor variable, while the p-value indicates whether those changes are statistically significant and are likely to occur due to random sampling variability. In hypothesis testing, when the goal is to estimate and quantify the degree to which predictors relate to the outcome variable (rather than simply describing), one of the most important uses of regression analysis is the identification of predictive relationships.

Table 6

Regression analysis results

S/N	IV	DV	Coefficient (β)	R^2	t-value	p-value
H1	AI in PM	PE	0.543	0.494	6.631	< 0.001
H2	AI in PM	AI Tool Usability	0.468	0.306	4.457	< 0.001
H3	AI Tool Usability	PE	0.703	0.593	8.091	< 0.001

Source: Compiled by the author.

The regression outcomes offer strong pragmatic support for H1, confirming that the use of AI in project management has a noteworthy and constructive influence on project efficiency. The standardized coefficient (β = 0.543) shows a moderate to strong effect, signifying that higher levels of AI use are connected with evocative progresses in project efficiency. The model describes 49.4 per cent of the variance ($R^2 = 0.494$) in project efficiency, which is significant for organizational and behavioural study. The high t-value (t = 6.631) and a p-value below 0.001 further validate that this association is statistically vigorous and improbable to have happened by casual. These outcomes designate that AI-empowered actions such as prognostic analytics, automated forecast, and actual performance monitoring play an important role in increasing efficiency in project accomplishment.

From an analytical point of view, AI can be viewed as a primary empowering force for efficient project management; in contrast, AI is typically viewed as an auxiliary tool or technology for project managers. As noted in the report, AI also enhances project management by improving the accuracy of decisions made, accelerating decision-making, and minimizing delays by optimizing the use of resources. Thus, AI supports the growing body

of literature on project management that focuses on the use of data and intelligent systems to assist project managers in managing their projects more effectively. As the model's high degree of explanatory power indicates, the use of AI is a fundamental component of the efficiency improvements in today's project environments. Furthermore, the empirical data from our study support our recommendation that businesses should implement AI in a systematic and integrated way in all aspects of project management to improve project efficiency, rather than experimenting with or using AI in an isolated manner.

The findings of this research strongly support Hypothesis 2 (H2), which states that when AI is applied to project management, it has a noticeably large positive impact on the perceived usability of AI tools (usability). The standardised beta coefficient indicates that the increased application and integration of AI technology in relation to project management will positively impact (to the highest degree) the user experience (UX) of AI tools ($\beta = 0.468$; $R^2 = 0.306$; $t = 4.457$; $p < 0.001$), therefore creating a greater perception of how usable an AI tool is when applied or used within a project management setting. The R-squared value demonstrates that 30.6% of the variance associated with the usability of AI tools can be explained by the proposed model, making it a moderately strong study within the field of organisational and technology adoption studies. Lastly, through statistical analysis of the relationship between AI usage and usability of AI tools, it was determined that the t-value (4.457) and p-value (<0.001) were significant to a level indicating additional confidence in the degree to which the relationship is robust. Increased use of artificial intelligence in project management has a direct correlation to ease of use, clear understanding, and practical application of AI tools within project management settings.

As a result of these findings, it is indicated that a user's experience with an AI tool is not only determined by the design of that tool but also depends on how well integrated the AI tool is into an employee's daily project management practices. As employees gain more experience in using an AI support tool, they typically tend to have greater levels of familiarity, confidence, and competence, which diminishes their perception of the AI tool's complexity and improves their perceptions about the tool's usability. These findings are consistent with technology acceptance theories that indicate the more frequently and the better a person utilizes a specific type of technology, the more likely that individual will view that technology as easy to use over time. Based on these observations, it can be inferred that an organization can improve the usability for employees who use AI tools by not only designing and implementing those tools but also encouraging employees to utilize those tools consistently via their project workflows and through the provision of training and organizational support mechanisms.

