



PROJECT MANAGEMENT 5.0: INTEGRATING ARTIFICIAL INTELLIGENCE, HUMAN CREATIVITY, AND SUSTAINABLE INNOVATION

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Abstract

Project Management 5.0 became a gamechanger, combining AI, human creativity, and sustainable innovation to optimize project performance in the evolving, dynamic landscape of organizations. This study explored how these three dimensions can contribute to the growth of modern project management. It employed a qualitative conceptual research design to examine key trends, opportunities, and challenges in their implementation. Secondary data comprised a purposive sample of 120 scholarly publications (peer-reviewed journal articles, conference papers, book chapters, and institutional reports) published between 2021 and 2026. Thematic content analysis was used to analyse the collected literature and synthesize existing knowledge and patterns around Project Management 5.0. The results showed that 93.3% of the reviewed publications discussed the integration of Artificial Intelligence, 86.7% discussed human-centred leadership, 84.2% discussed digital transformation, 81.7% discussed sustainable innovation, and 80.0% discussed human-AI collaboration. The analysis also showed that the most common implementation challenges were digital skills shortages (85.0%), resistance to change (79.2%), ethical governance concerns (75.0%), and cybersecurity (72.5%). They found that the successful adoption of Project Management 5.0 required a balance among intelligent technologies, human skills, ethical management, lifelong learning, and sustainable project practices. The results added to the existing knowledge on Project Management 5.0. They offered practical recommendations for project managers, organizational leaders, and policymakers who want to increase innovation, resilience, and long-term project success in the digital world.

Keywords: Artificial Intelligence; Digital Transformation; Human Creativity; Project Management 5.0; Sustainable Innovation; Thematic Content Analysis.

1. Introduction

In the digital revolution, new technology is revolutionizing project planning, delivery and tracking in all sectors. The use of artificial intelligence (AI), machine learning, big data analytics, digital twins and intelligent automation has empowered project management teams with the ability to offer more accurate predictions, pinpoint risk factors, allocate resources and make informed decisions. Given the changing organizational landscape, P.M needed to be agile, innovative and sustainable, and to work with various stakeholders within the cost, time and quality envelope. One of the breakthroughs at the beginning of PM 5.0, which came with a human-centric paradigm, was the innovation that brought together the greatest of human



intelligence and technological capabilities to achieve sustainable results in every project. Among the latest advantages pointed out by multiple AI studies (Nenni et al., 2024; Dani et al., 2025), is that of giving power to project managers by delegating repetitive tasks to AI, where they can concentrate on more creative and strategic work, leadership.

Its forerunner "Industry 4.0" was the analysis of using smart technology instead of human skills; Industry 5.0 brings in the approach of smart technology and human skills working together. This outlook values creativity, emotional intelligence, ethical judgment, and collaboration as valuable skills to complement the capabilities of AI tools for analysis. More and more organizations started to use artificial intelligence (AI) for project planning, predictive analytics, NLP, and generative AI to help improve their productivity, project governance, and decision-making – which could only be done by them. A balance among technological efficiency, human-centred leadership, responsible innovation, and organisational resilience has been proposed to ensure the successful delivery of a project. The project's adaptability, along with the creation of an ongoing learning environment in a constantly evolving business landscape, was promoted by this type of integration (Martini et al., 2024; Nenni et al., 2024).

The other major aspect of the modern project management world is sustainability, as pressure is growing on organisations to maintain a balance between financial and environmental elements, and social and economic elements. Access to energy efficient decision support systems during project planning, with the aid of AI-based energy predictive models and real-time monitoring, reduced energy resource wastage that were otherwise considered when deciding upon energy consumption throughout the project. At an increasingly diverse level, project managers started featuring the Sustainable Development Goals (SDGs) in project purposes, making a project life cycle part of responsible innovation, transparent governance, and value creation for stakeholders. AI technologies and sustainability efforts have been found to increase the value of an organization in the long term, encouraging sustainable resource management and social well-being (Araújo et al. 2025, Jariwala 2024).

PM 5.0 was a young, growing, and underdeveloped area of study, lacking well-developed frameworks and ideas linking AI with Artistic creativity and Sustainable innovation in practice. The dimensions were investigated separately in previous research, without the single framework to check how these dimensions interact in the context of the project. Ethical issues with respect to the adoption of Artificial Intelligence in organizations, capability building of the workforce, governance and organizational culture, and digital transformation were other issues identified by organizations. To resolve these challenges, a comprehensive framework for the co-creative value of intelligent technologies and human innovation in supporting sustainability-focused projects was needed. This study aimed to provide a snapshot of the latest Project Management 5.0 information that would aid in understanding the fundamentals, opportunities, and problems associated with Project Management 5.0, and further discussion of the future of project leadership in a digitally enabled organization (Nenni et al., 2024; Dani et al., 2025; Cappa et al., 2024).

Research Objectives

1. To explore how AI can improve Project Management 5.0 practices.
2. To understand and analyse the combination of creativity and Artificial Intelligence for better project performance and innovation.
3. To examine the role of sustainable innovation in the successful implementation of Project Management 5.0.

