American Journal of Artificial Intelligence and computing

ISSN : 3067-8293
Volume 1, Number 2, 2025
https://doi.org/10.70445/ajac.1.2.2025.164-182

Artificial Intelligence and Project Management: An Integrative Review of Current Approaches and Future Directions

Muhammad Shahrukh Aslam[1*]

[1]Concordia University Chicago

[1]shahrukhaslam81991@gmail.com

open access

Corresponding Author
Muhammad Shahrukh Aslam
shahrukhaslam81991@gmail.com

Article History:
Submitted: 11-07-2025
Accepted: 18-08-2025
Published: 23-08-2025

Keywords:
Artificial Intelligence, Project Management, Automation, Future Directions, Predictive Analytics.

ABSTRACT

Artificial intelligence (AI) is already changing the face of project management due to its ability to boost processes involved in project planning, project execution, project monitoring, and project decision-making. The paper will discuss the basis of the use of AI in project management, and will consider the ways in which it is used today in project management in the form of scheduling, resource optimization, risk prediction, communication, performance tracking. Some of the advantages connected with AI incorporation include a higher level of accuracy, efficiency, cost-saving, and more substantial stakeholder cooperation. Issues like data quality, ethical issues, high expenses, and reluctance to use present a challenge to the realization of widespread implementation. Two possible future directions are emerging technologies such as generative AI, digital twins and autonomous agents, all seemingly well-suited to complement IoT, block chain, and cloud platforms. The review demonstrates unaddressed research gaps in some series of empirical validation, sector-specific applications, ethics and skill development, and the need to create a balanced human-AI working relationship to meet goals of sustainable projects.

American Journal of Artificial Intelligence and computing
ISSN : 3067-8293
Volume 1, Number 2, 2025
https://doi.org/10.70445/ajac.1.2.2025.164-182

INTRODUCTION

Project management has been identified as an important field of study in ensuring a successful execution of an initiative across industries. Project managers are involved in working in construction and manufacturing, information technology and healthcare, all with a common theme: projects that must be planned, executed and monitored with the constraints of time, cost, and quality. Conventionally these tasks have been depending on human decision and manual planning, as well as traditional computer applications [1]. As the use of digital technologies accelerates, however, project management practices are experiencing a paradigm shift and AI has been identified as one of the most disruptive players in the transformation of project management practices.

Artificial intelligence, in a broad sense, or the ability of the machine to imitate human mental activities of learning, reasoning, and solving problems, has entered into almost every professional domain. AI can be used in project management so that it can automate some routine jobs and supplement decision making and give predictive analysis that far exceeds traditional tools ability [2]. It allows using AI to process large volumes of structured and unstructured data, predicting risks, proposing allocation strategy approaches, and even modeling project outcomes in the light of alternative scenarios. This is what makes AI not only a supportive, but strategic enabler of efficiency, accuracy and agility in project management [3].

The complexity of projects is another reason resulting in AI adoption. Globalization and remote and hybrid work models in combination with the fast changes in the market conditions mean that projects today include the involvement of more people, cross-border collaboration, and shorter deadlines than ever. Human managers tend to lag behind in digestions of the magnitude of data and variables that entail such projects when acting alone [4]. More AI technologies, including machine learning (ML), natural language processing (NLP), and predictive analytics can help solve the problem by injecting real-time insights into the system, automating routine tasks, e.g., scheduling or reporting, and allowing proactive operation instead of reactive responses to the problems [5].

In addition to the pressure to deliver the projects as planned in terms of the time and cost scale, there is growing pressure on organizations to come up with value addition and innovation in the projects. AI allows project managers to get out of administrative demands and into more advanced strategic roles like stakeholder relations, managing innovation and organizational alignment. The examples of how such AI-based tools can be used in practice include auto-generation of reports, recognition of productivity patterns in the team, and even anticipating the very conflicts before they get out of control to ensure that managers can spend more time learning, leading, and making decisions [6].

Yet it seems that progress towards the implementation of AI in project management is underway,

ISSN : 3067-8293
Volume 1, Number 2, 2025
https://doi.org/10.70445/ajac.1.2.2025.164-182

although tentative. A lot of organizations experience difficulties due to cost, availability of data, technical skills and the ethical aspect. The hype of AI also spreads unrealistic expectations, which come to weigh it down to the reality of real application. These considerations explain why it is important to review critically the existing methods, advantages, shortcomings and opportunities of AI in project management [7]. The aim of this article is to conduct an integrative review on the use of the AI in project management, benefits of its use, possible challenges of its usage, as well as future research and practice. Through synthesizing existing literature and identifying emerging trends, the review intended to provide opportunities to understand the paradigm-shifting power of AI within the framework of the project management sphere to the academic community and practitioners [8].

BASIS OF AI IN THE FIELD OF THE PROJECT MANAGEMENT

The concept of AI in project management is based on a platform of computational methods, algorithms and technologies which increase or even replicate human decision making. In order to realize the contribution that AI can bring to the project management process in full, one first should grasp the fundamentals of AI and map them to the requirements of project management practice. This section presents the main principles of AI, outlines the most important technologies of them which can apply to project management and traces the development of AI introduction into the field [9]. Automation implies the processing of routine or rule-driven action with only minimal human involvement. Examples include updating the project schedules automatically, sending reminders and generating progress reports. It is the ability to predict something based on algorithms that learn through an accompanied history of facts. In project, predictive analytics can assume measures of time that a project can be completed with relative degree of precision [10].

Optimization is concerned with the discovery of the most effective solutions under a set of constraints. An example would be that AI could provide optimal strategies regarding using resources or implement a change in workflow so as to limit delays. They are corollaries of the requirements of contemporary project management, where efficiency, foresight and adaptability are paramount [11]. ML facilitates systems to learn on the basis of previous project data, finding regularities and relationships that may be missed by human beings. As a case-in-point, ML models can aggregate knowledge obtained in prior projects to forecast which tasks are likely to result in bottlenecks [12].

With NLP, AI is capable of comprehending and processing human linguistics. In the project management context, NLP is used to drive chatbots, virtual assistants, and communication analysis tools capable of summarizing meeting notes, deriving stakeholder feedback, or sentiment in team-wide communications. Using data analysis tools and models, predictive analytics anticipates what will happen in the future, be it project risks or a pattern of performance. This would be particularly

American Journal of Artificial Intelligence and computing
ISSN : 3067-8293
Volume 1, Number 2, 2025
https://doi.org/10.70445/ajac.1.2.2025.164-182

handy in early-warning systems that would help the managers take precautionary steps. These AI programs perform the exact thinking of human specialists through rule-based logic [13]. In project management, they can be utilized to assist in making decisions that pertain to contract evaluations or compliance assessments.

