sciendo

AI in Project Management: Technical Prerequisites, Digital Knowledge, and Organizational Maturity

Florina PÎNZARU
The National University of Political Studies and Public Administration, Bucharest, Romania
florina.pinzaru@facultateademanagement.ro

Alexandra ZBUCHEA
The National University of Political Studies and Public Administration, Bucharest, Romania
alexandra.zbuchea@facultateademanagement.ro

Mădălina-Elena STRATONE*
The National University of Political Studies and Public Administration, Bucharest, Romania
**Corresponding author, madalina.stratone@facultateademanagement.ro*

Abstract. *The integration of Artificial Intelligence (AI) in project management is reshaping managerial roles, organizational maturity, and required technical competencies. This study examines the relationships between key constructs influencing AI adoption in project management: Technical Prerequisites (TP), Digital Knowledge of the Project Manager (DGK), Changes in the Project Manager's Job due to AI-driven Digital Transformation (CDT), and AI-driven Digital Maturity of the Organization (AIM). The data collected from 186 project management professionals across eight countries (Romania, Belgium, Austria, Germany, the Netherlands, Italy, the United Kingdom, and France) and was analyzed using Structural Equation Modeling (SEM) with SmartPLS 4.0. The results of the research demonstrate how important technical preparedness and digital expertise are to facilitating AI-driven changes in project-based settings. Furthermore, this paper offers a framework for businesses looking to improve digital maturity through project management techniques, as well as theoretical and practical insights into the changing capabilities needed for AI adoption.*

Keywords: AI, project management, technical prerequisites, digital knowledge, organizational maturity.

Introduction

Project management is one of the industries that is changing rapidly due to the quick development of Artificial Intelligence (AI) technology and due to this, AI-driven solutions are being incorporated into project management procedures more and more as businesses look to improve productivity, agility, and decision-making (Rane, 2023). Artificial Intelligence (AI) applications including natural language processing, machine learning, predictive analytics, and automated project tracking have the power to completely change the way that projects are organized, carried out, and tracked (Shaik et al., 2022). However, the technical requirements for adoption, the level of digital expertise of project managers, the degree to which AI impacts project management roles, and the overall AI-driven digital maturity of organizations are all important factors that determine whether AI can be successfully implemented in project management.

The topic of artificial intelligence (AI) and project management is still developing, with researchers and business professionals working to comprehend how AI may enhance decision-making, maximize resources, and increase project success rates. Although artificial intelligence (AI) presents huge opportunities for efficiency and automation, it also brings difficulties with in

DOI: 10.2478/picbe-2025-0318

terms of organizational readiness, necessary digital skills, and changes in the roles of project managers (Sahadevan, 2023). This paper aims to look into these issues by examining the connections among the following important constructs that impact the adoption of AI in project management: technical requirements, the project manager's digital expertise, changes in the project manager's role brought about by AI-driven digital transformation, and the organization's AI-driven digital maturity.

The growing complexity of contemporary projects, which require increased agility and effectiveness, highlights the practical use of AI in project management. While AI-driven solutions facilitate data-driven decision-making, risk assessment and resource optimization, traditional project management techniques frequently rely on human expertise and intuition (Alshaikhi & Khayyat, 2021; Nenni et al., 2024). By enhancing project outcomes and minimizing operational inefficiencies, organizations that successfully incorporate AI into project management workflows can obtain a competitive advantage (Kordon, 2020). Even though AI applications are becoming more and more popular, empirical studies that look at how organizational, managerial, and technical aspects interact to promote AI adoption are limited. Thus, this paper contributes to the existing literature by using structural equation modeling to analyze how these factors interact and influence each other.

In order to address the current research gap, the following research question was formulated: What impact do technical prerequisites, digital knowledge, changes in project managers' roles, and organizational AI maturity have on the effective integration of AI in project management? Based on question, the following hypothesis were formulated: (H1) indicates that technical prerequisites have a positive influence on the the already mentioned research digital knowledge of the project manager. (H2) supported that technical prerequisite have a positive influence on the changes in the project manager's job due to the AI-driven digital transformation. (H3) assumed that digital knowledge of the project manager has a positive influence on the AI-driven digital maturity of the organization. Hypothesis (H4) points out that changes in the project manager's job due to the AI-driven digital transformation have a positive influence on the AI-driven digital maturity of the organization.