Research Questions

- Q1. What was the contribution of AI in implementing Project Management 5.0?
- Q2. What impact did the use of AI and human creativity have on project innovation and decision-making?
- Q3. What contribution did sustainable innovation make to the success of the project in the context of Project Management 5.0?

Significance of the Study

By filling a void in the literature and providing a broad perspective of the fusion of artificial intelligence, human creativity, and sustainable innovation in contemporary project scenarios, this research has



advanced the field of Project Management 5.0. The study brought together the latest developments in theory to explain how the intelligent technologies were used to enhance the capabilities of humans to achieve efficient, innovative, and sustainable project outcomes. The results offered practical suggestions to project managers, organizational leaders, decision-makers, and researchers seeking human-centred, technology-based project management practices. The research revealed the need to integrate different technologies and management practices with creativity, ethical considerations, and sustainability, which is crucial for other organizations striving for digital transformation and for future research to establish and propose an intelligent and sustainable project management framework.

2. Literature Review

Artificial Intelligence in Project Management 5.0

Artificial Intelligence has been one of the most remarkable technologies to emerge, revolutionizing Project Management 5.0. These AI-powered project management systems enhance forecasting, scheduling, risk analysis, and resource management through predictive analytics and machine learning, minimizing the need for human experience and intuition in decision-making. The AI-driven tools gave rise to the new features of predictive analysis and machine learning, achieving greater efficiency in forecasting, scheduling, predicting risks, and optimizing resources compared to manual planning and experience. This supportive combination of human-centric management and intelligent technologies has driven organisations to seek a more efficient and flexible approach, while simultaneously strategic and ethical with their projects, towards Industry 5.0. Systematic reviews in recent years have substantiated the strong effectiveness of AI, which has led to substantial benefits in project planning accuracy and support for decision-making in complex engineering and construction and information technology (IT) driven projects (Taboada et al., 2023; Nenni et al., 2025).

The concept of Project Management 5.0 went beyond focusing on the tool and technology to identifying the focus on People-to-People and People-to-Intelligent Systems collaborative working, along with Resilience and Sustainability. AI has transformed the nature of most roles within the project management world, taking on repetitive tasks, forecasting potential project risks on the fly, and improving communication with stakeholders through smart decision support systems, researchers said. AI has led to faster project dynamics decision-making for the project manager and improved project governance by enabling it to interpret vast amounts of data. The literature suggests that AI is viewed as a tool to complement managerial abilities and performance, rather than as a replacement for managerial judgment and skills (Dani et al., 2026; Nenni et al., 2025).

In addition to being an aid in writing research papers, AI is becoming a valuable tool for businesses looking to improve project performance, increase business agility, and make informed strategic decisions. AI is increasingly used in trendy ways, such as streamlining project actions, increasing business agility, and helping to make data-driven strategic decisions. The intelligent algorithms resulted in improved, optimized schedules, budgets and quality monitoring and measurement throughout the project lifecycle, reducing uncertainty. Researchers also uncovered challenges and constraints in the implementation of Artificial Intelligence, including Data quality, ethical issues, organisational readiness, and the skillshe skills of the organisation's workforce. The results indicated that to realize the benefits of project management 5.0, it is crucial to have the technological infrastructure and strong organisational leadership to help the project succeed (Taboada et al., 2023; Dani et al., 2026).

Human-CAI and AI potential

Users regularly stressed the need for the human touch in project management, with AI playing a crucial role but by no means replacing it. It was reiterated that human creativity is very important, because the AI technology could boost the analytical ability, but it will not replace human creativity. The project management skills developed through creative thinking proved very helpful when dealing with uncertainty, guiding the team in discussions with stakeholders and, eventually, working out solutions to problems that were not always structured. The project managers' creative abilities were also beneficial for negotiating stakeholder interests, solving unstructured problems, and finding innovative solutions that the AI system could not create. In Industry 5.0, creativity, the ability to understand emotions, and ethical sense were important attributes for



sustainable project management, alongside intelligent machines and human skills and knowledge. This approach to humans was a strong contrast with the industry 4.0 practices that were based on automation (Dani et al., 2026).

Recently another study found that AI systems increased creativity, allowing project teams to access information, different design options, predicting simulations, and knowledge discovery tools within a short span of time. AI tools are not intended to replace original creative humans, but rather to complement and augment them, enhance their problem-solving skills and accelerate and shorten cycles of innovation. Organizations that reported success with integrating AI with other HR-related activities were seen to be more adaptable to the use of AI in multidisciplinary project teams, as well as noted to have more collaboration between team members and to have created more innovation in performance. The relevance of integrating computational intelligence and human knowledge was highlighted as crucial in the context of the project at hand, as indicated by the results (Nenni et al., 2025; Dani et al., 2026).