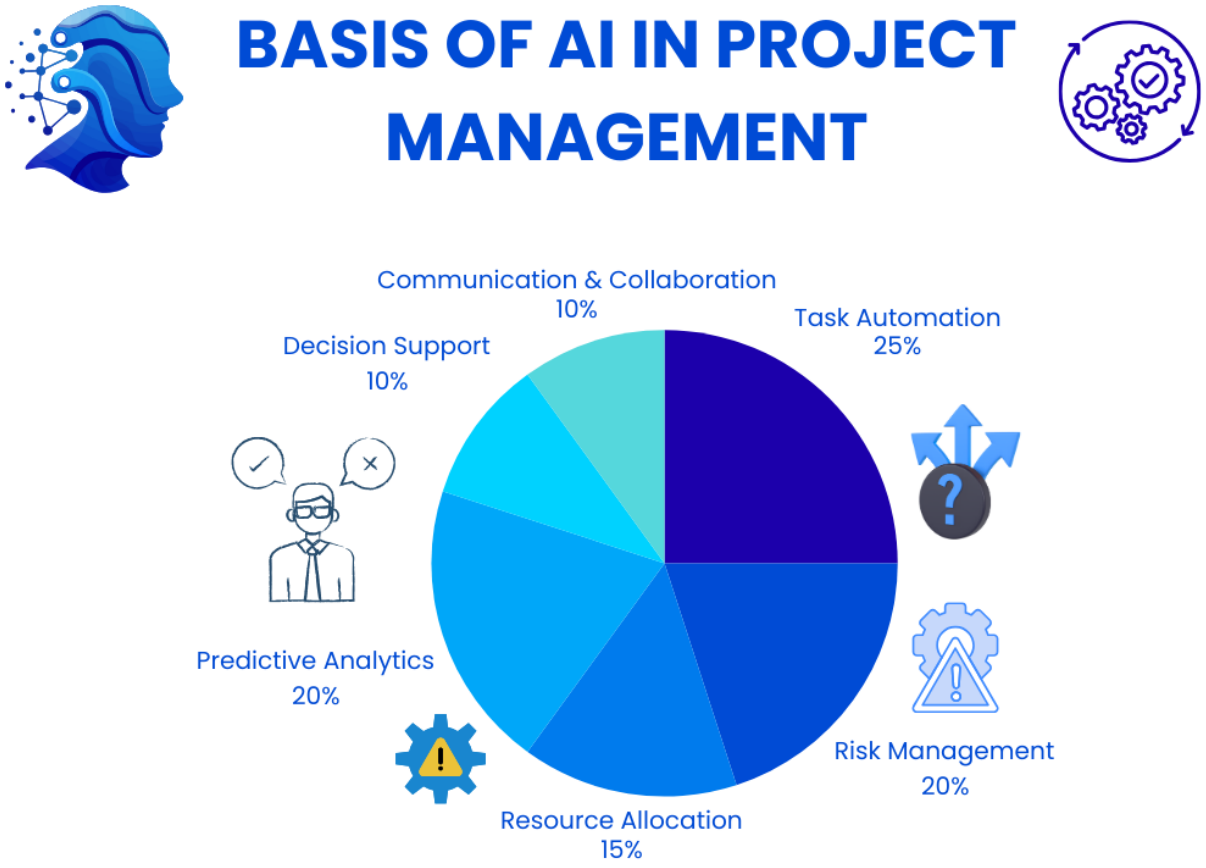

Figure: 1 showing basis of AI in project Management

RPA automates repetitive tasks that are structured (document processing) and reduces administrative overheads, freeing up time to the project managers. These are systems that go further to rule based models to model the reasoning of people by first considering context and uncertainty. They aid in decision making by managers when such choices involve multi-variables. Artificial Intelligence has entered project management in smooth phases reflecting on the general trend of technology [14]. The early adaptors of the digital tools included the spreadsheets and standalone project management programs available to project managers. Such tools were mostly manual with nearly no dynamic reporting. As computing capabilities increased and advanced in the late 20 th and early 21 st centuries, more complex project management software tools became possible including automated schedule generation, resource allocation, and dashboard tools [15].

The real game-changer was through the emergence of the big data and cloud computing in the 2010s.

ISSN : 3067-8293
Volume 1, Number 2, 2025
https://doi.org/10.70445/ajac.1.2.2025.164-182

These technologies have furnished the foundation of AI in terms of assessing big volumes of project-related information in real-time. AI-supported applications started providing predictive capabilities where users could use historical project outcomes to analyze risk. The growing prevalence of collaboration technology, such as Slack, Microsoft Teams, and Asana created more opportunities to use AI to improve communication and coordination [16]. The condition of AI applications in project management becomes one step further than automation to high-level decision-support systems. Smart platforms are able to connect to existing enterprise systems, learn about a project as it proceeds and give advice relevant to that particular project. This is a change to AI being a benign assistant to AI being an active partner in project leadership [17].

An appreciation of these premises underscores the fact that AI is not a technological enhancement but a strategic enabler The isomorphism of automation, prediction, and optimization resolves the three pain points relating to project management, i.e., inefficiency, uncertainty and resource constraints. By upgrading to AI, the new project managers will be able to make more informed decisions that rely on data, experience greater productivity and get ahead of issues before they become escalated. Simultaneously, these foundations indicate that AI is not intended to substitute project managers instead of empowering them [18]. By relieving managers of the cumbersome administrative tasks and being able to offer effective insights, AI enables managers to concentrate on long-term strategic planning, innovation, and managing stakeholders- places where human experience and interpersonal skills are still unsurpassable [19].

EXISTING PROJECT MANAGEMENT APPLICATIONS OF AI

The implementation of artificial intelligence (AI) on project management has progressed beyond talking potential into tangible real-life practical implementation. At present, AI-powered software tools are being used to help organizations in their industry to plan, execute, monitor, and evaluate a project. Some of the most important areas in which AI is currently being used in project management are highlighted as follows. Accurate schedules are created and aligned with available resources which is one of the most time -consuming aspects of project management. AI optimizes this by looking at past project data, and determining patterns and providing an estimate of anticipated delays [20]. Sophisticated scheduling algorithms are able to reprogram schedules automatically as a result of modifications in scope, resource availability, or unseen disruptions. This enables the project managers to be flexible and resilient in planning without a large margin of error.