The results associated with H3 indicate that the relationship between AI tool usability and project efficiency is strong and positive ($\beta = 0.703$; $R^2 = 0.593$; $t = 8.091$; $p < 0.001$). AI tool usability accounts for a significant proportion of the variance in project efficiency. All of these results provide substantial empirical evidence to support the proposed hypotheses and to emphasize the importance of AI tool usability in enhancing project efficiency. Analytic results suggest that the effectiveness of AI as a tool to support efficient project processing is driven primarily by the perception of usability by the employee. If advanced AI tools are perceived to have a degree of complexity and a lack of user-friendliness and are difficult to incorporate within daily project activities, then it stands to reason that employees would not derive the benefit of increased efficiency from using an AI tool. This model has strong explanatory power that demonstrates the positive impacts of usability in terms of improved decision-making, completing tasks at an increased speed, and the ability for project teams to apply insights generated from AI in a systematic way. Thus, it can be concluded that usability represents a primary mechanism for transforming the capability of AI into increased efficiencies and reinforces the investor's strategic importance in undertaking an AI project management endeavour.

3.1.6. Mediation analysis

The purpose of mediation analysis is to help quantify the mechanism of effect for the relationship between an independent variable (X), a dependent variable (Y), and a mediator (M) rather than simply measuring whether or not the relationship exists. The traditional method for testing the mediation effect (Baron & Kenny, 1986) includes the following three hypotheses: 1) Independent Variable (X) significantly predicts Dependent Variable (Y); 2) Independent Variable (X) significantly predicts Mediator Variable (M); 3) Mediator Variable (M) significantly predicts Dependent Variable (Y); and 4)a) when Mediator Variable (M) is included in the regression model, the effect of Independent Variable (X) on Dependent Variable (Y) decreases, establishing a portion of the effect of Independent Variable (X) on Dependent Variable (Y) is mediated through Mediator Variable (M); b) and present all testable or statistical evidence in relation to hypotheses through performing either a Sobel Test or Bootstrapping method for testing for significance of the indirect (Mediated) effect. Mediation models are helpful in clarifying the pathways of direct and indirect effects and have been applied within a more advanced framework of causal inference within the social sciences.

Table 7

Results of mediation *analysis*

Effect Type	Path	Effect	SE	t-value	p-value	LLCI	ULCI
Total Effect	AI in PM → Project Efficiency	0.542	0.082	6.63	< 0.001	0.378	0.707
Direct Effect	AI in PM → Project Efficiency	0.308	0.076	4.05	< 0.001	0.156	0.462
Indirect Effect	AI in PM → AI Tool Usability → Project Efficiency	0.234	0.082	—	—	0.111	0.431

Source: Compiled by the author.

The mediation analysis in this study reveals that the usability of AI tools partially mediates the relationship between the use of AI in project management and increased project efficiency. The overall influence of AI in project management on project performance demonstrates a positive and significant correlation ($b = 0.5425$, $p < 0.001$), indicating that greater use of AI will improve project performance. However, by including the usability of the AI tool in the mediation model, the impact decreases ($b = 0.3081$, $p < 0.001$), but the direct relationship still maintains a high level of statistical significance, indicating some level of mediation. Additionally, there is also a significant indirect effect from the usability of AI tools ($b = 0.2344$), which was supported by the bootstrapped confidence interval that does not cross zero (LLCI = 0.1112; ULCI = 0.4307). Therefore, it is proposed that the usability of the AI tool will improve project performance through mediation.

While AI adoption in project management provides direct benefits by increasing project efficiency, a significant part of its overall impact can be attributed to employees' beliefs about the usability of AI tools. The use of a mediator has reduced both the direct impact and the influence of the AI-driven efficiencies, indicating that the AI-driven efficiency is not simply dependent on technological capabilities. Employees must feel comfortable using AI tools if they are to derive maximum benefit from them within their project-related activities. This finding illustrates the importance of usability as a facilitator that will maximise the effectiveness of the integration of AI systems into the daily flows of project work.

The significant indirect effect also highlights how crucial usability is for creating measurable performance results from AI usage. Employees are more inclined to work with these kinds of applications on a continuous basis when they see them as being simple to use, trustworthy, and helpful relative to their requirements. Increased employee use of the AI

applications enables employees to use insights from these applications in their planning processes, coordinate tasks with others, and make decisions. Increased employee use of AI applications lowers the amount of effort needed for a task to be completed (cognitive load), decreases the number of errors made during task performance, and improves the speed at which tasks are completed. Together, these three benefits produce greater overall project efficiency. As a result, investing in AI technology alone will not maximise its overall benefit unless there is a corresponding emphasis on designing for the user and implementing for usability.