The PM Institute announced several new certificates late last month to empower project managers to succeed in the world of AI-enabled work. With the growing use of intelligent technologies in the workplace, new or emerging skills are required, including digital literacy, strategic thinking, ethical awareness, communication, and interdisciplinary collaboration. Using emotional intelligence, creativity, and technology, the researchers hypothesized that the next generation in the project leadership would be successful in adapting to the rapid evolution of the business world. Taboada et al. (2023) noted that this equated to innovation and furthered the project's capabilities to gain trust, ensure accountability, and engage stakeholders during project implementation.

Sustainable Innovation in Project Management 5.0

Trusting in environmental, social, and economic sustainability helped organizations recognize the value of promoting sustainability within the framework of business 5.0, thereby making sustainable innovation a part of project management 5.0. AI in project management helped improve sustainability outcomes, leading to better resource utilization, less operational waste, improved energy efficiency, and better decision-making, researchers found. This too manifested in the need to develop technologies that increase the productivity of humans, but also technologies that help humans to achieve a healthy life and a sustainable future, as in the case of Industry 5.0 (Dani et al., 2026; Tornjanski et al., 2023).

Newer enterprise organizations began to incorporate more facets of concern such as Environmental, Social, and Governance (ESG) into business project decision making, execution and assessment. The AI analytics proved useful to project managers for real-time tracking and forecasting of environmental impacts, boosts to project measurability, and strengthens the project's overall resilience by monitoring sustainability metrics. Systematic reviews in recent years demonstrated that sustainable innovation increased the competitiveness of the organizations by using intelligent technology and responsible governance and management based on the needs of the stakeholders. The progress made has allowed sustainability to be part and parcel of the success of Project Management 5.0 – and not some extra requirement of the Project organisation (Nenni et al., 2025; Taboada et al., 2023).

Despite the rising popularity of Project Management 5.0, academics noted that organisations still faced issues implementing project management, specifically in ethical AI governance, digital transformation, workforce readiness, and the incorporation of sustainability practices. Research to date has suggested the need for staff training, leadership commitment, and processes for learning, good governance, and accountability. The literature pinpointed the key elements for using artificial intelligence effectively: human creativity and sustainable innovation to create "resilient", "adaptive" and "socially responsible" environments across the phases of the project (Tornjanski et al., 2023; Dani et al., 2026).

Conceptual Framework Model

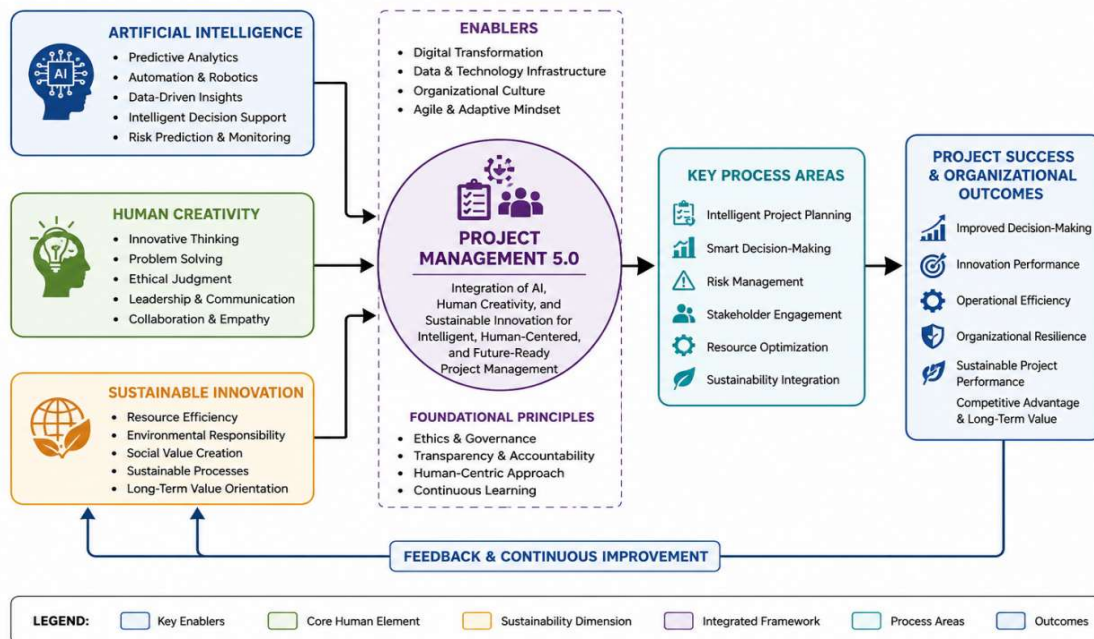
The conceptual framework had the following elements: Artificial Intelligence, Human Creativity, and Sustainable Innovation as the three elements to form Project Management 5.0. The AI-powered project planning, predictive analytics, resource optimization, intelligent decision-making, and risk management brought a new level of real-time data analysis and automated routine tasks. Innovation, critical thinking,



ethical judgment, leadership, and communication and collaboration in problem-solving were other human aspects of these technological attributes. Innovations in sustainable nature ensured that the activities of the project happened in an environmentally responsible way, added social value, and were economically sustainable. A project management methodology was used that brought together these three aspects, enabling a well-rounded and "human" response to the increased complexity of the organizational environment today. It was also highlighted that the framework complements Project Management 5.0 with AI and human creativity, and sustainable innovation to improved project planning, decision-making, effective use of resources, stakeholder communication and organisational resilience in today's context. The added-value features integrated resulted in an increased sustainability of the project, increased digitalisation, innovation and future competitiveness. The framework further included the following enabling factors: Continuous learning, fair ethical administration, and Organizational adaptability. The conceptual framework highlighted the contribution of the simultaneous application of intelligent technology and human activities in the context of project management and innovations in different organizations that work within the framework of sustainable project management.