Resource utilization is a key to a successful project. Optimization models are used by AI tools to advise on ways of allocating human, financial, and other forms of resources in the best possible manner. As an example, AI can help to figure out underutilized employees, the need to alter the roles,

ISSN : 3067-8293
Volume 1, Number 2, 2025
https://doi.org/10.70445/ajac.1.2.2025.164-182

or outsource some of the tasks [21]. These AI systems also continue to monitor progress and performance and reallocate resources in real-time as necessary to achieve efficiency. Not only is this a boost to productivity, but also help cut down on costs that may be incurred due to mismanagement or over allocation [22].

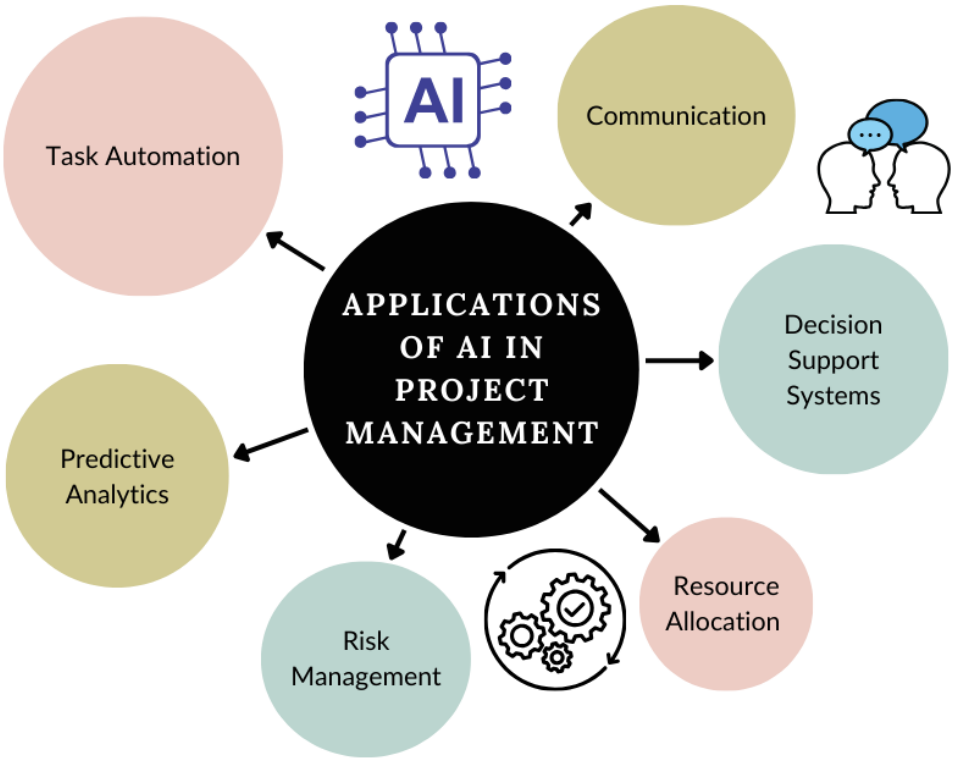

Figure: 2 showing applications of AI in project management

Risk management has been done based on experience and intuition of the project managers. AI enhances this process by bringing data-driven insights to it. Machine learning can study past projects and the current situation to predict the possible risks, like budget overruns, plan delays, or poor quality. Certain AI tools will even give a what-if analysis, where managers can speculate future scenarios and judge the outcomes. It is this prediction ability that permits proactive risk management as opposed to reactive problem solving [23].

The modern-day work environment is characterized by project teams that are geographically distributed, and operate through hybrid or remote work. AI facilitates teamwork because of the virtual assistants, chatbots, and natural language processing tools that support the process of communication. Take, for instance, AI may be used to automatically create meeting summaries, extract action items or scan through communication patterns to identify potential conflicts or decreasing involvement [24]. Such insights enhance team organization, limit miscommunication, and increase clarity in

American Journal of Artificial Intelligence and computing
ISSN : 3067-8293
Volume 1, Number 2, 2025
https://doi.org/10.70445/ajac.1.2.2025.164-182

stakeholders.

Another aspect where AI is usefully applied is monitoring the performance of projects reporting is slower in the traditional approach, as it involves manual steps in data collection and analysis, which are likely to be error-ridden. Dashboards powered with AI do provide the real-time insights as they receive the information directly through the project management tools and collaboration systems. These dashboards do not only show the progress but also reflect anomalies or deviations to the plan [25]. Additionally, AI will be able to suggest corrective actions which will help managers stay in control of the project outcomes.

BENEFITS OF AI INTEGRATION

AI is transforming the process of project management through simplifying the planning process, maximizing the use of resources, downsizing risk projections, enhanced teamwork, and automating the tracking of performance. Although this adoption of AI is at different levels across industries, the recent applications of the technology are examples of how it can promote efficiency, accuracy, and decisions related to the management of complex projects [26]. The incorporation of artificial intelligence (AI) in the project management process provides numerous benefits to the process that makes it more efficient and effective when it comes to the goal attainment.