The theoretical basis behind the partial mediation effect observed in this research supports the TAM, which maintains that perceived ease-of-use will have a positive impact on how users utilise technology to achieve performance outcomes. Usability serves to connect the use of AI with greater efficiencies in projects through user behaviours and the usage of AI tools; however, there remains a substantial direct effect of AI on project efficiency, suggesting that the automations and advanced analytics associated with AI can also improve project efficiency apart from usability. As such, the resultant understanding of the results of this research enhances our knowledge of the various ways that usability is an important link between using AI and achieving greater efficiency in projects, but not the only link.

The results of mediation analysis suggest that organisations should focus on employees' positive experience with AI tools before completely and officially adopting them into the work processes. When employees feel that the tools that they are using are not difficult to use and that they are meant to increase their working efficiency, then they will definitely add to the overall efficiency of the organisation, which will lead to a sustainable competitive edge in the market.

3.2. Summary of Hypotheses

Below is the summary of proposed hypotheses and relevant actions to be taken after analysis of the data:

Table 8

Summary of hypotheses

S/N	Hypothesis	Action
H1	IA in Project Management -> Project Efficiency	Accepted
H2	IA in Project Management -> AI Tool Usability	Accepted
H3	AI Tool Usability -> Project Efficiency	Accepted
H4	IA in Project Management -> AI Tool Usability -> Project Efficiency	Accepted

Source: Compiled by the author.

3.3. Discussion on results with respect to existing literature

This study aimed to identify how AI can support project efficiency, specifically through the use of AI tools. The support provided by the research findings was strong, with empirical evidence supporting the conceptual model and hypotheses. The findings confirm that the inclusion of AI in project management results in increased efficiency in projects. There is also substantial consistency between the current findings and previous work that has established improved scheduling accuracy, quicker decision-making, and more effective resource usage in project environments using AI (Zidane & Olsson, 2017; Nama, 2022; Nabeel, 2024). The regression results have identified the significant explanatory power associated with AI as an enabling technology and elevated its status from an adjunct to a primary factor for increasing efficiency in modern project management.

Also, this study found that there is a strong positive correlation between the use of AI tools and the perception of AI tool usability. Exposure to and integrating AI systems into daily workflows improves employee perceptions of the tools' ease of use and effectiveness. Prior research also supported this finding through recognition of the role of familiarity, interaction, and integration on usability perceptions (Dwivedi et al., 2021). In addition, recent empirical studies have found that businesses actively engaging with AI technology make investments in better system design, training, and user support, resulting in increased usability (Babar et al., 2025; Robert & Sudarsanan, 2025). The results of this study support the view that usability is a characteristic developed through usage and through learning at the organizational level rather than the view that it is purely a design characteristic.

The findings additionally demonstrate that usability serves as a major driver of an organization's ability to use an AI system effectively and efficiently, thus resulting in the most positive impact on project performance. Accessibility of AI tools is an important factor in how quickly and effectively they can be integrated into daily workflows for employees, therefore reducing complexity in completing tasks while speeding up the execution of those tasks. This aligns with previous research demonstrating that usability significantly impacts productivity and effectiveness on a broad scale (Ajani et al., 2020; Paul et al., 2023). More recent research has also substantiated that enhanced usability improves user engagement, thereby reducing the amount of friction in the operation and improving overall performance at the project level (Kozhakhmetova et al., 2024; Dwivedi et al., 2021).

The mediation analysis provided empirical support for the existence of a partial mediator of the relationship between AI usage and the efficiency of a project using AI tools. The results of this analysis indicate that AI usage improves efficiency, even as AI tools enhance the user experience. The results support earlier research indicating that the user

experience, usability, and the ability to interpret systems may be the fundamental mechanisms whereby AI enables organizations to become more efficient in their use of AI-based technology (Almogren et al., 2024; Virvou, 2023). Many of the earlier studies have identified similar mediating effects between organizations and their use of AI technology on performance (Namoun et al., 2024; Sakpere et al., 2024). Collectively, these findings expand the current knowledge base by providing reliable empirical evidence that usability is a primary explanatory factor for AI-enhanced efficiency in project implementation within developing countries.