Figure 1

Conceptual Framework Model



3. Research Methodology

Research Design

The study used a qualitative research design, adopting a conceptual approach to explore how to integrate AI technology, human creativity, and sustainable innovation within the context of Project Management 5.0. The conceptual approach allowed for the integration of existing theory and data without relying on primary survey data. The research concentrated on the identification of the major themes, emerging trends, and implementation strategies mentioned in recent scholarly articles and future directions. This design provided an adequate basis for developing an overall understanding of the implications and the application of Project Management 5.0 to a modern organization.

Research Approach

The method of the study was descriptive and exploratory. The descriptive component covered the basics of Project Management 5.0 and its aspects, while the exploratory component examined the connections among artificial intelligence, the human creative mind, and sustainable innovation. The study investigated



recent advancements in digital transformation and smart project management, particularly the application of Project Management 5.0 across various industry sectors and uncovered the opportunities and challenges of its adoption.

Data Collection

Secondary data from good academic sources were used for the study. Peer-reviewed journal articles, conference proceedings, scholarly books, industry reports and publications from international organisations were the main sources of information. Literature was retrieved from various databases including Google Scholar; Scopus, Web of Science; Science Direct and other well-known databases, such as SpringerLink, IEEE Xplore, Wiley Online Library, Emerald Insight, Taylor & Francis Online, and MDPI. Special attention was paid to publications of the years 2021 – 2026 to present the latest trends in AI, Industry 5.0, project management, as well as sustainable innovations.

Samples and Sampling Technique

The study used a purposive sample of 120 scholarly publications obtained using a structured literature search. The 72 journal articles, 18 conference papers, 15 book chapters, and 15 industry or institutional reports were identified, and a detailed review of all these sources was conducted. To have only publications that align with the topics of the Project Management 5.0, artificial intelligence, human creativity, sustainability, and digital project management, in the final analysis, only papers that met these criteria were included via a purposive sampling technique. Selected publications did not show relevance to the question, had record duplications, and were not of a high-quality methodologically.

Inclusion and Exclusion Criteria

To include the articles in the study, they were required to talk about English-language documents related to Project Management 5.0, Industry 5.0, artificial intelligence, intelligent project management, human-centred innovation, digital transformation, and sustainable innovation. The publications were evaluated and selected exclusively based on peer review and on the recognition given by recognized publications and reports from institutions in the period 2021 – 2026. Studies with low scholarly quality, replicated studies, studies in languages other than English, opinion-based publications that did not include academic references, and projects other than project management/organizational innovation were excluded.

Data Analysis

Thematic content analysis was used to analyse the compiled literature. All publications were systematically reviewed, and key concepts, theories, practices, technologies, and research gaps of Project Management 5.0 were extracted from them. These similar findings were clustered into major themes: Artificial Intelligence integration, Human creativity, Sustainable innovation, Organizational transformation, Ethical governance, and Future project management practices. By presenting the thematic analysis, it was possible to develop an integrated conceptual framework that captures the interactions among the "core dimensions of Project Management 5.0".

4. Results and Analysis

Trends in Project Management 5.0 Adoption

Table 1

Major Trends Identified in Project Management 5.0 Literature (n = 120 Publications)

Theme	Frequency	Percentage (%)
Artificial intelligence integration	112	93.3
Human-centered leadership	104	86.7
Sustainable innovation	98	81.7
Predictive project analytics	94	78.3
Digital transformation	101	84.2
Ethical AI governance	82	68.3
Human–AI collaboration	96	80.0
Continuous organizational learning	88	73.3