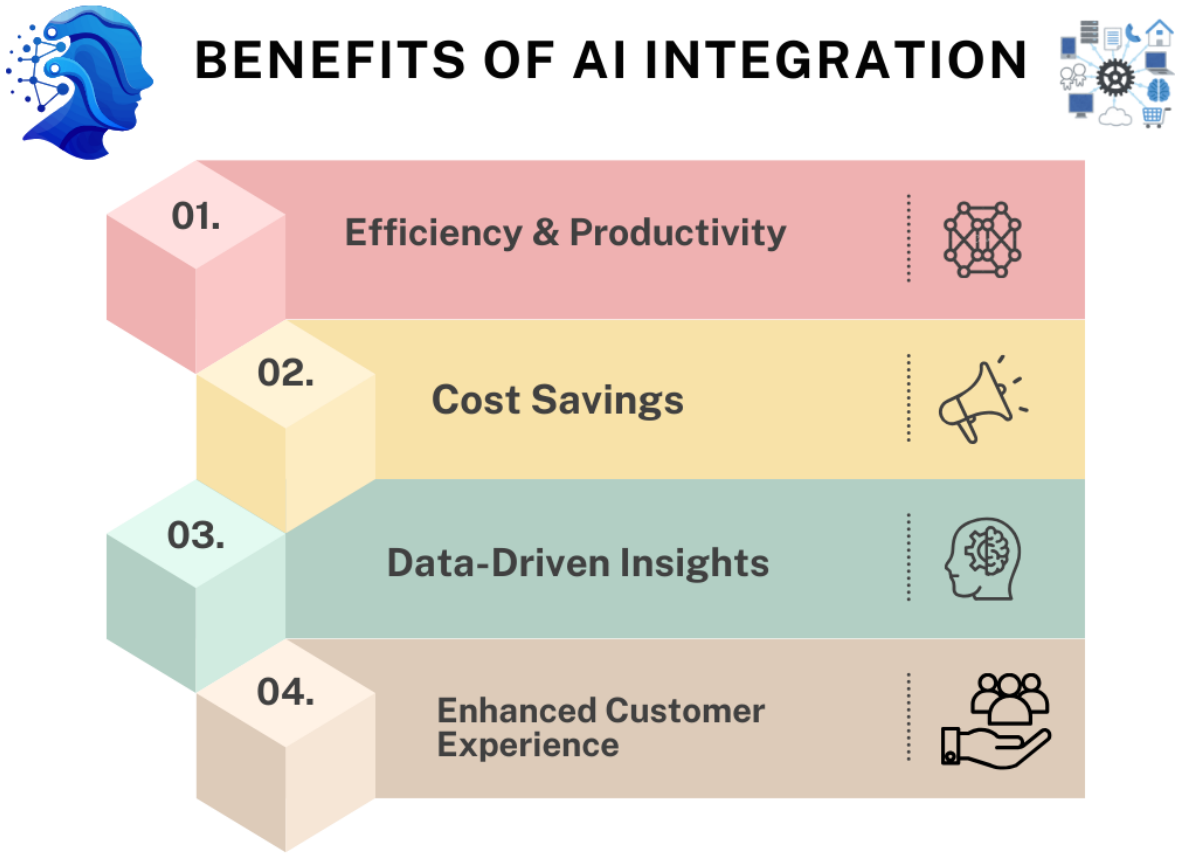

Figure: 3 showing benefits of AI integration

ISSN : 3067-8293
Volume 1, Number 2, 2025
https://doi.org/10.70445/ajac.1.2.2025.164-182

Automation of routine operations, deliverability of predictive data, and support of data-driven decisions are only some of the ways in which AI is redefining how projects are planned, executed, and tracked. Significant advantages of AI application to project management are discussed in the following sections [27]. Managing the project involves continual decision making which is usually fraught with uncertainty. Traditionally, they relied more on human judgment which may be biased, lack adequate information or/and be subjectively interpreted. IT alleviates such drawbacks by processing large volumes of project-related information and providing evidence-based perceptions. Forecasts made by predictive models may identify risks, estimate the timing of the work, and predict cost overruns so that managers can undertake more informed decisions. This will lead to higher accuracy and consistency thus minimizing the possibility of failure of the projects [28].

Among the most immediate benefits of integrating AI, instant ability to automate the number of repetitive administrative operations deserves to be highlighted. AI-based systems can manage activities including scheduling, updates to timesheets, task reminders as well as report generation, which can be a huge weight off project managers. This saves a lot of time and managers can concentrate on other issues of greater responsibility like strategic planning, engagement to stakeholders and leadership [29]. Automation also eliminates human error hence, there will be increased reliability in the project documentation and report.

Communication is an essential element in project success especially when it is a complex project or a project involving multiple stakeholders. AI tools facilitate communication by creating automated synopses of staff meetings, monitoring the concerns of the stakeholders and offering sentiments analysis of team discussions. This will enable the managers to deal with any potential conflicts as soon as possible [30]. Moreover, in order to enhance the transparency and mitigate possible miscommunication, the development of AI-powered chatbots and virtual assistants may facilitate the provision of stakeholders with real-time updates. The end result is an enhanced cooperation and synergy amongst project stakeholders [31].

Besides the operational value, AI offers strategic value such as making project management roles more prominent in organizations. By creating new ideas and making mundane tasks robotic, AI enables a project manager to become a strategic leader as opposed to an administrator. Such a movement leads to innovation, closer alignment toward organizational goals, and more competitive advantage [32]. The value of AI in column zrm in project management goes beyond operational enhancements (like automation and efficiency) to the strategic benefits (improving decision-making and proactive risk management). These are more benefits not only that enhance the probability of success of the project, but they also enhance the total contribution of project management to

American Journal of Artificial Intelligence and computing
ISSN : 3067-8293
Volume 1, Number 2, 2025
https://doi.org/10.70445/ajac.1.2.2025.164-182

organizational development and the innovation capabilities of the organization [33].

CHALLENGES AND LIMITATION

Artificial intelligence (AI) has many potential benefits to project management implementation; however, there are some difficulties and limitations to consider when including it in project management. Some of these issues are caused by technological requirements, organizational factors, ethical considerations, and economic ones that may complicate implementation and restrict the overall potential of AI. It is critical to acquire the needed knowledge of such barriers in order to make the adoption successful and achieve the balance between innovation and reality. AI systems are highly dependent on high quantities of precise and trustworthy data in order to operate efficiently [34]. Data in project management tend to be disjointed or not consistent and complete. As an example, various departments can use different tools or platforms, and it is hard to aggregate project-related information.

Along with this, historical data in project may not be sufficient to provide details needed to train AI models and may produce inaccurate results or biased outputs. In the absence of good-quality data, the information presented by AI can misguide the managers instead of helping them [35]. The other restriction is on ethical entailments of AI adoption. The AI systems in project management tend to process sensitive information about the employees like their performance data, communication styles, or workloads. This brings to the fore the issues of privacy, data security and illegal use of personal information. The employees can also fear that they will be under scrutiny all the time due to the AI tools, which could cause resistance and less trust [36]. To overcome such a conflict between effectiveness and respect of privacy, easy-to-understand ethics and transparent processes are thus required.

This is because whether integration of AI would succeed would depend not only on whether it is tech-ready but also whether it is embraced by the organization The team members and the project managers will view AI as a threat to their jobs; they feel that the AI might end up taking over the human decision factor or skill in the management [37]. When in reality, AI is intended to assist project managers and not usurp their role but the lack of understanding of the role of AI may create resistance. To overcome this challenge, there should be strong change management plans, communication efforts, and training that will enable trust and confidence of using the AI systems [38].

A current problem is the need to avoid over-trusting AI systems or to have unrealistic expectations of their capabilities. Although AI may make useful forecasts and automate a number of tasks, it is not error-proof. There is still a need to use human judgment, creativity, and leadership to succeed in a project, which is incapable of AI. Relying on the outputs blindly without critically thinking or

ISSN : 3067-8293
Volume 1, Number 2, 2025
https://doi.org/10.70445/ajac.1.2.2025.164-182

analyzing the AI can be dangerous, creating a bad decision or side effects [39]. Technical aspects (data quality and interoperability), organizational challenges (resistance to change), and more general considerations (ethics, privacy and cost) are presented as part of the challenges to AI in project management. It is necessary to balance thesees limitations by means of technological innovation and effective policies, leadership, and a dedicated focus to human-AI collaboration [40].