To test these hypotheses, this study employs structural equation modeling, a statistical technique that allows researchers to examine complex relationships between latent constructs. In management research, structural equation modeling is especially useful since it allows for the evaluation of several interconnected relationships while taking measurement errors into consideration. The data was analyzed using the SmartPLS 4.0 software because of its capacity to manage intricate models with latent variables. In order to ensure a representative and diverse sample, the study gathered data from 186 respondents (including project management professionals from a range of industries) from eight European countries: Romania, Belgium, Austria, Germany, the Netherlands, Italy, the United Kingdom, and France.

Furthermore, this paper is structured as follows: The literature review on AI in project management that follows brings into discussion basic ideas and earlier research that is relevant to the study's constructs; the research methodology is then explained, including data collection, measurement tools, and the use of structural equation modeling; then, the results are presented in the findings section, which also includes statistical analyses and the results of hypothesis testing; the discussion section interprets the findings, examining their implications for academia and industry and providing suggestions for organizations looking to improve AI adoption in project management. Lastly, the conclusion underlines important findings, recognizes its limitations, and identifies areas for further research.

Literature review

AI-driven digitalization of project management

The digitalization of project management is not new, as the job boom in the 2000s was accompanied by the rise of powerful dedicated software programs, such as Primavera and Microsoft Project, to name only the most used ones. PM processes are undergoing a major transition towards digitalization, which calls for a constant reevaluation of current approaches and technologies as they emerge, for instance, the remote digitalized project management (Katari et al., 2021), or the necessity to develop data-savvy talent (Liu et al., 2024).

Artificial intelligence stands out as an important driver of efficiency and innovation in project management when it comes to the technological advances that are influencing this digitalization. AI is often cited in academic literature and by consultancy companies' reports and insights as a source of significant enhancements in project success rates, facilitated by improved decision-making processes and data analytic capabilities (Zia et al., 2024). These signals on the successful revolution of AI adoption in PM vary from anticipatory essays (Niederman, 2021) to data gathered through surveys and qualitative research. Considering the multiple signs that AI is playing an increasingly important role in project management, integration and automation, alongside the application of chatbots, have emerged as the first practical advances in this ongoing change.

Integration and automation represent the early adoption of AI in PM, along with the adoption of chatbots. In this respect we can consider project budget updates within a database being directly integrated into the budget forecast report without any manual intervention or chatbot assistants that organize meetings, create plan vs progress checks, remind project team members of scheduled activities, or include initial insights into the existing data (Lahmann, 2017). Assistant chatbots are particularly well-suited for managing routine inquiries, which enables project managers to concentrate on the strategic aspects of their work, such as stakeholders' engagement (Joshi, 2024). Chatbots can be successfully used beyond routine tasks - given the emerging possibilities of generative technologies – when they are matched with a specific type of human interaction. For instance, generative AI appropriation, understood as the adaptation of generative AI chatbots for efficient and effective customized use, is considered to be more meaningful when applied by project managers that have a high level of creative behavior: such approach enhances project efficiency, effectiveness, and innovation, as proved by an exploratory quantitative study led on project managers from Italy (Felicetti et al., 2024).

With the rise of machine learning technologies (MLTs), a new phase of AI impact in PM is expected. MLTs aim "to optimize the performance of a system in handling new instances of data through defining programming logics for a given environment, (…) drawing heavily on statistics and computer science" (Basha & Rajput, 2019). MLTs are already used for a variety of tasks in PM, like forecasting the anticipated net promoter score (NPS), predicted client satisfaction, and projected write-offs for internal projects (Lahmann, 2017). Using the method of Monte Carlo simulation and including a SHAP-value-based explainability layer, Santos et al. (2023) demonstrate the significance of MLTs in quantifying the impact of various project activities and decisions on overall project outcomes, specifically time and cost. The importance of using MLT to improve project outcomes is expected to go much further in the future: Lahmann (2017) speaks about predictive project analytics as the most disruptive innovation of PM until 2027, allowing project managers to draw solid conclusions regarding circumstances and forthcoming situations, allowing decision-makers to recognize prospective hazards and opportunities prior to their manifestation.