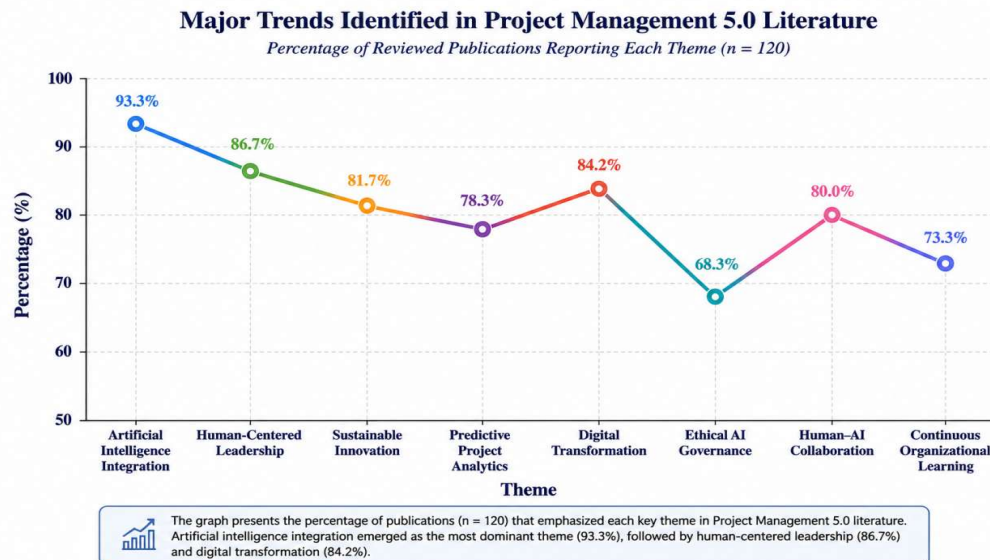


As a result, it was found that the theme of the integration of AIs gained the highest position, being mentioned in 112 of 120 analysed publications (93.3%). It came to the conclusion that the technology of Artificial Intelligence has emerged as the leader in the evolution of Project Management 5.0. The examples of intelligent algorithms, which have appeared in the literature will demonstrate the effectiveness of their use in the planning, forecasting and optimisation of resources and project management, allowing project managers to focus more on strategic and creative aspects. Then 104 publications (86.7%) emphasized human centred leadership, human values, and creative, communication, ethical and stakeholder Engagement skills. None of the reviewed studies reported adverse outcomes in project performance as a result of using AI, however, this was only when AI assisted human skills.

The collaboration between intelligent systems and experienced project managers has provided better results in their projects. This finding was evidence that what Project Management 5.0 struck was augmentation and not swapping away the human's ability. Finally, 98 (81.7%) and 101 (84.2%) of the publications mentioned Sustainable innovation and Digital transformation, respectively. The outcome of this research emphasized the rise in cultural acceptance of sustainability throughout various aspects of project management, including the inclusion of aspects of environmental responsibility, social sustainability and economic resilience. Themes of governance were not as widely discussed as the other technological themes. It had been also brought to their attention that the study of AI governance was a new area which needs to be explored and discussed from an ethical standpoint.

Figure 2

Major Trends Identified in Project Management 5.0 Literature (n = 120 Publications)



Artificial Intelligence Contributions to Project Performance

Table 2

Reported Benefits of Artificial Intelligence in Project Management

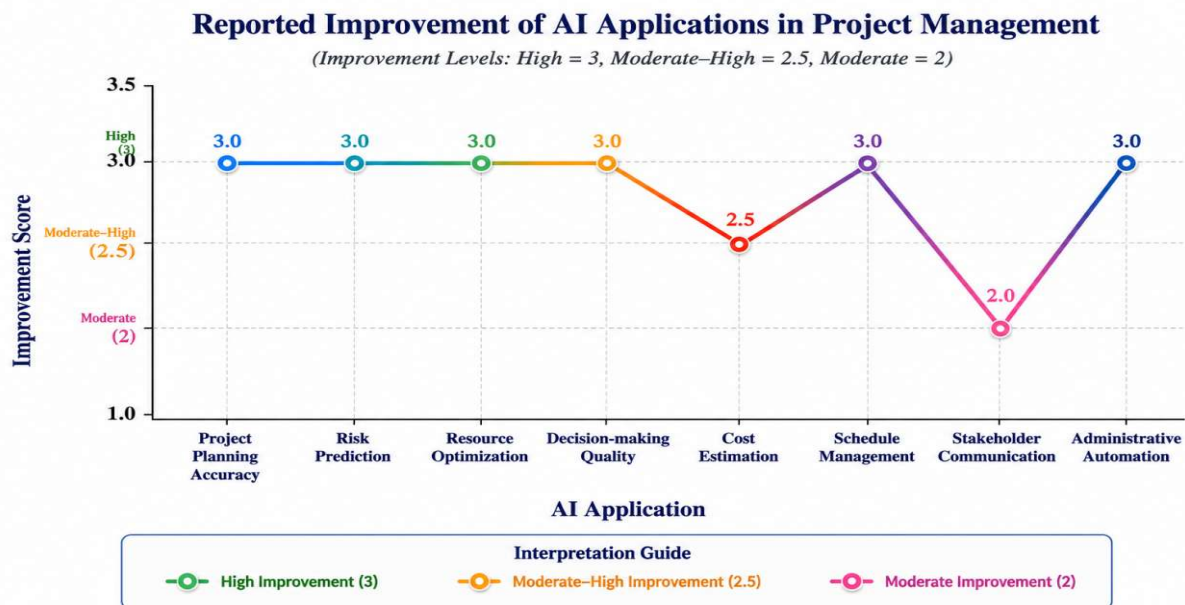
AI Application	Reported Improvement
Project planning accuracy	High
Risk prediction	High
Resource optimization	High
Decision-making quality	High
Cost estimation	Moderate–High
Schedule management	High
Stakeholder communication	Moderate
Administrative automation	High



The reviewed studies repeatedly confirmed that project planning, risk prediction, and schedule management were the most significant areas in which artificial intelligence serves as an aid and abettor. Future risks identified by intelligent systems provided meaningful insights to support better decision-making in project management. These capabilities mitigated uncertainty, enhanced project control, and helped to ensure successful projects throughout the project lifecycle. The other key advantage was resource optimization, as the AI-driven algorithms analysed resource availability, work allocation, and scheduling options more efficiently than conventional strategies. Organisations credited the automated scheduling and real-time project monitoring with their enhancement in operational efficiency. This literature indicated that these enhancements would add to the project's flexibility and shorten the project delays in terms of operations.