FUTURE DIRECTIONS

The implementation of artificial intelligence (AI) in project management is still fledgling, however, with current improvements, it can be expected that in the future the changes will only be more impactful. With the development and introduction of AI technologies and organizations being more confident in their implementation, the role of AI will grow beyond any doubt as a supportive element in managing complex projects, to that of an essential of such process [41]. When looking at the prospects of AI in project management, it is possible to explore several dimensions, including technological innovation, connection to new digital environments, human-AI interaction, and project management skills development pursued [42].

In construction or manufacturing, real-time information coming out of sensors and smart gadgets can be used as real-time input to AI models that constantly monitor project progress. Block chain combined with AI could increase project transparency and trust in transaction, contracts, and delivery. AI-based smart contracts would allow the automatic enforcement of contracts. Cloud platforms will allow the storage and analysis of huge volumes of data and therefore AI will operate globally in project teams [43]. Such a fusion will result in smarter, interlocking project ecosystems with data-driven, very flexible decision-making.

Instead of a direct replacement, AI systems will be used as project support tools that supplement its human counterparts. The project managers will increasingly use AI to provide them with insights and recommendations as well as free up their time to automate tasks, but they will keep their leadership, critical thinking, and interpersonal skills that machines lack. The transition will result in a new hybrid project management format where repetitive work can be taken off human hands with the help of AI and focus on business strategy, innovations, and stakeholder communication will remain a human sphere of responsibility [44]. The cooperation will bring new definitions of the role of project managers who will no longer be an administrator but a strategic leader.

Moving into the future, AI will cause project management to become proactive and predictable. Managers will be in a position to foresee the occurrence of risks and delays as opposed to reacting to them after their occurrence. Such ability to be proactive will not only raise the success rate of the projects but also shed their alignment to the strategic organizational objectives, future

ISSN : 3067-8293
Volume 1, Number 2, 2025
https://doi.org/10.70445/ajac.1.2.2025.164-182

competitiveness and innovation through project management [45]. The trend of the future of artificial intelligence in project management is the further integration of technology, enhanced use of human-Artificial Intelligence collaboration, and a broader role of the manager as a strategic leader. Adopting such directions, organizations will open new horizons of efficiency, future-sightedness, and innovation in project delivery [46].

RESEARCH GAPS AND OPPORTUNITIES

Even though artificial intelligence (AI) has been revealed as a huge potential in terms of project management, the sphere is not indeed a subject of much exploration both scholarly and practically. Existing research points to the positive aspects of the application of AI, but there are some important gaps that should be addressed to achieve the full potential in this field. The identification of these gaps also points to possibilities of conducting further research, developing innovation, and coming up with best practices [47]. Much of the body of knowledge on AI in project management has been based on conceptual or exploration-based research studies.

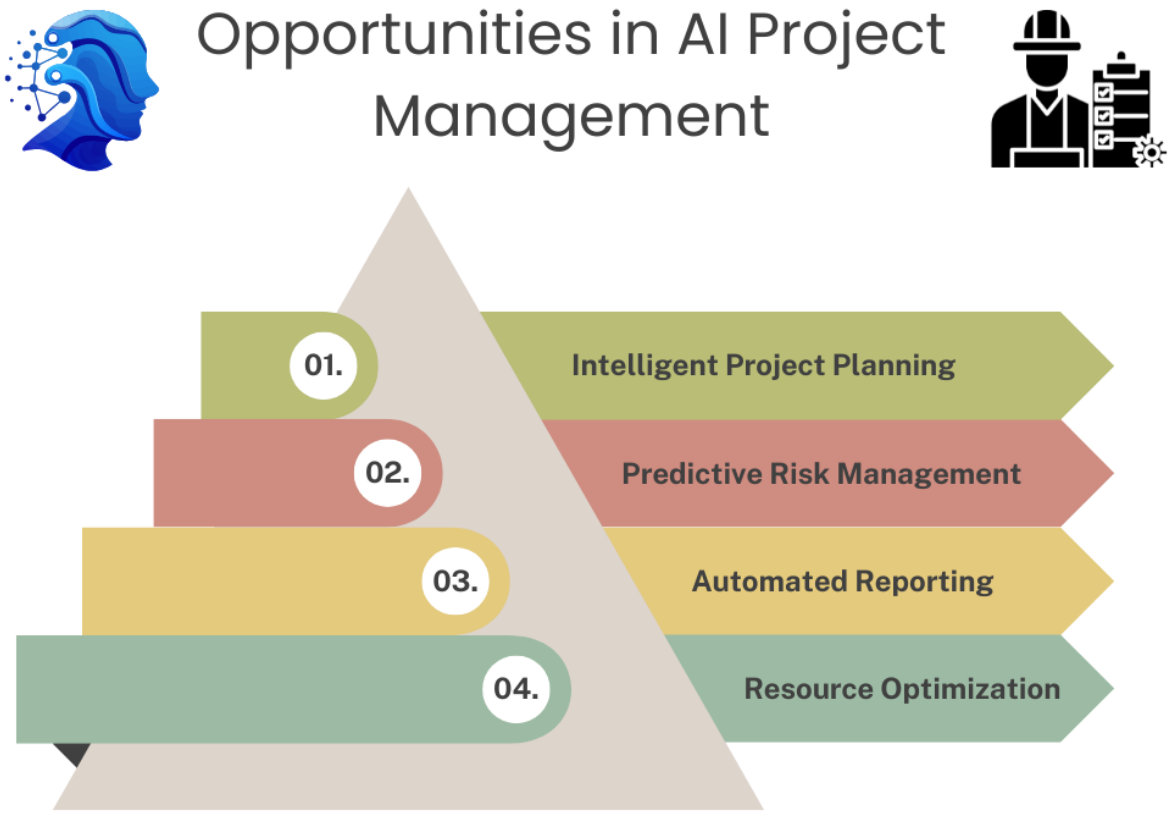

Figure: 4 showing opportunities in AI project management

Case studies and theoretical deliberations are important but lacking is an empirical research study that can evaluate the real-life result of AI tools in project conditions [48]. As an example, the number of studies that measure various improvements in efficiency, cost savings and/or project success rates directly resulting to the use of AI is minimal. Research in the future should aim at gathering both

ISSN : 3067-8293
Volume 1, Number 2, 2025
https://doi.org/10.70445/ajac.1.2.2025.164-182

qualitative and quantitative information on industries that have already adopted AI in their work and continue to prove the argument of its performance [49].