Despite the positive outcome of AI in PM mentioned previously, there are authors who highlight that the overall low success rate of projects of 36% (PMI, 2024a) seems to be the insufficient maturity of technologies available for project management (Nenni et al., 2024). AI is expected to significantly transform until 2030 the field of project management when it will be used for more than the current data collection applied mostly to advise, prediction, and classification (ibid.). The aspects of project management most likely to be disrupted in the near future are as follows: (1) the selection and prioritization of projects by choosing more efficiently the projects with higher chances of success and more needed in the organization's portfolio; (2) support for the project management office, by better monitoring and automation of repetitive tasks through virtual assistants; (3) improved planning and reporting of projects by automation; (4) possibility to replace an important part of the work of the project assistant with AI; (5) advanced solutions for testing solutions developed in projects, with early detection of defects and self-correcting processes; (6) a possible new role for the project manager that will pass from the administrative work to more leadership and business acumen (Nieto-Rodriguez & Vargas, 2023).

The moment of such transformation of projects seems to be quite soon, as 2030 is the discussed milestone in literature (Bierwolf et al., 2017; Walker & Lloyd-Walker, 2019): the technology is, in many cases, already available – for example, early tests on ChatGPT proved, since 2023, AI's capacity to provide reasonable support to the project managers on methodological aspects (Minelle & Stolfi, 2025). Nevertheless, the adoption of AI for project management depends on budgets and on the actual outputs it will produce, and that depends on training reliant on vast amounts of data on projects (ibid.). The quality of outputs will also depend on how skilled the employees are in integrating AI into project management, as it is expected to change entirely the way that teams work on projects.

The complex relationship digital knowledge, organizational AI maturity and the ways of working of project managers

Technical prerequisites matter whenever we discuss the adoption of new technology – especially more in the case when the technology is disruptive. Even if the skills and knowledge regarding the technology are not developed initially, if the technology is perceived to be easy to use and useful, there are bigger chances that individuals will accept it, as the TAM (technology acceptance) model shows (Davis, 1989). The initial TAM model proved that what matters is how easy the technology is to use. Based on that, the usefulness and the adoption are developed: ease of use > usefulness > usage chain of causality. AI is straightforward to use in most cases compared to previous computer software; in many cases, no special technical training is compulsory to use it: for example, the usage is intuitive, based on simple interrogations or prompts in the case of large language models (LLMs). AI is expected to empower nontechnical people (Wilson & Daugherty, 2018), democratizing the use of software for various new forms of work.

The propensity to digital technology is a complex construct, being developed based on different factors: individual factors, such as openness to change (Ngereja & Hussein, 2022), interest in innovation (Juma, 2016), tech confidence (Whyte & Whyte, 2015); fear of missing out or FOMO (Yang et al., 2025), digital literacy (DiGiuseppe et al., 2017), and experience with digital instruments (Ratchford & Barnhart, 2012); social and cultural factors, such as peer influence (Zingora, Stark & Flache, 2020), social norms (Sawang, Sun & Salim, 2014), and workplace environment (Maruping & Magni, 2015); economic and environmental factors, such as availability and affordability of resources (Hall & Khan, 2003) and of infrastructure (Saxena, 2017); technological factors, such as user-friendliness (Agarwal & Prasad, 1998), reliability of technology

(Khan & Khan, 2024), customization (Tsou, 2022), and integration and interoperability of tech instruments (Li, Yigitcanlar, Erol, & Liu, 2021); (4) governmental factors, such as government support and policies (Wang, Li, Li, & Ye, 2023) or digital inclusion initiatives (Alamelu, 2013).
The elements influencing individuals' inclination to embrace digital technology underline the significance of personal, social, psychological, and environmental components while emphasizing the need for particular approaches when preparing specific groups for technological integration. Project managers are such a group: they often act as a bridge between organizational strategy and execution (Ul Musawir, Abd-Karim & Mohd-Danuri, 2020); thus, they are required to have a nuanced understanding of technological systems and the ability to leverage specific tools to optimize processes – at present, AI-based ones. Therefore, the focus shifts from generalized adoption factors to targeted aspects such as technical prerequisites, digital knowledge, and AI readiness.