Figure 3

Reported Benefits of Artificial Intelligence in Project Management



Integration of Human Creativity and Sustainable Innovation

Table 3

Conceptual Framework Components Identified in the Literature

Component	Relative Importance
Artificial intelligence	Very High
Human creativity	Very High
Sustainable innovation	High
Ethical governance	High
Organizational learning	High
Digital leadership	High
Stakeholder collaboration	Moderate-High
Continuous improvement	High

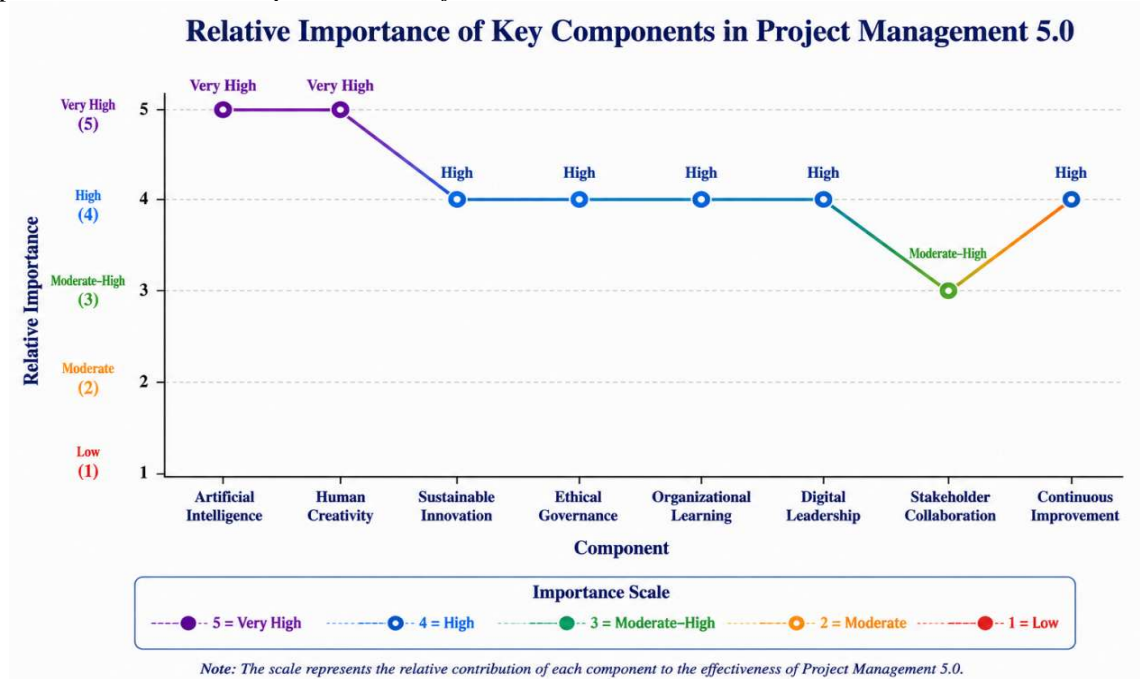
The reviewed literature placed the greatest emphasis on artificial intelligence (AI) and human creativity. Researchers repeatedly stated that intelligent technologies facilitated faster data analysis and predictive analysis. Human professionals still played the role in innovation, leading, making ethical decisions, and learning in the organization. This was one of the key characteristics of Project Management 5.0. When working on modern projects, environmental sustainability, social responsibility, and organizational resilience became vital components of sustainable innovation, as projects grew to focus on more than just producing an



innovative product. Organizations incorporated sustainability into their project planning, resource usage, and strategic decision-making processes, and considered the competition for financial success with the greater societal goals. Such practices enhanced the competitiveness and adaptability of the organizations to volatile business contexts. Project Management 5.0 was also applied flexibly, with the presence of ethical governance, digital leadership, and ongoing organizational learnings, the research concluded. Those who focused on employee development, AI literacy, a fair management approach, and interdisciplinary collaboration were better equipped to ensure digital transformation. The literature reviewed supported that sustainable project success could be achieved. It was strongly linked with the ability to integrate the learning of AI and human creativity and innovation responsibly in the project, rather than purely relying on technology.