The existing studies speak about AI application in the sphere of project management (in general, without elaborating on sectorial specificities). Nevertheless, industries, including construction, healthcare, IT, and finance are some of the industries that differ greatly in terms of the challenges and requirements of project management. As an example, construction projects can be enhanced with predictive risk forecasting utilising drones and the Internet of Things sensors, whereas IT projects might need predictive analysis over bugs and sprint planning [50]. The next improvement could be the creation of AI applications specific to certain domains, as well as the evaluation of the advantages and possible drawbacks in each particular area.

There is little literature on ethical and legal considerations, in spite of the fact that the technical discussions lead the literature. The issues of privacy of employees, bias of algorithms, responsibility of decision-making, and adherence to data protection regulations have not been sufficiently dealt with. Further studies are needed to explore ethical use-cases of AI in project management and develop some guidelines that incorporates both innovative and responsible use [51]. One of the gaps is the lack of knowledge how the project managers and AI systems can work with each other in an effective way. Previous studies tend to think of AI either as a means of supplementing human labor or as a complete substitute, leaving open less hybrid ideas of human-AI interaction. Researching trust building between the managers and the AI systems, decision making together and redefining the roles will also be important in achieving the best of AI [52].

MATICAs the use of AI increases, project managers will also need additional skills, including data literacy, digital fluency, and ethical awareness. Yet, limited work has been done on how schools and professional organizations can re-engineer training programs to address such new demands. The current situation on exploring effective training models becomes a major opportunity to the collaboration of academia and industry [53]. There are high hopes that AI can be used in project management, important gaps are left in terms of empirical confirmation, specialized industry procedures, ethical issues, collaboration methods, and skills preparation. Filling these gaps is an opportunity to influence the future of AI-enhanced project management in a responsible and meaningful manner on the side of researchers, practitioners and educators alike [54].

CONCLUSION

The introduction of artificial intelligence (AI) in project management is one of the most drastic changes in the sphere over the past few decades. In increasingly complex projects and when the pressures faced by organisations to deliver value are within tighter constraints, AI presents tools and

ISSN : 3067-8293
Volume 1, Number 2, 2025
https://doi.org/10.70445/ajac.1.2.2025.164-182

solutions that can fundamentally transform the way projects are planned, conducted and controlled. This review has indicated the advantages and weaknesses of adapting AI, its applications today, directions it is taking, and what needs to be worked on.

The role played by AI in management projects is varied. Automation alleviates repetitious functions, like scheduling, reporting, and data entry, to enable more time to be dedicated to strategic leadership by the project managers. It can forecast risks more accurately than before and allocate the correct amount of resources needed to minimize performance issues. Coming to transparency, efficiency, and alignment with the project aims, AI also helps in the communication and collaboration and cooperation among geographically distributed workers. The sum of these contributions enhances not only the organizational outcomes of the projects but also the role of project management within the organizations as a whole.

Meanwhile, the incorporation of AI is not an easy task. Poor data quality, moral questions, elevated costs of implementation, and change obstruction may slow down AI systems. Furthermore, the absence of standardization and empirical studies hamper the ability to outline the best practices to follow across industries. The solution to these challenges must be carefully balanced between technological innovations and careful consideration of organizational approaches, ethical systems and investment in the preparedness of the workforce.

Taking a prospective step, it is assumed that the opportunities of AI in project management will diversify greatly. With the emerging technologies like generative AI, digital twins, and autonomous agents, project execution, planning, and decision-making are dominated more. New combinations of AI with other modern technologies---block chain, cloud computing, and the Internet of Things---will allow the creation of intelligent ecosystems able to process projects with more efficiency and adaptability than ever before. Nevertheless, the effectiveness of such technologies will rely on how to enable efficient human-AI cooperation as a combination of AI and human expertise being not a replacement but a complement. A much more critical point, though, is a need to train project managers to work in this changing environment. The acquisition of data literacy, digital fluency, ethical awareness, and adaptive leadership will also be major factors in enabling professionals to take advantage of AI and still retain all of the human qualities of judgment, creativity, and empathy that will continue to be essential to project success.

AI has got vast potential in revamping project management to opportunity driven, proactive and strategic functions that will propel competitiveness and innovation within organizations. To achieve this potential, it is not enough to accept AI technologies but also to overcome the shortcomings of those, aligning and restraining them to the human expertise. It is only by achieving such a balance,

ISSN : 3067-8293
Volume 1, Number 2, 2025
https://doi.org/10.70445/ajac.1.2.2025.164-182

that companies and project leaders will be able to achieve a new height of efficiency, perspicacity and creating value in projects of the future.

REFERENCES

[1]. M. C. Lee, H. Scheepers, A. K. Lui, and E. W. Ngai, "The implementation of artificial intelligence in organizations: A systematic literature review," Information & Management, vol. 60, no. 5, p. 103816, 2023. [Online]. Available: https://doi.org/10.1016/j.im.2023.103816

[2]. Hashimzai IA, Mohammadi MQ. The Integration of Artificial Intelligence in Project Management: A Systematic Literature Review of Emerging Trends and Challenges. TIERS Information Technology Journal. 2024 Dec 25;5(2):153-64.

[3]. [M. M. Mariani, I. Machado, V. Magrelli, and Y. K. Dwivedi, "Artificial intelligence in innovation research: A systematic review, conceptual framework, and future research directions," Technovation, vol. 122, p. 102623, 2023. [Online]. Available: https://doi.org/10.1016/j.technovation.2022.102623

[4]. Sarwar H, Rahman M. A Systematic Short Review of Machine Learning and Artificial Intelligence Integration in Current Project Management Techniques. In2024 IEEE 4th International Conference on Software Engineering and Artificial Intelligence (SEAI) 2024 Jun 21 (pp. 262-270). IEEE.

[5]. E. Nascimento, A. Nguyen-Duc, I. Sundbø, and T. Conte, "Software engineering for artificial intelligence and machine learning software: A systematic literature review," arXiv preprint arXiv:2011.03751, 2020. [Online]. Available: https://arxiv.org/abs/2011.03751

[6]. Adamantiadou DS, Tsironis L. Leveraging artificial intelligence in project management: A systematic review of applications, challenges, and future directions. Computers. 2025 Feb 13;14(2):66.

[7]. W. H. Estler H.C, “Heuristic Search-Based Planning for Graph Transformation Systems,” ICAPS Workshop on Knowledge Engineering for Planning and Scheduling, p. 54, 2011.

[8]. M. Fahim, A. M. Salem, F. A. Torkey, and M. A. Ramadan, “Efficient enhanced k-means clustering algorithm,” Journal of Zhejiang University: Science, vol. 7, no. 10, pp. 1626–1633, 2006, doi: 10.1631/jzus.2006.A1626.

