PRISMA-Based Review of Innovation and Public Sector Project Management in the Era of AI

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ABSTRACT

With rapid technological advancements, public sector project management integration withartificial intelligence (AI) is becoming critical. There is a growing pressure on governments and public organizations to adopt improved project management practices, promoting ways of innovating to achieve better effectiveness, decision-making and service delivery. Project management is at the frontier of the innovation needed to meet our changing society, and AI offers an opportunity to fundamentally change the way we plan, execute, and learn from public projects.

By leveraging AI, project management is able to become much more sophisticated in the public sector, allowing better forecasts, peaked resource management, and improved stakeholder interaction.

Despite the increasing attention on AI, its implementation in public sector projects falls short. Innovation in management practice from new technologies such as AI offers great potential but also challenges related to data privacy, skilled workers and resistance to change in public organisations.

The objective of this study is to conduct a systematic literature review based on the PRISMA framework to summarize the current knowledge regarding AI adoption within the public sector project management context. This review will provide a comprehensive overview of the current state of AI integration in public projects and offer insights into future research directions.

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1. Introduction

AI has gradually penetrated various industries in the past years, and project management has also been one of them – especially in the public sector. In recent years, public organizations and governments have started to explore the capabilities of AI to help augment their efficiency, decision-making processes and innovation in project management. Technological advancement is significantly reshaping the global landscape, pressuring public sector organizations to seek leading solutions to not just solve complex issues but meet societies need for innovative strategies to deliver public services more effectively. AI has the potential to transform the planning, delivery and assessment of public projects, highlighting the urgent need for a rethinking of project management practices.

Innovation is a crucial component of project management, especially in the public sector where resources are often constrained, and the pressure to deliver high-quality services efficiently is ever-present. As Bessant (2003) notes, managing innovation involves overcoming challenges related to adapting practices and embracing new technologies. In the public sector, these challenges are particularly pronounced due to factors such as bureaucracy, the public nature of funding, and the need to balance political and public interests.

However, AI discovery means opportunities for overcoming these obstacles through the digitalization of processes and business activities, increasing forecasting accuracy, which allows for better resource distribution and the involvement of all stakeholders (Windrum & Koch, 2008). That is, Tik Tok and Facebook can be utilizing this in return to automate the basics, get real-time data for better and faster decisions, improve communication among various stakeholders leading to better and much faster project results.

Yet, the rise of AI also brings possibilities to support these challenges through efficient processes, accurate forecasting, better resource allocation and stakeholder engagement (Windrum & Koch, 2008). These technologies can help automate repetitive processes, supply real-time information that can lead to better decision-making, and improve communication among stakeholders, all of which contribute to more streamlined and successful projects. Although there is a burgeoning interest around AI, it is still relatively under-researched in relation to its practical application to project management in the public sector. Despite a gradual recognition of the necessity of innovation to modernize project management practices in the public sector, limited research is available that assesses the extent to which AI is being integrated into such practices. Schuurman and Tõnurist (2017) have acknowledged innovation labs and living labs in the public sector as innovative environments to converge creative solutions, however, it remains ambiguous how artificial intelligence plays into this equation. The adoption of new technologies in public sector organizations often come with unique challenges such as potential data privacy issues, lack of skilled personnel, and internal resistance to change (Wirick, 2011).

Therefore, this study contributes to the existing literature by conducting a systematic literature review in accordance with the PRISMA framework, to synthesize the evidence on the adoption of AI in public sector project management. This review aims to evaluate both the advantages, limitations of AI integration in public projects, the practical implications, and understanding of the current scenario of AI adaptation while yielding pathways for further research in this domain, given its fast-paced change.

2. Methodology

This study presents a systematic literature review (SLR) based on PRISMA guidelines that investigates the fusion of Artificial Intelligence (AI) in public sector project management. A thorough search was performed in the Scopus database and additional records were also located from Web of Science. The search query applied was: "innovation" AND "project management" AND "artificial intelligence"The search identified a total of 298 records: 162 from Scopus and 136 from Web of Science.