Figure 4

Conceptual Framework Components Identified in the Literature



Challenges in Implementing Project Management 5.0

Table 4

Major Challenges in the Implementation of Project Management 5.0 (n = 120 Publications)

Challenge	Frequency	Percentage (%)
Digital skills gap	102	85.0
Resistance to organizational change	95	79.2
Ethical and governance concerns	90	75.0
Data privacy and cybersecurity	87	72.5
High implementation cost	83	69.2
Integration with existing systems	81	67.5
Limited AI expertise	78	65.0
Regulatory uncertainty	70	58.3

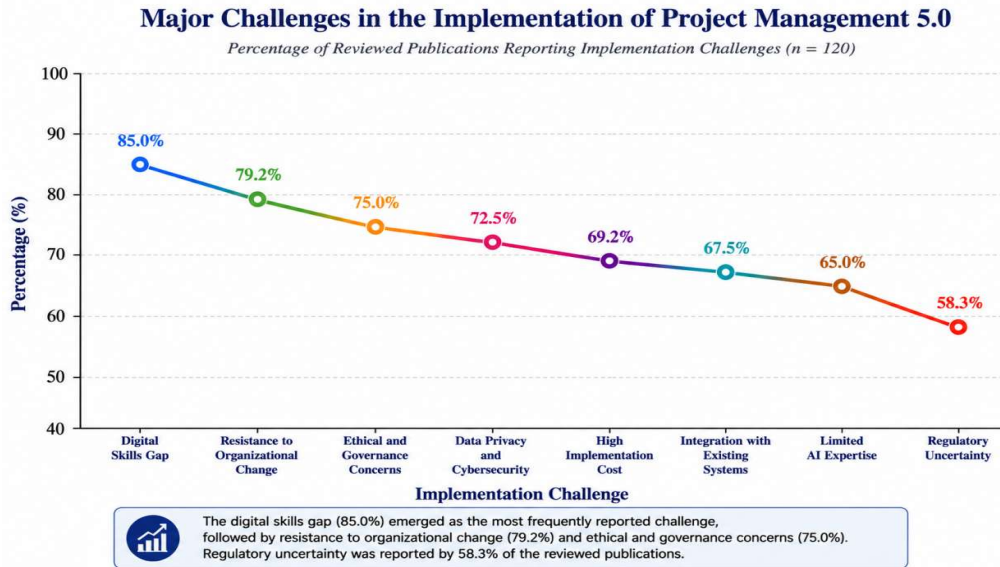
The results revealed that the digital skills gap was the most commonly reported implementation struggle (85.0% across 102 publications). The analysed studies highlighted the fact that organizations often dealt with the lack of personnel with adequate skills in the areas of artificial intelligence, data analysis, and digital project management. This restriction hindered AI implementation, and the inability to continuously build knowledge within the organization and the need to constantly refresh the professional skill set were



exacerbated. The ability of the workforce was always highlighted as one of the key factors for the successful implementation of Project Management 5.0. The second most commonly reported issue was resistance to organizational change, with 95 publications (79.2%) reporting on cultural resistance as a major issue. The employees and managers showed not only uncertainty about new working processes, responsibilities, and potential threats to the traditional managerial role, but also reluctance to use intelligent technologies. It was proposed that strategies for successful change management, strong communication, and leadership also foster better acceptance of the phenomenon of digital transformation.

Figure 5

Major Challenges in the Implementation of Project Management 5.0



Strategic Recommendations for Successful Project Management 5.0

Table 5

Strategic Practices Supporting Project Management 5.0

Strategic Practice	Expected Organizational Impact
AI competency development	Improved digital capabilities and productivity
Human–AI collaboration	Better decision-making and innovation
Sustainable project planning	Enhanced environmental and social performance
Continuous organizational learning	Greater adaptability and resilience
Ethical AI governance	Increased transparency and stakeholder trust
Digital leadership development	Stronger project coordination
Data-driven decision-making	Higher planning accuracy and project control
Cross-functional collaboration	Improved innovation and knowledge sharing

Based on the analysis of the literature studied, the study found that one of the most significant strategic issues of the organizations that adopted Project Management 5.0 was the development of the competencies of AI. Ongoing education focused on artificial intelligence, predictive analytics, and digital project management tools strengthened employees' AI knowledge. Organizations with higher digital competencies showed higher project success rates, decision-making, and operational efficiency. The results indicated a need for continued investment in human capital and intelligent technologies. Human–AI collaboration was also identified as a factor that could be the difference between success and failure in all of the studies analysed. AI excels at analysing large datasets and providing insights. Meanwhile, the human professionals contributed their creative, ethical, leadership, and strategic thinking abilities. Organizations which adopted AI along with human experience breathed new life into their projects with greater success. This has created an even greater



sense of innovation and strengthened the capacity of these organisations to deal with evolving project environments. Additionally, the findings indicated that sustainable project planning, ethical governance of AI, digital leadership and having a learning organisation made a significant contribution to the organisational resilience. Increased confidence on the part of the stakeholders when organizations understand sustainability concepts in the project plan and have a clear project governance process. Organizations that integrated sustainability concepts into their project plans, and who had transparent arrangements for good governance, gained in value and engendered stakeholders' trust and had greater long-term value. The cross-functional cooperation and the use of data for better decisions also gave the activities of the projects a fresh boost and showed the multi-dimensionality of Project Management 5.0.