[9]. Salimimoghadam S, Ghanbaripour AN, Tumpa RJ, Kamel Rahimi A, Golmoradi M, Rashidian S, Skitmore M. The Rise of Artificial Intelligence in Project Management: A Systematic Literature Review of Current Opportunities, Enablers, and Barriers. Buildings. 2025 Mar 30;15(7):1130.

ISSN : 3067-8293
Volume 1, Number 2, 2025
https://doi.org/10.70445/ajac.1.2.2025.164-182

[10]. Fang C, Marle F (2012) A simulation-based risk network model for decision support in project risk management. Decis Support Syst 52(3):635–644. https://doi.org/10.1016/j.dss.2011.10.021

[11]. Faraji A, Rashidi M, Perera S, Samali B (2022) Applicability-compatibility analysis of PMBOK seventh edition from the perspective of the construction industry distinctive peculiarities. Buildings 12(2):210. https://doi.org/10.3390/buildings12020210

[12]. Kiani A. Artificial intelligence in entrepreneurial project management: a review, framework and research agenda. International Journal of Managing Projects in Business. 2024 Sep 24.

[13]. Fazli M, Fallah A, Khakbaz A (2020) risk management in construction projects considering the crossdependency project risks: utility maximization. Ind Manag Stud 18(56):337–374. https://doi.org/10.22054/jims.2019.25341.1875

[14]. Flasiński M (2016) Introduction to artifcial intelligence. Springer, Cham Fridgeirsson TV, Ingason HT, Jonasson HI, Jonsdottir H (2021) An authoritative study on the near future efect of artifcial intelligence on project management knowledge areas. Sustainability 13(4):2345. https://doi.org/10.3390/su13042345

[15]. Zhang Y, Xu S, Zhang L, Yang M. Big data and human resource management research: An integrative review and new directions for future research. Journal of Business Research. 2021 Sep 1; 133(2021):34-50.

[16]. Fridgeirsson TV, Ingason HT, Jonasson HI, Gunnarsdottir H (2023) A qualitative study on artifcial intelligence and its impact on the project schedule, cost and risk management knowledge areas as presented in PMBOK®. Appl Sci (Switzerland) 13(19):11081. https://doi.org/10.3390/app131911081

[17]. Friedrich K (2023) A systematic literature review concerning the diferent interpretations of the role of sustainability in project management. Manag Rev Q 73(1):31–60. https://doi.org/10.1007/s11301-02100230-z

[18]. Gejke C (2018) A new season in the risk landscape: Connecting the advancement in technology with changes in customer behaviour to enhance the way risk is measured and managed. J Risk Manag Financ Inst 11(2):148–155

[19]. Ghasemi F, Sari MHM, Yousef V, Falsaf R, Tamošaitienė J (2018) Project portfolio risk identifcation and analysis, considering project risk interactions and using Bayesian networks. Sustainability 10(5):1609. https://doi.org/10.3390/su10051609

[20]. Ghasemzadeh F, Archer NP (2000) Project portfolio selection through decision support. Decis Support Syst 29(1):73–88. https://doi.org/10.1016/S0167-9236(00)00065-8

ISSN : 3067-8293
Volume 1, Number 2, 2025
https://doi.org/10.70445/ajac.1.2.2025.164-182

[21]. Guan L, Abbasi A, Ryan MJ (2021) A simulation-based risk interdependency network model for project risk assessment. Decis Support Syst 148:113602. https://doi.org/10.1016/j.dss.2021.113602

[22]. Kerzner H. Project management: a systems approach to planning, scheduling, and controlling. John Wiley & Sons; 2025 Apr 8.

[23]. Hak F, Guimarães T, Santos M (2022) towards effective clinical decision support systems: a systematic review. PLoS ONE 17(8):e0272846. https://doi.org/10.1371/journal.pone.0272846

[24]. Haleem A, Javaid M, Qadri MA, Singh RP, Suman R (2022) Artifcial intelligence (AI) applications for marketing: a literature-based study. Int J Intell Netw. https://doi.org/10.1016/j.ijin.2022.08.005

[25]. Han SH, Kim DY, Kim H, Jang WS (2008) A web-based integrated system for international project risk management. Autom Constr 17(3):342–356. https://doi.org/10.1016/j.autcon.2007.05.012

[26]. Hu Y, Zhang X, Ngai EWT, Cai R, Liu M (2013b) Software project risk analysis using Bayesian networks with causality constraints. Decis Support Syst 56:439–449. https://doi.org/10.1016/j.dss. 2012.11.001

[27]. Kotb A, Hafeji Z, Jesry F, Lintern N, Pathak S, Smith AM, Lutchman KR, de Bruin DM, Hurks R, Heger M, Khaled YS. Intra-Operative Tumour Detection and Staging in Pancreatic Cancer Surgery: An Integrative Review of Current Standards and Future Directions. Cancers. 2024 Nov 12;16(22):3803.

[28]. Idrus A, Nuruddin MF, Rohman MA (2011) Development of project cost contingency estimation model using risk analysis and fuzzy expert system. Expert Syst Appl 38(3):1501–1508. https://doi.org/10. 1016/j.eswa.2010.07.061

[29]. Isaac S, Navon R (2014) Can project monitoring and control be fully automated? Constr Manag Econ 32(6):495–505. https://doi.org/10.1080/01446193.2013.795653

[30]. E. Faliagka et al., "On-line consistent ranking on e-recruitment: Seeking the truth behind a well-formed CV," Artificial Intelligence Review, vol. 42, no. 3, pp. 515–528, 2014, doi: 10.1007/s10462-013-9414-y.

[31]. M. Fazzolari, R. Alcala, Y. Nojima, H. Ishibuchi, and F. Herrera, "A review of the application of multiobjective evolutionary fuzzy systems: Current status and further directions," IEEE Transactions on Fuzzy Systems, vol. 21, no. 1, pp. 45–65, 2013, doi: 10.1109/TFUZZ.2012.2201338.

ISSN : 3067-8293
Volume 1, Number 2, 2025
https://doi.org/10.70445/ajac.1.2.2025.164-182

[32]. C. M. Fonseca and P. J. Fleming, "Genetic Algorithms for Multiobjective Optimization: Formulation, Discussion and Generalization," Icga, vol. 93, no. July, pp. 416–423, 1993, doi: citeulike-article-id: 2361311.

[33]. Gong, X., Wang, S., & Jiao, R. (2019). An efficient 2d genetic algorithm for optimal shift planning considering daily-wise shift formats: A case of airport ground staff scheduling. Paper presented at the 2019 IEEE International Conference on Industrial Engineering and Engineering Management (IEEM).