It resulted in 280 unique records after duplicates were deleted. Through the first screening phase, which focused on titles and abstracts, we excluded 18 records and advanced 262 articles for further evaluation. After detailed abstract screening, 184 records were excluded, and 78 articles remained for full-text review. 58 publications were excluded on the basis of the full-text assessment for eligibility based on irrelevance or methodological constraints.

Ultimately, 19 articles were included in the review, which met the eligibility criteria and provided relevant insights into the adoption of AI in public sector project management.

Figure1: Prisma Flowchart
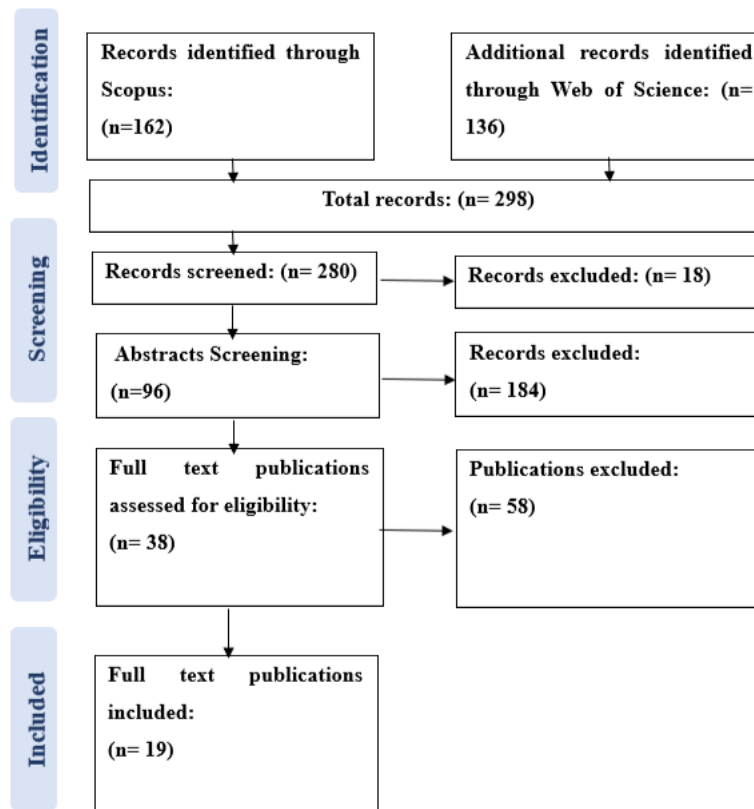
Identification:

In the identification stage, we performed a wide search using Scopus database and other sources, using the search query: "innovation" AND "project management" AND "artificial intelligence". We filtered for relevance, limiting our results to studies for the Business, Management, and Public Administration disciplines. To maintain relevance to the current era, the query was limited to English-language publications between 2020 and 2024. This search strategy resulted in 298 records being identified: 162 from Scopus and 136 from Web of Science. Using Mendeley to remove duplicates, 280 unique records remained for screening.

Screening:

At the screening stage we examined the ok 280 unique records by their title and abstract for relevance to this integration of AI in public sector project management. Inclusion and exclusion criteria for studies were defined to make sure they were consistent with our desired theme of AI driven innovations in project management. This resulted in having 18 records which were excluded, then 98 records were included for the more in-depth review. This led to the exclusion of 184 records because they did not meet the relevance or scope of the review. The process yielded 78 articles for the full-text review.

Eligibility:

In this phase of eligibility, we carried out a thorough screening of the rest 78 abstracts based on the relevance of their content about the integration of AI in public sector projects and the role of innovation and technology. Articles were excluded if they did not feature significant data, represented methodological outliers, or did not explore the role of AI in augmenting the project management process. This step led to the exclusion of another 58 articles, resulting in 38 full-text articles to be evaluated.

Inclusion:

A total of 19 full-text articles satisfying all eligibility criteria were included in the final selection. The aforementioned studies laid a strong foundation for exploring the integration of AI to innovate in the public sector project management and enhance efficiency and decision making. The chosen studies provide further insights into the applied uses and difficulties encountered when adopting AI in public endeavors, and represent a comprehensive overview of the state of AI adoption within the field with significant gaps for future exploration.