The results of this research provide support for the hypotheses proposed in this study and also demonstrate the importance of the Technology Acceptance Model (TAM) in understanding the impact of AI on performance in project management. Specifically, within the TAM framework, the use of usability of AI tools as both a direct predictor of project efficiency and as a mediating factor aligns with TAM's assertion that ease of use affects both how much a system is utilized and performance (Davis, 1989a). In other words, simply incorporating AI into a project will not ensure that the project becomes more efficient unless users perceive the AI system to be intuitive and to facilitate their work processes. This study supports the TAM model by demonstrating that TAM can be applied to understand post-acceptance efficiency of AI in complex project environments.

Another important contribution of this study is its contextual focus on project management in a developing economy, which offers a unique insight into how AI-based efficiency improves efficiency in project management in resource-limited environments. The results demonstrate that while there may be different levels of technological infrastructure and AI readiness, the usability of AI will significantly impact project management efficiency in these settings. The study's findings also include evidence that organizational and contextual variables (including systems' ability to be trained, customized, and supported by management) also impact the effectiveness of AI in project management. This aligns with recent studies indicating that additional context-sensitive strategies for implementing AI (especially in emerging markets) are required to realize efficiency improvements in these settings (Namoun et al., 2024; Sakpere et al., 2024). Consequently, this study adds to the existing research literature by providing empirical evidence of AI usage in project management in a developing country's context and thereby contributing to the increasing breadth of the generalizability of AI utilization and usability research to project management.

CONCLUSION AND RECOMMENDATIONS

Conclusion

This research investigates how AI can improve project management, specifically by studying how AI tool usability mediates this improvement. The results demonstrate that there is strong empirical evidence that using AI in project management significantly improves project efficiency, as AI-based systems enable better planning, decision-making, and execution of project-related activities. Additionally, the results indicate that as the level of use of AI increases, employees' perceptions of AI tool usability become more positive, indicating the need for continued practical engagement and integration of AI tools into their daily work life to create a positive experience for users of AI tools.

Most significantly, the study determines that the usability of AI tools is a key determinant of how users leverage Artificial Intelligence for increased project efficiency. Mediating analyses reveal that the existing relationship between AI adoption and project efficiency is primarily due to the relationship found between AI tool usability and project efficiency. Therefore, organizations must invest in user-cantered design, training, and system support to achieve the greatest increase in project efficiency for organizations using AI. In summary, the study supports both theoretical and practical purposes, demonstrating support for the Technology Acceptance Model within the context of project management and providing empirical evidence to assist organizations when implementing AI.

Implications and Recommendations

Findings from the research represent both a theoretical and practical contribution related to the effective use of artificial intelligence in project management. From a theoretical standpoint, the findings extend the TAM by establishing not only the initial adoption of new technology but also its effect on performance results, for instance, project time savings. The supported evidence of AI tool usability as a pathway to AI tool usage impacting project success illustrates usability as a vital pathway that provides greater clarity to users of AI in project management literature than previous research has suggested. This research expands our understanding of how users' perceptions influence, through their combined experience with system characteristics, the successful implementation of AI tools in project management.

The findings of this study suggest viable recommendations that will help organizations improve their project's productivity with artificial intelligence. As managers or decision-makers, if organizations are only using AI tools to gain efficiencies, they will never achieve this without actually focusing on the use of effective AI tools. Therefore, organizations should consider implementing User-Cantered Systems Thinking (UCST), User-Friendly Interfaces (UFI), and Continuous Training for Employees to increase the time employees feel comfortable and

familiar with using AI systems. When employees feel comfortable and familiar with AI systems, it is likely that their productivity will increase, leading to shorter project timelines and higher levels of project performance through improved coordination and better quality of project decision-making.