Project managers ' technical prerequisites are important when assessing their ways of working. To successfully work, project managers must have robust abilities in identifying the technical components of projects (Thamhain, 1991). Combined with at least a reasonable level of digital knowledge, these abilities can allow them to assess and construct the essential infrastructure required for AI deployment if needed, even if project managers work with AI at different speeds and degrees of sophistication. For example, the most advanced project managers in terms of adopting AI use it for complex applications like risk management, data analysis, and budgeting (PMI, 2024b). Such project managers are often proficient not only in technical aspects of the projects in advances of digital technologies (in our case, AI) but also have a deep understanding of the organization's approach to disruption outside specific projects, which enables them to foresee prospective issues and synchronize technical needs with overarching organizational initiatives. Technological prerequisites and are a good basis for an orientation toward digital instruments and acquiring digital knowledge when project managers possess a solid understanding of technical infrastructure, including digital (Shenhar, 1993; AlAli, 2022), creating a positive foundation for practical AI usage at work for better collaboration (Zadeh, Khoulenjani & Safaei, 2024), analytics (PMI, 2024b), and advances in the job correlated to personal AI readiness (Szczepańska-Woszczyna & Gatnar, 2022).

Therefore, in alignment with these arguments, the authors propose the following hypothesis:

H1. Technical prerequisites have a positive influence on the digital knowledge of the project manager.

H2. Technical prerequisite have a positive influence on the changes in the project manager's job due to the AI-driven digital transformation.

H3. Digital knowledge of the project manager has a positive influence on the AI-driven digital maturity of the organization.

H4. Changes in the project manager's job due to the AI-driven digital transformation have a positive influence on the AI-driven digital maturity of the organization.

Methodology

Nowadays, in order to effectively manage complicated projects and increase performance in the digital age, project managers need to adapt by developing their soft skills and digital knowledge (Marhraoui, 2022). The data collection for this study was conducted between January 2024 and February 2024 through an online survey targeting line managers and senior experts. The sample used was one of convenience, chosen to align with the study's objective of exploring the challenges

and opportunities faced by project managers in the context of the emergence of artificial intelligence. This methodological approach was deemed appropriate for capturing diverse perspectives across different European regions, providing valuable insights into the evolving landscape of project management amid digital transformation.

A total of 186 respondents from eight countries—Romania, Belgium, Austria, Germany, the Netherlands, Italy, the United Kingdom, and France—completed the questionnaire. The questionnaire was distributed to managers through email, discussion groups, and various social media networks to reach as many participants as possible. Table 1 points out the socio-demographic characteristics of the respondents, including their gender, age, work experience, experience in Project Management, coverage of the organization (national and international) and the size of the organization they are part of.

Table 1. Socio-demographic characteristics of the respondents

Demographics (N=186)		Frequency	Relative Frequency %
Gender	Male	69	37.3%
	Female	115	62.2%
	Prefer not to say	1	0.5%
Age	18-25	14	7.6%
	26-35	56	30.3%
	36-45	70	37.8%
	46-55	30	16.2%
	Over 55	15	8.1%
Work experience	Senior expert with experience in project management	64	34.4%
	Project Manager	63	33.9%
	Line manager	13	7%
	Middle manager	26	14%
	Top manager	20	10.8%
Experience in Project Management	Less than 1 year	13	7%
	1-3 years	41	22.2%
	3-5 years	30	16.2%

Source: Authors` own research results.

Results and discussions

Structured equation modeling (SEM) was used to analyze the theoretical model with associated hypotheses, as shown in Figure 1, using SmartPLS 4.0 (SmartPLS, n.d.). This data analysis method was selected because it can effectively explore the complex relationships between latent constructs—which are measured using a variety of observed variables or items (Sarstedt & Cheah, 2019). The constructs of the model (as pointed out in Figure 1) are: TP (Technical Pre-requisites), DGK (Digital knowledge of the project manager), CDT (Changes in the project manager's job due to the AI-driven digital transformation) and AIM (AI-driven digital maturity of the organization). When analyzing complex models where the constructs cannot be directly observed, structural equation modeling (SEM) is particularly helpful because it offers a deeper understanding of the theoretical framework (Ringle & Sarstedt, 2016). By utilizing bootstrap procedures to assess the

hypotheses and relationships between latent constructs, all hypotheses with significant positive relationships can be accepted based on the T statistics (as observed in Figure 1).

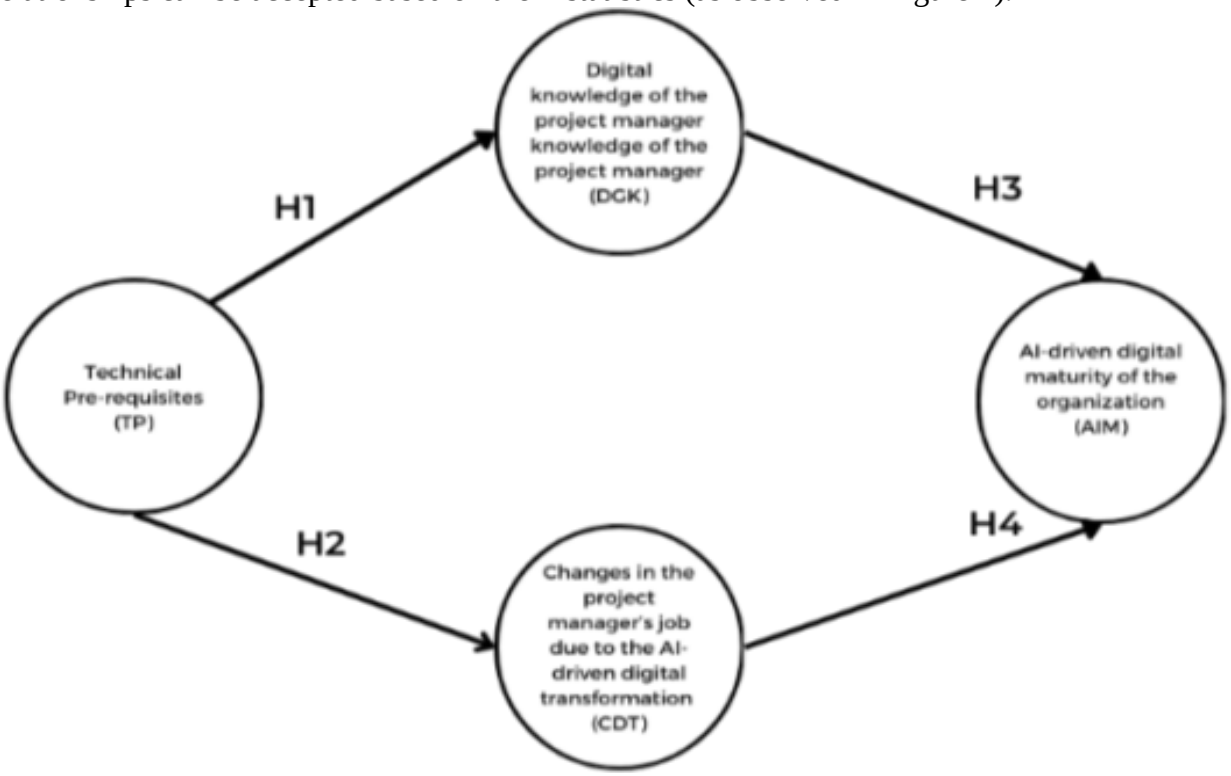

Figure 1. Conceptual model

Source: Authors own elaboration.

Table 2 indicates that all variables have coverage validity, aspect that is supported by the fact that all items are meeting the minimum threshold of 0.70 (Umar Ong & Ameeden, 2023), the minimum value being 0.710 for the DGK9 item. The values of Cronbach's α are above 0.7 (the value for TP is 0.739, the value for DGK is 0.843, the value for CDT is 0.830 and the value for AIM is 0.978); thus, according to Taber (2018), these values helped to establish the reliability of the constructs. More than that, according to Hair et al. (2021), if the average variance extracted (AVE) has a value over 0.5 (in our case, for TP the AVE has a value of 0.656, for DGK the AVE has a value 0.608, for CDT the AVE values 0.608 and for AIM the AVE has a value of 0.848), then these items exhibit validity convergence as well.