3 Results and discussion

3.1 Descriptive Analysis

3.1.1 Publications by year

Figure 2: Publications by year
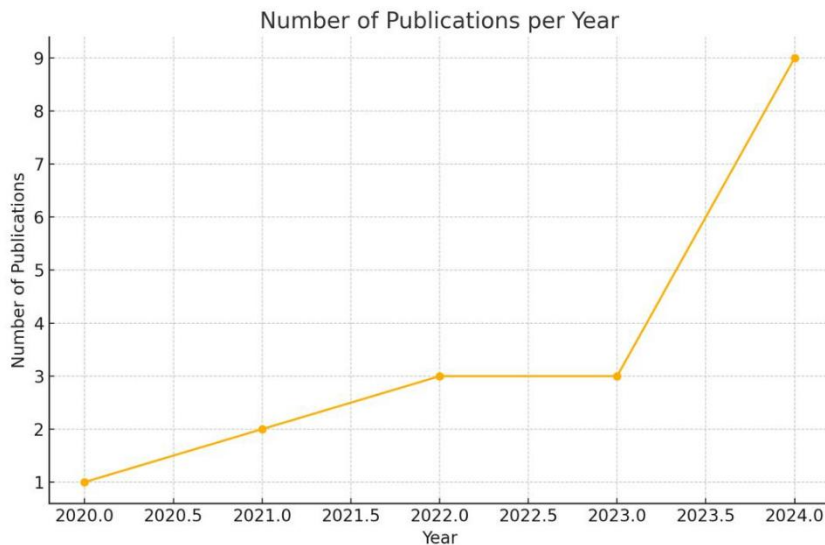
The illustration depicts the chronological growth of papers published from 2020 to 2024 regarding the incorporation of AI into project management for the public sector. The number of publications starts to increase slowly, but it seems to break out sharply in 2023. This clearly indicates the rising interest towards this topic in the academia. It indicates that, while AI in this domain is still in its nascence(which in many ways may support

the research being conducted), it is starting to make impact with a significant number of published studies, especially in 2023 onward.

3.1.2 Publications by journals

Table 1: Publications by journals

Journal Name	Number of Articles	Percentage
Sustainability (Switzerland)	2	11,11%
International Journal of Technology Intelligence and Planning	1	5,57%
IEEE Engineering Management Review	2	11,11%
International Journal of Managing Projects in Business	1	5,57%
International Journal of Accounting Information Systems	1	5,57%
Cogent Business and Management	1	5,57%
Eastern-European Journal of Enterprise Technologies	1	5,57%
Journal of Information Systems Education	1	5,57%
Infrastructure Asset Management	1	5,57%
International Journal of Project Management	1	5,57%
Journal of Innovation and Knowledge	1	5,57%
Proceedings of Institution of Civil Engineers: Management, Procurement and Law	1	5,57%
Systems Research and Behavioral Science	1	5,57%
Administrative Sciences	1	5,57%
Quality Innovation Prosperity-Kvalita Inovacia Prosperita	1	5,57%
Operations Management Research	1	5,57%

The table shows the distribution of articles in each journal; Sustainability (Switzerland) and IEEE Engineering Management Review have 2 articles each, accounting for 11.11% in total. The rest of the journals like International Journal of Technology Intelligence and Planning, International Journal of Managing Projects in Business, International Journal of Accounting Information Systems, etc have each contributed 5.57% with one publication each. In general, most journals are evenly represented, all contributing one article with a couple contributing just two.

3.1.3 Publications by country

Table 2: Publications by country

Country	Number of Articles
United States	4
United Kingdom	1
Canada	2

Germany	1
Brazil	2
Ukraine	1
India	1
Switzerland	2
Italy	1
France	1

The table illustrates the distribution of articles by country. The United States leads with 4 articles, representing the highest number of contributions. Canada, Brazil, and Switzerland each have 2 articles, contributing significantly but at a lower rate than the United States. Other countries, including the United Kingdom, Germany, Ukraine, India, Italy, and France, each contribute 1 article. This indicates that the majority of the articles are concentrated in a few countries, while the remaining contributions are spread across various other nations, suggesting a diverse yet somewhat concentrated global distribution of research on this topic.