Based on these findings, several recommendations are proposed:

- **Enhancing Usability through Employee-Centred AI Design:** By using the research, organizations should engage employees through user testing and feedback during the implementation phases of AI development as part of a better user experience with AI. Involving users or testers earlier in the design and deployment phases provides AI developers the opportunity to match their systems to actual project workflow or user expectations. Doing so may limit resistance to the use of AI and promote a higher level of perceived ease of use. The perceived ease of use is a significant factor in moving toward improved project productivity using AI, as indicated by this study. Regularly soliciting user feedback regarding the usability of an organization's AIs enables organizations to develop better and more effective AIs by addressing any usability concerns early in the project's life cycle.
- **Strengthening AI Competence through Targeted Training Programs:** The results reaffirm the critical need for organizations to develop tailored training initiatives for employees to improve their knowledge and skills when utilizing AI tools for project delivery. The training should not only provide an overview of the AI system but also teach employees how to utilize the tools in real-life scenarios so they can apply them to their current project planning, monitoring, and decision-making. Providing higher levels of confidence and competency in users will increase the likelihood that organizations will realize the full value of the AI and see improved efficiencies across all projects.
- **Promoting Continuous Improvement and Support in AI Adoption:** Organizations must continue to support the adoption of AI by developing a long-term strategy for implementation, continually enhancing the system, and improving technical support for all users. Technology is evolving very rapidly, and organizations need to conduct periodic assessments, provide appropriate updates, and offer users additional help to maintain the performance of AI as a tool for maximizing the efficiency of projects. Dedicated support teams and review systems will help organizations adapt the use of AI based on changes to the needs of the current project to ensure its ongoing use as a viable option for driving project efficiency into the future.
- **Aligning AI Implementation with Project Management Objectives:** Organizations wanting to adopt AI must ensure that their strategy for doing so is explicitly aligned with

the same objectives as those already identified in project management, namely time efficiency, cost control, risk reduction, and quality improvement. AI tools should be selected and configured based on how well they support particular functions in a project, rather than being designed solely for technological innovation. To achieve maximum efficiency with AI tools and prevent the waste or underutilization of these resources, the capabilities of any tool being implemented (i.e., the potential benefits to the project) must be clearly aligned with each project's actual indicators of performance (i.e., time, cost, risk, and quality).

- **Establishing Clear Governance and Accountability for AI Use:** Another key recommendation is the creation of clear governance to manage how AI is used throughout your organization's projects. Define who will take responsibility for the technology being designed and how it will interact with other processes, including data management and monitoring of the system's output. Having a clear definition of accountability will enable team members to trust that they are using AI correctly for the best interest of the organization and, therefore, will facilitate long-term improvement in the efficiency of all project activities. As a result, it will assist in minimizing the potential for misuse and/or over-dependence on AI's automated output.
- **Fostering a culture that encourages a supportive organizational culture around AI adoption:** Organizations should aim to cultivate a culture of experimentation, learning, and innovation around the application of AI to project management. When employees feel supported in trying new functionalities of AI, sharing their successful experiences with AI, and learning from their failures, they will have a higher degree of acceptance and perceived usefulness of AI as a tool. A supportive culture also lessens the likelihood of employee resistance to change and maximizes the efficiency of AI across an organization's various projects.
- **Making High-Quality Data Accessible to AI Systems:** For AI systems to function properly, they require accurate, timely, and relevant information to produce results that make sense. An organization must ensure that it has policies in place to manage the quality of its data through standardization, collection processes, validating the data, and ensuring maintenance of its data. Poorly maintained or collected information will affect the efficacy and utility of an AI-based system. Data that is properly maintained will increase the accuracy of an AI system, increase user trust, and improve the decision-making process.

Research Limitations

While this research has been valuable, there are some important limitations that must be addressed. The first limitation is the use of a cross-sectional quantitative design, which can only provide a snapshot of the perceptions of AI use, usability, and project efficiency during a specific time period. Cross-sectional designs are beneficial for evaluating correlations between the variables; however, they do not allow for conclusions regarding causal relations or changes over time. If the same data had been collected using a longitudinal design, additional information regarding the evolution of the perception of AI usability and adoption would have been available.

The second limitation to consider is that the data in this study are all self-reported through a questionnaire; therefore, there is a potential for common method bias and for subjectivity on the part of the individual respondents. A respondent's perception of AI use, the relative usability of AI systems, and/or project efficiency may be affected by the respondent's individual attitude towards AI use, the type of organizational culture within their organization, or their recent personal work experiences. In addition to this, even with the use of established and reliable measurement scales for all of the survey items, it may be possible for future studies to enhance the validity of their findings by including both objective performance metrics and multiple respondents.