[34]. Isba, R., Woolf, K., & Hanneman, R. (2017). Social network analysis in medical education. Medical Education, 51(1), 81–88.

[35]. Ellington, L., Clayton, M. F., Reblin, M., Donaldson, G., & Latimer, S. (2018). Communication among cancer patients, caregivers, and hospice nurses: Content, process and change over time. Patient Education and Counseling, 101(3), 414–421. https://doi.org/10.1016/j.pec.2017.09.013

[36]. Ellington, L., Reblin, M., Clayton, M. F., Berry, P., & Mooney, K. (2012). Hospice nurse communication with patients with cancer and their family caregivers. Journal of Palliative Medicine, 15(3), 262–268. https://doi.org/10.1089/jpm.2011.0287

[37]. Ernesäter, A., Engström, M., Winblad, U., & Holmström, I. K. (2014). A comparison of calls subjected to a malpractice claim versus 'normal calls' within the Swedish healthcare direct: A case–control study. BMJ Open, 4(10), e005961. https://doi.org/10.1136/bmjop en-2014-005961

[38]. Ernesäter, A., Engström, M., Winblad, U., Rahmqvist, M., & Holmström, I. K. (2016). Telephone nurses' communication and response to callers' concern—A mixed methods study. Applied Nursing Research, 29, 116–121. https://doi.org/10.1016/j.apnr.2015.04.012

[39]. Fakhr-Movahedi, A., Salsali, M., Negharandeh, R., & Rahnavard, Z. (2011). A qualitative content analysis of nurse-patient communication in Iranian nursing. International Nursing Review, 58(2), 171–180. https://doi.org/10.1111/j.1466-7657.2010.00861.x

[40]. Finset, A., Heyn, L., & Ruland, C. (2013). Patterns in clinicians' responses to patient emotion in cancer care. Patient Education and Counseling, 93(1), 80–85. https://doi.org/10.1016/j.pec.2013.04.023

[41]. Fleischer, S., Berg, A., Zimmermann, M., Wuste, K., & Behrens, J. (2009). Nurse-patient interaction and communication: A systematic literature review. Journal of Public Health, 17(5), 339–353. https://doi.org/10.1007/s10389-008-0238-1

ISSN : 3067-8293
Volume 1, Number 2, 2025
https://doi.org/10.70445/ajac.1.2.2025.164-182

[42]. Ghosh, A. K., Joshi, S., & Ghosh, A. (2020). Effective patient-physician communication – A concise review. The Journal of the Association of Physicians of India, 68(6), 53–57. Gordon, C., Ellis-Hill, C., & Ashburn, A. (2009). The use of conversational analysis: Nurse-patient interaction in communication disability after stroke. Journal of Advanced Nursing, 65(3), 544–553. https://doi.org/10.1111/j.1365-2648.2008.04917.x

[43]. Hafskjold, L., Sundling, V., van Dulmen, S., & Eide, H. (2017). The use of supportive communication when responding to older people's emotional distress in home care – An observational study [journal article]. BMC Nursing, 16(1), 24. https://doi.org/10.1186/s12912-017-0220-8

[44]. Håkansson Eklund, J., Holmström, I. K., Kumlin, T., Kaminsky, E., Skoglund, K., Höglander, J., Sundler, A. J., Condén, E., & Summer Meranius, M. (2019). Same same or different? A review of reviews of person-centered and patient-centered care. Patient Education and Counseling, 102, 3–11. https://doi.org/10.1016/j.pec.2018.08.029

[45]. Hakimnia, R., Holmström, I. K., Carlsson, M., & Höglund, A. T. (2014). Exploring the communication between telenurse and caller–A critical discourse analysis. International Journal of Qualitative Studies on Health and Well-Being, 9(1), 24255. https://doi.org/10.3402/qhw.v9.24255

[46]. Heyn, L., Finset, A., & Ruland, C. M. (2013). Talking about feelings and worries in cancer consultations: The effects of an interactive tailored symptom assessment on source, explicitness, and timing of emotional cues and concerns. Cancer Nursing, 36(2), E20–E30. https://doi.org/10.1097/NCC.0b013e318254af66

[47]. Jacobucci, R., Grimm, K. J., & Mcardle, J. J. (2017). A comparison of methods for uncovering sample heterogeneity: Structural equation model trees and finite mixture models. Structural Equation Modeling: A Multidisciplinary Journal, 24(2), 270–282.

[48]. Jiang, K., & Messersmith, J. (in press). On the shoulders of giants: A meta-review of strategic human resource management. International Journal of Human Resource Management, 1-28.

[49]. Y. Hu, X. Zhang, E. W. T. Ngai, R. Cai, and M. Liu, “Software project risk analysis using Bayesian networks with causality constraints,” Decision Support Systems, vol. 56, no. 1, pp. 439–449, Dec. 2013, doi: 10.1016/j. dss.2012.11.001.

[50]. Li Y, Lu Y, Cui Q, Han Y. Organizational behavior in megaprojects: Integrative review and directions for future research. Journal of management in engineering. 2019 Jul 1;35(4):04019009.

ISSN : 3067-8293
Volume 1, Number 2, 2025
https://doi.org/10.70445/ajac.1.2.2025.164-182

[51]. S. V. Ioannou, A. T. Raouzaiou, V. A. Tzouvaras, T. P. Mailis, K. C. Karpouzis, and S. D. Kollias, “Emotion recognition through facial expression analysis based on a neurofuzzy network,” Neural Networks, vol. 18, no. 4, pp. 423–435, 2005, doi: 10.1016/j.neunet.2005.03.004.

[52]. Y. Pan and L. Zhang, "Roles of artificial intelligence in construction engineering and management: A critical review and future trends," Automation in Construction, vol. 122, p. 103517, 2021. [Online]. Available: https://doi.org/10.1016/j.autcon.2020.103517

[53]. R. S. Peres, X. Jia, J. Lee, K. Sun, A. W. Colombo, and J. Barata, "Industrial artificial intelligence in industry 4.0-systematic review, challenges and outlook," IEEE Access, vol. 8, pp. 220121-220139, 2020. [Online]. Available: https://doi.org/10.1109/ACCESS.2020.3042874

[54]. M. Regona, T. Yigitcanlar, B. Xia, and R. Y. M. Li, "Opportunities and adoption challenges of AI in the construction industry: A PRISMA review," Journal of Open Innovation: Technology, Market, and Complexity, vol. 8, no. 1, p. 45, 2022. [Online]. Available: https://doi.org/10.3390/joitmc8010045