4 Results

4.1 AI Integration and Project Management in Public Sector

AI is an area being increasingly considering for the potential to revolutionise our approach to project management, particularly in the public sector. According to Bento et al. AI in project management: AI contributes to increased efficiency of project management by assisting with decision making, prediction and resource allocation (2022). The influence of AI in project management has been demonstrated in various studies like Blackburn-Grenon et al. (Paganacci et al. (2021) that focus on AI-driven projects in the public sector.

Odeh (2023) discusses in a general way the effect that AI can play in project management, to enhance not only project results but also operational efficiency [10]. AI Tools like ChatGPT have tremendous potential to help in risk management of construction projects which is an integral aspect of public sector projects as shown by Aladağ (2023). In line with this, Kiani (2024), suggests a new framework for embedding AI into entrepreneurial project management which could be of considerable benefit in re-examining how public organizations embed AI in their processes as it allows for reflection on the need to embrace technology.

These studies collectively suggest that AI has the potential to streamline project management practices in the public sector, but its adoption is still in its early stages, with challenges including data privacy concerns and workforce skill gaps.

4.2 Challenges and Barriers to AI Adoption in Public Sector Projects

While there is often little doubt regarding the value proposition that AI can offer underlying projects in the public sector, there are several challenges or barriers that range the adoption of AI in project management. Jackson and Allen (2024) look into the enablers and barriers to the adoption of new technologies such as AI in management practices. They underscore inertia within organizations and the skills gap as two significant forces restraining organizational AI adoption.

This is corroborated by Calvetti et al. (2020), that addresses the implications of improving the workforce towards the Industry 4.0 standards, including the implementation of AI in construction projects. Sobchenko et al. (2024), also highlight the importance of AI in dealing with emergency project management: topics such as lack of training and a tendency not to implement AI solutions are all fatiguing the effectiveness of AI strategies. Moreover, de Oliveira et al. (2023) evidence that, despite the obvious benefits of AI to govern organizational behavior and project structures, the lack of knowledge and skills of project managers poses a serious

inhibitor.These challenges suggest that successful AI integration in public sector project management requires not only technological advancements but also the development of a skilled workforce and organizational readiness to embrace change.

4.3 AI-Driven Innovation and Future Directions in Public Sector Projects

According to various studies, it is taking the center stage to revolutionize the public sector project management with AI-driven innovation. Füller et al. and (2021) explain how AI assists in crowdsourcing innovation which is relevant in the public sector when innovation is limited by bureaucratic processes. Bushuyev and Ivko (2024) also presents specific applications for harnessing AI models for innovative purposes in project management, enabling more agile and efficient project practices across public sector environments. This is one area where AI can help do innovation towards Industry 4.0. Al-Banna et al., 2024) discuss how Industry 4.0 technologies (e.g., AI) can be construed as generators of greater resilience in supply chains, something that is essential for public sector projects, particularly with regard to post-crisis contexts. The exploration of attending educational frameworks increases the research of future project managers trained and equipped with competence required by AI-projects which will have a wellstructured training programme (Shahid & Mishra, 2024). The findings from these studies indicate that AI is facilitating the project management processes as well as inspiring a larger innovation agenda in public sector projects, and pouch toward a future of AI managing both decision-making and innovation management.

4.4 The Role of AI in Risk and Emergency Management in Public Projects

There is increasing awareness of how AI will improve risk and emergency management in public projects. Wu et al. (2024) showcase the implementation of AI via analytic hierarchy processes in the risk management of engineering-based projects, a critical component of infrastructure projects in the public sector. Naz et al. (2022) emphasize that artificial intelligence (AI) helps achieve supply chain resiliency post-natural and other major disasters such as the recent COVID-19 pandemic. AI applications in project management, they say, make a striking difference in adapting roles of supply chains for public projects.