Third, because this research focused on respondents only, it is possible that its findings cannot be generalized or applied to people from different parts of the world or in different organizations. Differences exist among countries in terms of technology infrastructure, AI maturity, regulatory environment, and organizational practices, which have an impact on the way AI affects the efficiency of projects. This research had a relatively limited sample size and therefore has relatively low statistical power; therefore, the results should be interpreted carefully when considering applications outside of this research setting.

Future Research Directions

In light of this study's findings as well as its limitations, there are several potential areas for further investigation in the future. Future researchers might consider using a longitudinal research design to explore how the use of artificial intelligence and the ease of use of AI tools affect the efficiency of projects over time, especially as organizations move through different phases of adopting and integrating AI into their business processes. This type of research design has the potential to provide researchers with a more accurate understanding of causal relationships and learning effects due to increased periods of AI usage.

In order to gain a more robust understanding of AI-enabled project success, future investigation could expand the conceptual framework by including additional variables such

as organizational culture and leadership support, quality of data, and employees' ability to use artificial intelligence. By including these additional variables (and/or both a moderator variable and an additional mediator), researchers will be able to find more nuanced pathways between how AI impacts project results.

It is also recommended that future research should explore comparative or cross-country engagement to determine the extent to which the relationships identified in this paper are consistent among developed and developing economies. The authors propose that a further avenue of study include conducting mixed-methods research to provide in-depth qualitative interviews combined with quantitative analysis in order to better understand the contextual factors that underpin implementation challenges and best practices for leveraging AI's advantages in project management. By taking these proposed steps, researchers will expand the theoretical and practical understanding of AI-infused efficiencies for project delivery.

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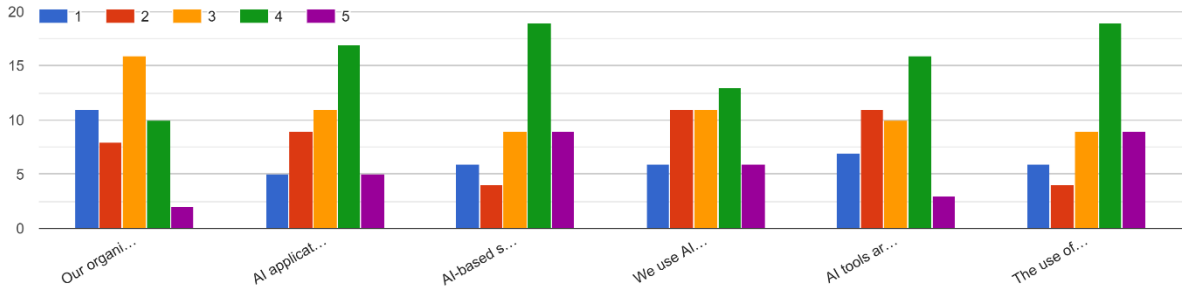
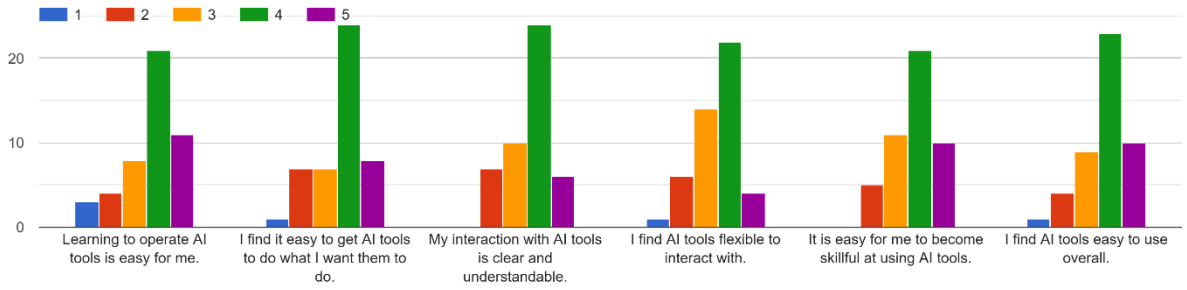
ANNEXES

Appendix A: Summary of Responses

Use of AI in Project Management How strongly do you agree with the following statements about Use of AI in Project Management in your organization ? (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree)



AI Tool Usability How strongly do you agree with the following statements about AI Tool Usability in your organization ? (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree)



Project Efficiency How strongly do you agree with the following statements about Project Efficiency in your organization ? (1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree)