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Eliminating Project Management Failure Through an AI-Enhanced Predictive Analytics to Improve Planning Accuracy and Project Success Rates

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Abstract
Project management failure is still very common as a result of poor planning, poor risk management, and resource allocation. Traditional approaches are often based on static models and human judgment, which is capable of poor handling of complexity and uncertainties in modern projects. This study is about how we can use AI power-packed predictive analytics tools to better plan and make projects more successful. A literature review points out the drawbacks of traditional practises and illustrates the role of AI applications in improving areas such as predictive forecasting, risk analytics, and decision support systems, which improves cost estimation, schedule adherence, resource optimization, and quality control. Using a qualitative approach and a case study-based methodology with secondary data deriving from real-world infrastructure and construction projects, the research results demonstrate that AI integration results in measurable improvements such as decreases in project delay, cost over-burdens, and defects as well as an increase in the overall satisfaction of stakeholders. The discussion highlights the role of AI in transitioning project management from reactive to proactive practises, the underlying mechanisms of predictive analytics in failure reduction, and the issues of adoption as it relates to quality of data and organisations and governance. The study concludes that AI enhanced predictive analytics is a transformative solution for managing a project. Recommendations include strategic AI integration and capacity building, piloting and continuous improvement with future research ideas focusing on longitudinal/quantitative in different project situations.

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Keywords: AI-Enhanced Predictive Analytics**,** Project Management Failure**,** Planning Accuracy**,** Decision Support Systems, Risk Mitigation

Introduction

Project management failure is a widespread and expensive problem in all industries and studies regularly report the overrun of schedules, escalation of costs, scope creep and unfulfilled stakeholder expectations as recurrent results of poorly planned and inadequately controlled projects. Traditional project management approaches make extensive use of historical experience, deterministic planning models, and human judgment, which often find it difficult to cope with the modern project environment with its elements of uncertainty, complexity, interdependence, and data overload. As projects have become more and more distributed teams, dynamic requirements, and rapid technological change have become more apparent, the shortcomings of traditional planning and monitoring tools have become starker (Niederman, 2021) [11].

A key reason for project failures is that planning assumptions are inaccurate and consideration of risks is not done early enough to allow for corrective action. Forecasting errors with regard to cost, duration, resources, and quality performance degrade decision-making still today, especially in the case of large-scale infrastructure, construction, software, and public-sector projects. Even in the cases where project management information systems (PMIS) are implemented, it is often limited to descriptive reporting rather than predictive information and leave managers reactive rather than proactive (Gonsalez, 2024) [4]. This is a reactive posture, however, which greatly decreases the possibility of project success in volatile environments.

In light of these shortcomings, artificial intelligence (AI) and predictive analytics is has become a transformative enabler in project management research and practice. This involves AI enhanced predictive analytics which takes advantage of machine learning, big data processing, and other advanced algorithms to determine patterns, predict the future whilst also aiding evidence-based decision making, which are crucial throughout project life cycle. Instead of needing standalone static plans, the AI system is able to learn incessantly from historical and real-time data of the project, to predict risks, optimize allocation of resources, and suggest adaptive strategies (Shoushtari, Daghighi, & Ghafourian, 2024; Nabeel, 2024) [15, 10].

The realizations at the conceptual level of Artificial Intelligence in project management are not absolutely new. Early studies of Levitt and Kunz (1987) proved the power of artificial intelligence techniques to facilitate planning, scheduling, and coordinating activities. However, the way this was practical implemented was limited by the power of computer and the availability of data. Recent developments in AI, cloud computing, and big data analytics have been able to conquer some of these obstacles and make scalable, intelligent project management systems that can work in complex environments with sufficient data (Prifti, 2022; Savio & Ali, 2023) [13, 14].

Recent empirical studies point out how AI-powered predictive analytics can dramatically improve planning accuracy and outcomes of any given project. Based on research, AI-enabled decision support systems have been found to improve the precision of forecasting in public infrastructure doings by utilizing past performance, environmental constraints and policy limitations to produce more dependable schedules and budgets (Paul, Rahman, & Nuruzzaman, 2024) [12]. Similarly, in construction and lean project environments, AI-based analytics help in reducing waste, quality prediction, and sustainability goals by developing strategies and detecting inefficiencies and potential defects before it occurs (Ajirotutu, Garba, & Olu, 2024; Fan, 2023) [2, 3].

Agile and software development projects have also benefitted from the usage of AI-based planning tools. As it has been learned from previous iterations and performance metrics of the team, AI is capable to enhance sprint planning, prioritize backlog tasks, and effort estimation, which will reduce uncertainty and risk of delivery (Lumbanraja, Raharjo, & Fitriani, 2024; Kanbur, O. P. C., & Kulkarni, 2023) [9, 7]. In a distributed and multi-project setup, added coordination across portfolios is also made possible with the help of AI enhanced systems spanning the portfolio environment, predicting resource conflicts and interdependencies often not identified by human planners (Uzgoren *et al*., 2025; Gonsalez, 2024) [16, 4].

Despite all these advancements, there are challenges associated with the adoption of AI in project management. Systematic literature reviews found that limitations in data quality data, organisational resistance, lack of AI expertise, ethical issues, and challenges in integrating AI technology with existing PM frameworks are some barriers that have been cited against effective implementation (Hashfi & Raharjo, 2023; Hashimzai and Mohammadi, 2024) [5, 6]. Furthermore, projects around Artificial intelligence are also vulnerable to failure when poorly governed thereby reinforcing the demand for structured, transparent and context aware Artificial intelligence deployment strategies (Westenberger, Schuler, & Schlegel, 2022) [17].

Against this backdrop, this article discusses how AI-driven predictive analytics can be strategically used to eliminate significant causes of project management failure through planning accuracy improvement and increase project success rates. By synthesizing knowledge from existing literature and conducting a case study using actual data-based case studies, the study is set to illustrate how predictive intelligence is used to change project planning from a static, assumption-based activity to a dynamic, data-based capability. In doing so, the article adds to the emerging body of knowledge on the use of AI in project management and offers practical implications for managers who are interested in improving resilience, foresight and performance in complex project environments.

Literature Review

Overview of Project Management Failure

Project management failure has been well documented in industries, with there being ongoing challenges with inaccurate planning, poor management of risks and resources, and poor decision-making processes. Traditional project management methodologies rely heavily on linear planning models, fixed schedules, and human intuition which are becoming increasingly incapable in complex, uncertain and data-intensive projects environment (Niederman, 2021) [11]. As projects grow larger and more complex, inaccuracies in the estimate will ripple out into big cost overruns and delays, as well as quality disasters.

Several studies underline that failure is by no means typically due to one factor, but rather arises from interrelated deficiencies in forecasting, coordination and adaptability. One key point that Gonsalez (2024) points out is that for conventional Project Management Information Systems (PMIS), they are essentially descriptive, providing reporting on what has happened but not agreement about what will happen or should happen. This limitation makes it difficult for managers to spot problems coming ahead of time and halt them, enabling failures to be more likely in multi-project and dynamic situations.

Systematic reviews also help to confirm that uncertainty, incomplete information, and cognitive bias in human decision-making can be at the heart of poor project performance (Hashfi & Raharjo, 2023; Hashimzai & Mohammadi, 2024) [5, 6]. These challenges put into light the importance of having smart systems that are capable to analyze large datasets, detect hidden patterns and dynamically update forecasts over the lifecycle of the project.

Emergence of Artificial Intelligence Enhanced Predictive Analytics in Project Management

Artificial intelligence has come up again as a crucial enabler on how to address longstanding project management deficiencies. Building on prior initial work by Levitt and Kunz (1987), the more recent fields of AI-aided predictive analytics combines machine learning, big data analytics, and automated reasoning to better plan and better decide. Unlike the old-fashioned tools, AI systems learn from past and real-time project data and make it possible to adaptively forecast and plan for different scenarios (Prifti, 2022) [13].

Nabeel (2024) shows that AI-enabled project management systems are a crucial means in improving outcome prediction through multidimensional data in regards to cost, schedule, risks and utilization of resources. These systems help managers to identify the early warning signals, optimise

tradeoffs and mitigate the risks before they turn into failures. Similarly, Shoushtari, Daghighi, and Ghafourian (2024) report AI applications increase the reliability of planning by minimizing human bias and increasing consistency for decision-making [15].

In infrastructure and public-sector projects, has given us an AI-enabled decision support system have been used to provide more 'accurate' planning as well as governance by synthesizing the technical data, financial data and regulation data in to actionable insights (Paul, Rahman, & Nuruzzaman, 2024) [12]. This is especially important in an environment where there is an intersection between political, social, and operational uncertainties.

AI Applications to Increase Planning Accuracy and Prevent Failure

Empirical research makes out a few AI driven mechanisms that focus on the root causes of project failure. Predictive analytics allows for better cost and schedule forecasting because they learn from the previous project performance and adjust their estimates continually as things change (Savio & Ali, 2023) [14]. In construction projects, AI-driven defect recognition models promote quality prediction, with less rework time which is a key source of time and cost overruns (Fan, 2023) [3].

Lean construction Studies further reveal that artificial intelligence (AI) helps in optimizing the efficiency of the workflow and sustainability by detecting waste, optimizing the work timing or sequence and planning decisions that are directly driven by data (Ajirotutu, Garba, & Olu, 2024) [2]. Within agile and software development has AI value of sprint planning, backlog prioritization, and effort estimation, decrease uncertainty and delivery risk in the case of iterative project environment (Lumbanraja, Raharjo, & Fitriani, 2024, Kanbur, O. P. C., & Kulkarni, 2023) [9, 7].

At the portfolio level and the distributed systems level, enhanced by AI, is used to provide coordination among several projects, predicting resource conflicts as well as interdependencies (quite invisible to human planners) (Uzgoren *et al.*, 2025; Gonsalez, 2024) [16, 4]. These capabilities are critical to improving overall project success rates in organisations that are managing complex project ecosystems.

Challenges and Limitations of Adopting AI

Despite how powerful it is, the literature also identifies strong barriers to successful A.I. implementation in project management. Data quality problems, organizational unreadiness, lack of Artificial Intelligence skills, and resistance to algorithmic decision-making are still common issues (Hashfi & Raharjo, 2023; Hashimzai & Mohammadi, 2024) [5, 6]. Further, Westenberger, Schuler and Schlegel (2022) note that AI initiatives themselves can fail, if governance structures, transparency and alignment with organizational goals is lacking [17].

These findings suggest that AI should not be considered an autonomous tool but an augmenting capability which should be embedded in powerful project governance frameworks. Successful adoption involves building a situation of strategic alignment, human-AI collaboration, and continuous learning mechanisms so that we are confident that the AI generated insights will be reliable and trusted.

Problem Statement

Despite project management methodologies and information systems, project failure rates continue to be unacceptably high due to inaccurate planning, reactive risk management and lack of predictive capability. Traditional tools are not capable of processing a complex and dynamic data environment and lead to problematic forecasts and time delays when it comes to decision-making. While the role of AI technologies to address promising solutions, the role AIs decision-making accounts to systematically remove project management failure by better predictive analyses still lack adequate operationalisation and empirical support.

Research Objectives

The objectives of this study include to:

1. Examine the main reasons for the failure of project management with regard to planning in complex project environments.
2. Analyze how the predictive analytics boosted by artificial intelligence helps to plugin the accuracy of planning in somewhat diverse project fields.
3. Evaluate the role of artificial intelligence (AI) enabled decision support systems in improving the success rate of projects.
4. In real-world case study situations, show how the use of AI-enabled predictive analytics reduces the risk of failure and facilitates improved project outcomes;

Statement of Solution

This research has proposed a strategic solution of AI enhanced predictive analytics in its mission of eliminating project management failure by transforming planning in its processes, by switching from static planning that depends on assumptions to dynamic planning that relies on data. By using machine learning, big data analysis, and intelligent decision support systems, project managers can anticipate potentially dangerous situations, optimize and distribute resources, and change plans in real time. When integrated with current project management frameworks, and backed up by a good governance framework, the use of AI supported predictive analytics can drastically enhance planning accuracy and project success rate, paving a sustainable path towards overcoming persistent project management challenges.

Methodology

Research Design

This study adopts the qualitative explanatory research design under the support of a case study approach to examine the issues on how AI-enhance predictive analytics can eradicate failure in the project management by improving the planning accuracy and project success rate. This design is suitable as the research aims at explaining the ways in which AI-based predictive potential influences planning outcomes as opposed to statistically testing for the causal relationships. Prior researches pertaining to the topic of AI in project management have tried to use qualitative and case-based design to understand complex phenomena that are context-dependent (Shoushtari, Daghighi, & Ghafourian, 2024; Hashimzai & Mohammadi, 2024) [15, 6].

Data Sources and Selecting Criteria

The current study is solely confined to secondary data that came from peer-reviewed journal articles, conference papers, and systematic review of literature supplied by the author. No outside sources are used other than the ones provided in the references. The criteria used for selecting the studies are as follows:

- Direct application to Artificial intelligence applications to project management.
- Explicit emphasis among predictive analytics or decision support systems or planning optimization.
- Empirical or analytical discussion on performance of project, risk mitigation or failure reduction.
- Publication -- without relying on journals or conferences already published; in the case of papers, publications in reputable academic journals or conferences.

This approach guarantees quality of research such as methodological rigour, conceptual consistency, and accordance with existing research on AI-enhanced project management systems (Niederman, 2021; Prifti, 2022) [11, 13].

Case Study Approach

A real-life case study is used to illustrate the practical application of the use of AI-enhanced predictive analytics to solve planning failures. The case study is built analytically based on documented implementations of AI-enabled decision support systems based on public infrastructure and construction project environments and documented by Paul, Rahman, and Nuruzzaman (2024) and Ajirotutu, Garba, and Olu (2024) [12, 2].

The case focuses on:

Initial planning inaccuracies concerning cost, schedule and resource allocation.

Deployment of artificial Intelligence enhanced predictive analytics in forecasting, identifying risks, and decision support.

Tangible improvement in planning accuracy, risk management and overall more effective planning of projects.

An advantage of using documented outcomes is that it provides the empirical grounding but avoids the methodologies bias associated with collecting primary data.

Analytical Framework

The study uses the thematic content analysis framework to synthesise the insights derived from the selected literature and case study. Some key analytical themes are deductively identified from the research goals and are:

- Planning accuracy and reliability in forecasting
- Predicting and early warning mechanisms for risks
- Resource optimization and decision Support
- Project success indicators (time, cost, quality and satisfaction of stakeholders)

The different themes are explored to highlight recurring patterns and explanatory mechanisms relating AI adoption and reduced project failure using AI-enhanced predictive analytics for different failure cases (Nabeel, 2024; Savio and Ali, 2023) [10, 14].

Method of Analysis

The analysis is done in three stages:

- Literature Synthesis: Comparing and evaluating research on planning failures and AI solutions.
- Case Mapping: Mapping of case study evidence to identified analytical themes in an effort to prove real world applicability.
- Interpretive Analysis: Explanation of contribution of AI enhanced predictive analytics to improved planning accuracy and improved project success rates.

This multi stage approach contributes toward increasing the analytical depth and making the findings received more valid (Gonsalez, 2024; Hashfi og Raharjo, 2023) [4, 5].

Validity and Reliability

In an attempt to improve construct validity the study makes use of several scholarly sources that deal with similar constructs such as planning accuracy, predictive analytics, or project success. Reliability is guaranteed by transparent documentation of data sources and utility through uniformity of application of analytical framework across all reviewed studies. Limit to peer reviewed literature is also a source to further strengthen the methodological credibility (Westenberger, Schuler, & Schlegel, 2022) [17].

Ethical Considerations

As the research is based only on secondary data received from research published in published sources and documents, there is no requirement for ethical endorsement. All sources are properly cited and people's intellectual property rights are respected. The analysis does not fabricate data, misrepresent data or only report certain information.

Methodological Limitations

The main limitation of this methodology is the use of secondary data, which limits the direct measurement of quantitative performances improvement. However, this is overcome by having drawn on a range of empirical research and cases in practise, enabling us to perform analytical triangulation. Future research may continue this work in mixed method or quantitative ways.

Results

This section presents the synthesized findings from the reviewed literature and the applied case evidence on the use of AI-enhanced predictive analytics in project management. The results are organized around planning accuracy, failure reduction mechanisms, and project success outcomes. To improve clarity, the findings are summarized using structured tables aligned with the study objectives.

1. Impact of AI-Enhanced Predictive Analytics on Planning Accuracy

The reviewed studies consistently indicate that AI-enhanced predictive analytics significantly improves planning accuracy across cost, schedule, resource allocation, and risk forecasting dimensions. AI systems outperform traditional planning tools by continuously learning from historical and real-time data, thereby reducing estimation bias and uncertainty.

Table 1: Effects of AI-Enhanced Predictive Analytics on Planning Accuracy

	Traditional Planning Limitations	AI-Enhanced Predictive Analytics Outcomes	Key Supporting Studies
Cost Estimation	Static budgets, optimism bias	Dynamic cost forecasting, variance prediction	Nabeel (2024) [10]; Savio & Ali (2023) [14]
Schedule Planning	Deterministic timelines	Adaptive scheduling with delay prediction	Paul *et al*. (2024) [12]; Lumbanraja *et al*. (2024) [9]
Resource Allocation	Manual estimation, inefficiencies	Optimized resource utilization and conflict prediction	Gonsalez (2024) [4]; Uzgoren *et al*. (2025) [16]
Risk Identification	Reactive risk registers	Early warning systems and predictive risk scoring	Shoushtari *et al*. (2024) [15]; Hashimzai & Mohammadi (2024) [6]

The findings show that AI-enhanced systems transform planning into a continuous and adaptive process, thereby addressing one of the root causes of project management failure poor forecasting accuracy.

2. AI Mechanisms for Reducing Project Management Failure

The literature reveals that AI does not eliminate failure through automation alone but through intelligent decision support mechanisms that enhance managerial foresight. Predictive analytics enables early detection of deviations, quality issues, and coordination failures before they escalate.

Table 2: AI Mechanisms and Their Role in Failure Reduction

	Functional Role in Project Management	Failure Reduction Effect	Supporting Evidence
Machine Learning Forecasting	Learns from past project data	Reduces schedule and cost overruns	Niederman (2021) [11]; Prifti (2022) [13]
Predictive Risk Analytics	Anticipates risk likelihood and impact	Prevents late-stage crises	Shoushtari *et al*. (2024) [15]
Defect Prediction Models	Identifies quality risks early	Minimizes rework and delays	Fan (2023) [3]; Ajirotutu *et al*. (2024) [2]
AI Decision Support Systems	Provides data-driven recommendations	Improves managerial decision quality	Paul *et al*. (2024) [12]

These mechanisms collectively shift project management from reactive control to proactive prevention, significantly lowering failure probability.

3. Case Evidence: Infrastructure and Construction Projects

Case-based evidence from public infrastructure and construction projects demonstrates measurable improvements after the integration of AI-enhanced predictive analytics. AI-enabled decision support systems improved forecasting accuracy, resource efficiency, and compliance with quality standards.

Table 3: Observed Improvements from AI Implementation in Real-World Projects

	Pre-AI Condition	Post-AI Implementation Outcome	Source
Schedule Adherence	Frequent delays	Improved milestone predictability	Paul *et al*. (2024) [12]
Cost Control	Budget overruns	Reduced cost variance	Nabeel (2024) [10]
Quality Performance	High defect rates	Early defect detection and correction	Fan (2023) [3]
Resource Efficiency	Resource conflicts	Optimized allocation and reduced idle time	Ajirotutu *et al*. (2024) [2]

The case evidence confirms that AI-enhanced predictive analytics contributes directly to improved planning accuracy and project success, particularly in complex and data-intensive environments.

4. Project Success Rate Improvement

Across the reviewed literature, project success is consistently associated with improvements in time, cost, quality, and decision effectiveness. AI-enhanced predictive analytics strengthens these success dimensions by enabling continuous learning and adaptive planning.

Table 4: Contribution of AI-Enhanced Predictive Analytics to Project Success Dimensions

	AI Contribution	Outcome
Time Performance	Predictive scheduling and early alerts	Fewer delays
Cost Performance	Real-time cost forecasting	Budget stability
Quality Outcomes	Defect prediction and monitoring	Reduced rework
Decision Effectiveness	Data-driven insights	Higher success probability

Studies also indicate that organizations integrating AI within structured governance frameworks achieve more sustainable success outcomes than those adopting AI in isolation (Westenberger *et al*., 2022; Hashfi & Raharjo, 2023) [17, 5].

Discussion

The results we have highlighted in the section above provide us with some interesting information on how artificial intelligence-driven predictive analytics can help us overcome

the traditional project management challenges and ultimately lead to better planning accuracy and a high level of project success storeys. This discussion links the results to current theories, explains the implications for the practise, and discusses the limitations related to the integration of AI in project management.

AI's Role in increasing the Accuracy of Planning

One of the most striking points can be the great improvement in planning accuracy thanks to the predictive analysing work with AI. Traditional project management techniques rely in many cases on past data and human judgment, both of which possibly suffer from serious biases and inaccuracies, especially in volatile project environments. The power of AI in handling large amounts of real-time and historical data enables the continuous learning process that renders the projects made more adaptable and accurate in forecasting. This ability is consistent with the argument presented by Niederman (2021) that AI can disrupt the traditional project management by providing more sophisticated and adaptive tools [11]. The dynamic action of AI-driven systems is a stark contrast to the static estimation methods that are human-based, ensuring that timelines, costs, and resource needs of a project is optimised on the go.

In actual fact, AI leads to a more flexible and responsive approach to project management, with AI can help project managers anticipate possible disruptions and make modifications earlier than they bring about delays or budget overruns (Prifti, 2022) [13]. This approach from reactive to proactive can be extremely useful in industries where the scheduling and costing of their projects and projects are constantly under pressure, where we see construction and public infrastructures. This from reactive to proactive one can be especially useful in industries where the scheduling and costing of their projects especially they're under constant pressure such as construction and public infrastructures.

Predictive Risk Analytics: Moving from Reactive to Proactive Modes

Risk management is one of the most crucial parts of successful project management and the ability to predict and manage risks before they become a problem is a major benefit of AI-enhanced predictive analytics. As can be seen in Table 2, AI tools are able to identify and evaluate risks by looking at the patterns in information and thereby give managers early warning signals. This predictive capability is critical in ensuring the success of the project, especially in construction and infrastructure industries, where mismanaged risks can cause project overruns of cost and time, often reaching millions of dollars or years. This predictive ability is indispensable in the failure of project timelines, especially in the construction and infrastructure sectors, where mismanaged risks can result in massive cost and time overruns, in the amount of millions of dollars or years.

The integration of predictive analytics into the project lifecycle allows for risk assessments to be made in real-time, which makes for greater agility when it comes to decision-making. For instance, systems based on AI in the case study showed the confidence to spot potential delays or resource shortages at a point in time when they were not critical, and as a result, manager can adjust the timeline or allocate the resources proactively (Ajirotutu *et al*., 2024) [2]. By giving early insights into potential disruptions, AI-led, AI-based systems are in line with what Shoushtari, Daghighi and Ghafourian (2024) believe to mean that AI has the potential to optimise the risk mitigation strategies by making decisions more accurate and less of a guesswork [15].

Resource Optimization and Efficiency Increased

The discoveries on resource allocation can be summarised by saying that the use of AI-enabled systems has enhanced the efficiency level considerably by optimising the use of available resources, as shown in Table 1. In traditional project management, resource allocation is frequently based on estimates that don't account for changes in project conditions in the real time. This can lead to the underutilization or overutilization of resources, both of which have negative impacts on the outcomes of the project (Gonsalez, 2024) [4].

AI-driven systems, however, continuously evaluate and adapt the resource needs based on real-time data from the project leading to accurate and efficient allocation of resources. This capacity is especially crucial in the multi-project environmental which can lead to inter dependencies and resource conflicts resulting in delays and cost interruptions. AI's capacity to foresee and prevent these conflicts before they occur is part of better project timelines and cost management such as is demonstrated from the case study outcomes where resource optimization played a vital role in mitigating idle-time and maximising productivity (Uzgoren *et al*, 2025) [16].

Additionally, the fact that AI is able to predict resource conflicts or shortages before they affect the project is a key feature of AI in that it not only offers visibility into where the project is but also offers possibilities to see where resource needs will extend in the future. This existing dynamic, data-driven approach to resource management leads to an increase in the ability to react to changing conditions and reduce disruptions to the projects.

Quality Control and Defect prevention

Quality control is another area where AI shows high potential of reducing project failures. AI-driven models controlling deflections in software such as used in construction and infrastructure, give us the luxury of early detection of a quality/defector that might be otherwise undetected till the later stages of the project. As illustrated in Table 2, the potential for AI to predict the possibility of defects occurring in the future, using the history of previously made defects and real-time sensor data as inputs, results in a higher quality output and fewer occurrences of rework, a major source of project delays and cost overruns (Fan, 2023) [3].

The findings are in line with the argument that AI can accomplish quality control improvements by giving more precise predictions about where defects may be likely to occur and how they can be avoided. This type of proactive quality assurance approach is quite unlike the traditional approach to quality assurance which usually involves periodic cheques or quality assurance activities only after construction and quality control. By introducing AI-driven defect detection systems into the project management process, businesses can substantially minimize errors and boost the chances of completing projects of high quality within the allotted timeframe and budget (Ajirotutu *et al*., 2024) [2].

AI and Project Success Rates

The ultimate measure of the success of project management is whether a project has been completed on time, within

budget and to the expected quality standards. AI's contribution to the improvement in the project success rate is evident by the improvements in schedule adherence, cost control, and resource optimization (Table 3). The case evidence shows that AI-enhanced systems not only deliver operational efficiency but also help build greater confidence in stakeholders which results in greater satisfaction by the project outcomes (Nabeel, 2024) [10].

Moreover, the capability of AI systems to be able to provide data-based recommendations empowers project managers to be able to make more informed decisions that further lead to more successful outcomes. For example, in the case study, the capability to dynamically adjust project schedules and budgets running off of AI-generated forecasts resulted in more predictability and fewer surprises, which in turn drove improved overall success rate of the projects. This finding supports the argument that AI can help to turn project management into a more predictable, reliable, and success-oriented practise (Savio & Ali, 2023) [14].

Challenges and Obstacles to Adopt AI

While the pros of using AI-enhanced predictive analytics are apparent, AI adoption in project management has its challenges. The literature points out a number of barriers for effective AI integration, including data quality problems, organisational resistance and lack of expertise (Hashfi & Raharjo, 2023; Hashimzai & Mohammadi, 2024) [5, 6]. These challenges are especially common in industries where project management practises are deeply rooted and where the transition to taking an AI-led approach involves significant organisational change.

Furthermore, as acknowledged by Westenberger, Schuler and Schlegel (2022), AI projects themselves are not immune to failure. Poor governance and a lack of transparency and alignment between AI systems and project goals can also result in less than optimal results [17]. Therefore, for AI to genuinely have a mitigating impact on project management failure, it should be embedded in a holistic governance framework that can ensure its integrity, accountability, and alignment with organisational goals.

In summary, the results of this study confirm that the application of AI-empowered predictive analytics has the ability to significantly improve project management practises, including improved planning accuracy, risk prediction, resource allocation optimization, and improved overall project success rates. However, there are several challenges to overcome in order to successfully implement AI, including data quality, expertise, and organisational resistance. Future research should be aimed at identifying the barriers to overcome and the long-term impacts of AI on project management practises.

Conclusion

This study shows how incorporating the power of AI-enabled predictive analytics into project management provides a game-changing way for dealing with perennial planning inaccuracy and project failures by project managers. The synthesis of the findings suggests that AI helps in doing precise cost estimation, adaptive scheduling, optimized resource allocation, and proactive risk identification, and in general, project management has been fundamentally transformed from a reactive discipline to a predictive one. The case study demonstrates that when AI-driven decision support systems are deployed in the real world, they result in tangible benefits for the performance of the projects, such as better timelines adherence, budget overrun reduction, quality outcomes, and stakeholder satisfaction.

The paper is a contribution to the concept of how AI can be made operational to improve planning accuracy and success of projects. It highlights the mechanisms by which predictive analytics is helping drive decision-making and the reduction of uncertainty, and help build resilience into projects. By showing the practical use of AI in complex project environments, the study provides providers with information about how managers are to act if they wish to deploy intelligent systems to manage failure risks practically.

Despite the positive and the good results, the study acknowledges some limitations in the study. The results are based on secondary data and documented case studies, which may not reflect the entire diversity of the contexts of projects or quantify precisely the improvements in performance. Additionally, challenges related to data quality, organizational readiness, and system integration have pointed to the AI adoption is carefully planned, governed, and overseen by humans.

In future research, longitudinal assessments and quantitative evaluations of AI boosted project management systems across different industries should be examined. Investigations of hybrid methods that merge insights provided by AI with human judgement, as well as the ways to overcome organizational and technical challenges, would move the field further. Overall, this study strengthens the prospects of artificial intelligence-facilitated predictive analytics to revolutionize the practice of project management, paving a way toward improved accuracy in planning, low failure odds, and the success retention of projects.

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