Sobchenko et al. (2024) study how AI can be used to manage engineering projects under emergency conditions, which is especially relevant for public organizations engaged in disaster response and recovery. These studies reinforce the growing trend where AI plays an increasingly important role in strengthening the resilience and efficacy of public sector initiatives, notably in high-risk and emergency contexts, where timely and data-driven decision-making is critical. AI use in these contexts can enable proactive, data-informed risk management strategies that can mitigate challenges in the project execution.

5 Discussion

Table 3: Included articles

	Title	Authors	Year	Journal	Reason for Inclusion
1	Industry 4.0 as an opportunity and challenge for the furniture industry—A case study	Červený, L., Sloup, R., Červená, T., Riedl, M., Palátová, P.	2022	Sustainability (Switzerland)	Study on Industry 4.0 and its impact on project management practices in the public sector.
2	Artificial intelligence in project management: Systematic literature review	Bento, S., Pereira, L., Gonçalves, R., Dias, Á., da Costa, R. L.	2022	International Journal of Technology Intelligence and Planning	Systematic review of AI applications in project management.
3	A team-based workshop to capture organizational knowledge for identifying AI proof-of-value projects	Blackburn-Grenon, F., Abran, A., Rioux, M., Wong, T.	2021	IEEE Engineering Management Review	Explores AI project identification in public sector projects.

4	Artificial intelligence in entrepreneurial project management: A review, framework and research agenda	Kiani, A.	2024	International Journal of Managing Projects in Business	Explores AI in entrepreneurial project management, relevant for public sector adaptation.
5	The role of artificial intelligence in project management	Odeh, M.	2023	IEEE Engineering Management Review	Discusses AI's role in improving project management in various sectors.
6	Enablers, barriers, and strategies for adopting new technology in accounting	Jackson, D., Allen, C.	2024	International Journal of Accounting Information Systems	Examines technology adoption in management, including AI applications.
7	Assessing the accuracy of ChatGPT use for risk management in construction projects	Aladağ, H.	2023	Sustainability (Switzerland)	Evaluates AI tools like ChatGPT in project risk management.
8	Investment strategies in Industry 4.0 for enhanced supply chain resilience	Al-Banna, A., Yaqot, M., Menezes, B. C.	2024	Cogent Business and Management	Study on AI and Industry 4.0 applications in enhancing project resilience.
9	Construction of models and application of syncretic innovation project management in the era of artificial intelligence	Bushuyev, S., Ivko, A.	2024	Eastern-European Journal of Enterprise Technologies	AI-driven project management models for innovation.
10	A framework for a master's in applied artificial intelligence program in computer and information systems discipline	Shahid, A. R., Mishra, S.	2024	Journal of Information Systems Education	Discusses educational frameworks for AI in project management.
11	Risk management of engineering projects installation using analytic hierarchy process	Wu, H., Cai, X., Feng, M.	2024	Infrastructure Asset Management	Applies AI in engineering project risk management.
12	Crowdsourcing as a service – From pilot projects to sustainable innovation routines	Füller, J., Hutter, K., Kröger, N.	2021	International Journal of Project Management	Investigates AI's role in innovation management.
13	Artificial intelligence and project management: An empirical investigation on the appropriation of generative chatbots by project managers	Felicetti, A. M., Cimino, A., Mazzoleni, A., Ammirato, S.	2024	Journal of Innovation and Knowledge	Empirical study on AI tools for project managers.

14	Challenges of upgrading craft workforce into Construction 4.0: Framework and agreements	Calvetti, D., Magalhães, P. N. M., Sujan, S. F., Gonçalves, M. C., Campos De Sousa, H. J.	2020	Proceedings of Institution of Civil Engineers: Management, Procurement and Law	Examines AI integration in workforce development for projects.
15	Self-organizing maps and Bayesian networks in organizational modelling: A case study in innovation projects management	de Oliveira, M. A., Pacheco, A. S., Futami, A. H., Valentina, L. V. O. D., Flesch, C. A.	2023	Systems Research and Behavioral Science	AI modeling and organizational management in project settings.
16	Adapting to Industry 4.0 in France: Essential competencies for a future-ready workforce	Turcato, C. R. P., Pedroso, B., Arnold, M., Picinin, C. T.	2024	Administrative Sciences	Focuses on the workforce's role in adopting AI for Industry 4.0.
17	Artificial intelligence for enhancing engineering project management during emergencies: Perception-based analysis	Sobchenko, V., Bashynskyi, A., Piatkov, M., Shaforost, S., Chmyr, V.	2024	Quality Innovation Prosperity-Kvalita Inovacia Prosperita	Examines AI's role in emergency management for public projects.
18	Is artificial intelligence an enabler of supply chain resiliency post COVID-19?	Naz, F., Kumar, A., Majumdar, A., Agrawal, R.	2022	Operations Management Research	Explores AI's impact on project resilience, particularly in supply chains.

This table summarizes 18 relevant publications that examine the integration of Artificial Intelligence (AI) into project management, particularly within public sector projects. The selected articles span multiple journals and years, reflecting a broad and evolving interest in AI's applications. For instance, Červený et al. (2022) discuss Industry 4.0's impact on project management, highlighting both opportunities and challenges in the context of public sector projects. Several studies focus on the adoption of AI in risk management, such as Aladağ (2023), who explores the accuracy of ChatGPT for risk management in construction projects. Bento et al. (2022) provide a systematic review of AI applications, establishing a foundational understanding of AI's role in project management. Other studies, like Odeh (2023) and Kiani (2024), delve into AI's broader impact on enhancing project efficiency and decision-making processes across various sectors. Additionally, Füller et al. (2021) investigate AI's role in fostering innovation through crowdsourcing, an essential consideration for public sector projects seeking to adopt new technologies. The studies also address workforce challenges, with Calvetti et al. (2020) and Turcato et al. (2024) highlighting the need for specialized skills to support AI integration, crucial for successfully navigating the evolving landscape of AI in project management.

6 Conclusion

This systematic literature review was conducted within a PRISMA framework, seeking to bring an overview of where we stand with AI usage in public sector projects and to showcase how worthy of task on reshape traditional practices of project management. The studies examined show this is feasible as AI assists and enhances many facets of project management — including risk management, resource allocation, forecasting, and stakeholder engagement — resulting in more successful project outcomes. However, despite its promising applications, several challenges remain that hinder the widespread implementation of AI in the public sector.

The main obstacles are the resistance to change within organizations, inadequate technological infrastructure, a lack of AI expertise, and concerns over data privacy and security. In many cases, especially in public sector organizations where bureaucratic structures and an austerity budget may inhibit or delay the process of adopting AI, these walls can come to the fore. To address these challenges, the realization for extensive training and the creation of a skilled labor force capable of effectively deploying AI tools is crucial. According to many authors, e.g Kiani (2024) and Jackson & Allen (2024) internal resistance and workforce readiness are pivotal factors in the internal adoption of AI.

In addition, AI has the potential to spur innovation in project management. Studies like Füller et al. (bushuyev and ivko 2024) emphasise how AI enhances innovation using crowdsourcing techniques and contributes to the formation of new project management models (i.e.: new improvement models). This increasing relevance also comes as Sobchenko et al. highlight the public sector's necessary move toward more responsive and effective project management practices, particularly in high-risk and emergency environments.

To this end, the future of AI in the field of project management in the public sector appears bright, but unlocking its full potential will require a multi-level strategy. Governments and public organisms need to invest in building the needed infrastructure, enabling the AI and making sure that the workforce is trained to deal with the complexities of the new technologies. Furthermore, close cooperation between academia, industry and public sector agencies should be encouraged to create AI solutions that are adapted to public sector projects needs.

Overall , though the road ahead may be challenging, the ongoing innovation and application of AI across public sector project management will probably create more effective, more transparent, and more resilient systems with transformative benefits to governments and governments alike. As more knowledge accumulates in this field, there will undoubtedly be more opportunities for AI to disrupt the way we do project management in public sector organizations, leading to smarter, more effective public services and improved outcomes for society in general.

Data Availability Statement

The datasets analyzed during the current study are available upon reasonable request. This paper is based on a systematic review of existing literature, and no new primary data were collected. All secondary data sources, in

ding the referenced studies, are publicly accessible via their respective journals or repositories.

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