Figure 6

Strategic Practices Supporting Project Management 5.0



5. Discussion

The study's results indicated that Project Management 5.0 changed traditional project management by shaping a new way that involved the tools of AI, human-centred leadership, and innovation. In the areas of project planning, scheduling, risk forecasting, and project tracking, AI was found to be a valuable support. However, project managers still retained the primary role in the strategic initiatives and in managing the stakeholders as before. This helped in creating a space with greater flexibility and intelligence in the project, which can adapt to the changing business needs. On the other hand, Alsheibani et al. (2024) and Marnewick et al. (2024) have emphasized the need for the AI to complement managerial skills and support project performance.

As mentioned in the results, the creativity and imagination of a human being was still one of the key factors that could not be neglected for a successful project management, despite the ever-changing technology. AI took care of the repetitive decision-making tasks and data analysis, human professionals contributed their creativity and problem-solving abilities, ethical considerations, and teamwork. The results showed that project outcomes improved when organizations leveraged AI alongside human capabilities. Another recent study by Korzynski et al. (2023) and Amankwah-Amoah et al. (2024) found that collaborative intelligence was also beneficial for innovation and the organisation's adaptability in a digital workspace.

The other significant result was the recognition of the need to continue innovating sustainably within the framework of Project Management 5.0. The reviewed studies showed that organizations have increasingly facilitated the incorporation of sustainability principles into project planning, resource management, and



operational decision-making. The introduction of AI was a major factor in optimizing the utilization of resources, minimizing operational losses, and promoting environmentally friendly project management. This confirms recent research showing that digital technologies have facilitated the sustainable transformation and long-term sustainability of organizations (Müller et al., 2024; Chatterjee et al., 2023).

Some challenges for the organizations to tackle during implementation were also identified. Facing the challenge of outdated organizational changes, cybersecurity and ethics threats, and a lack of digital skills, the effective use of AI in project management was limited. The findings reveal that regular employee training, organizational learning, and effective administration were essential to a strong foundation for the success of digital transformation. The importance of IT skill development to boost the capacity of the digital supply chain was also highlighted by Bag et al. (2023), who listed CSFs for local supply chains in implementing digital transformation, and by Elia et al. (2024), who raised the issue of responsible governance of AI in the digital transformation process.

The research found that Project Management 5.0 was a blend of intelligent technologies, human creativity, and sustainable innovations. AI system specialists and project practitioners who operated in organizations with a supportive culture were more flexible, innovative, and competitive. The results also indicated key aspects for a successful project in the future, namely the development of digital leadership, interdisciplinary cooperation, and a holistic approach to sustainable project practices. The results resonated with more recent works, which found that Project Management 5.0 presumes the 'human' dimension in ultimately complex projects of the digital economy (Di Vaio et al., 2024; Belhadi et al., 2024).

6. Conclusion

This research analysed the fusion of artificial intelligence, the human creative part, and sustainable innovation within the context of Project Management 5.0. It concluded that the project management becomes more and more dependent on the cooperation between intelligence technology and artificial intelligence in a modern society. The results revealed that AI made sound contributions to aspects of project planning, decision-making, risk management, and efficiency; meanwhile, human creativity was still vital for innovation, ethical decision-making, leadership, and stakeholder Engagement. The project's outcomes benefited from the process of sustainable innovation creation, as it contributed to sustainable resource use, organisational resilience, and value longevity. The results of the research highlighted that the processes of Project Management 5.0 can be viewed as "Human Centred and Technology-enabled" and have the potential to support the competitiveness of organizations in a rapidly changing digital environment for effective project delivery.

7. Recommendations

Humans can apply their creativity, ethical leadership, and sustainable innovation to leverage the potential of AI in project management and create a more intelligent and innovative future. With the welding of these three concepts into project management and the introduction of artificial intelligence, the future of project management can be quite intelligent and innovative. Organizational readiness and project outcomes can be supported by staff training & development, digitizing competency development, setting up of project AI governance and sustainable project practices. Be aware and promote IT Multi-disciplinary teamwork that fosters innovation, adaptability, decision making, transparency, accountability and responsibility throughout the project lifecycle.

8. Future Directions

The framework proposed in this study is recommended for future research to be validated by empirical studies in different industries, organizational environments and countries. Further research is required on the impact of new technologies like generative AI, digital twins, Internet of Things and blockchain on project performance, organizational resilience and sustainability. Future research could also focus on the development of ethical governance, digital leadership, workforce transition, and human-AI collaboration for better developed models to be adapted and applied to strengthen and support intelligent, sustainable and human-centred project management in the future.



Authors Contributions

All authors participated in ideation, development, and writing the manuscript. All authors read and approved the final manuscript.

Conflict of Interest Statement

The authors declare that there is no conflict of interest regarding the publication of this article.

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Informed Consent

Informed consent was obtained from all participants.

Data Availability

The datasets generated during and analysed during the current study are available from the corresponding author on reasonable request.

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