Table 2. Scale reliability for the constructs in the model

Item	Measure	Loading	α/CR/AVE
TP5	My skills in defining technical aspects of projects are solid.	0.820	0.739/ 0.851 /0.656
TP6	My technical expertise is regularly updated with everything new that is relevant to my job.	0.851	
TP9	I know how our organization deals with disruption beyond the framework of my projects.	0.756	
DGK2	I keep up-to-date with the latest trends in digital transformation.	0.816	0.843 / 0.886 / 0.608
DGK3	My digital literacy gives me an advantage in project execution.	0.788	
DGK4	I understand how to leverage data analytics in project management.	0.798	
DGK7	I know how to integrate digital technologies for cross-functional collaboration.	0.784	
DGK9	I fully understand what AI means for my job.	0.710	
CDT1	The planning of projects is more efficient due to using digital instruments.	0.745	0.830 / 0.885 / 0.659
CDT2	Digital transformation improves resource allocation in projects.	0.734	

Factor loading > 0.7; Cronbach's Alpha > 0.7; Average variance extracted (AVE) > 0.5; Composite reliability > 0.7.
Source: Authors` own research results.

Table 3. points out the direct and indirect effects computed in SmartPLS 4.0.

Table 3. The path coefficients of the structural equation model

Paths	Path Coefficients	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	Bias	P values	Hypotheses
TP -> DGK	0.483	0.489	0.065	7.467	0.006	0.000	H1->Accepted
TP -> CDT	0.298	0.301	0.073	4.078	0.003	0.000	H2->accepted
DKT -> AIM	0.361	0.360	0.064	5.633	-0.001	0.000	H3->accepted
CDT -> AIM	0.444	0.445	0.055	8.045	0.001	0.000	H4->accepted

Note: TP (Technical Pre-requisites), DGK (Digital knowledge of the project manager), CDT (Changes in the project manager's job due to the AI-driven digital transformation) and AIM (AI- driven digital maturity of the organization)
Source: Authors` own research results

Thus, hypothesis 1 (H1) indicates that technical pre-requisites have a positive influence on the digital knowledge of the project manager. A moderately good impact is pointed out by the path coefficient of 0.483. The very low p-value (0) and the high T-value (7.467) offer strong statistical support for the significance of this positive influence over chance. In addition, observable are the Sample Mean (0.489) and the STDEV (0.065), which highlight the sample's comparatively high mean value and small standard deviation, which suggest low variability within the sample given the data points' close clustering around the mean. The results (Path Coefficients = 0.483; M = 0.489;

STDEV = 0.065; T-value = 7.467; $p < 0.001$) show an intense and strong positive relation, therefore H1 can be accepted.

Hypothesis 2 (H2) supported that technical pre-requisites have a positive influence on the changes in the project manager's job due to the AI-driven digital transformation. The path coefficient of 0.298 indicates a positive relationship, meaning that as one variable increases, the other variable tends to increase as well. The mean (0.301) is very close to the observed path coefficient (0.298), suggesting consistency in the relationship. The standard deviation (STDEV = 0.073) shows that there is relatively low variability around this mean, indicating that the path coefficient is stable and reliable across different samples. The high T-value (4.078) and very low p-value (0) indicate strong evidence that this relationship is not due to chance. The results (Path Coefficients = 0.298; M = 0.301; STDEV = 0.073; T-value = 4.078; $p < 0.001$) show an intense and strong positive relation between technical pre-requisites and the changes in the project manager's job due to the AI-driven digital transformation, therefore H2 can be accepted.

Hypothesis 3 (H3) assumed that digital knowledge of the project manager has a positive influence on the AI-driven digital maturity of the organization, as evidenced by a high path coefficient of 0.361. The mean (0.360) is nearly identical to the path coefficient, which suggest consistent results across samples and the standard deviation (0.064) is relatively low, which points out that the path coefficient is stable and reliable. The T-value of 5.633, along with a p-value (0), confirms that this relationship is highly significant and unlikely to be due to chance. Thus, the results (Path Coefficients = 0. 361; M = 0.360; STDEV = 0.064; T-value = 5.633; $p < 0.001$) show an intense and strong positive relation between the two constructs, therefore H3 can be accepted.

The last hypothesis (H4) points out that changes in the project manager's job due to the AI-driven digital transformation have a positive influence on the AI-driven digital maturity of the organization, this being supported as observed in Table 3 by the value of the path coefficient of 0.444. The mean (0.445) is indicating consistency in the estimated relationship across samples and the low standard deviation (0.055) suggests that this relationship is stable and reliable. The high T-value of 8.045, combined with a p-value (0), confirms that the relationship is not due to chance and is highly significant. The results (Path Coefficients = 0.444; M = 0.445; STDEV = 0.055; T-value = 8.045; $p < 0.001$) show an intense and strong positive relation between the two constructs, therefore H4 can be accepted.

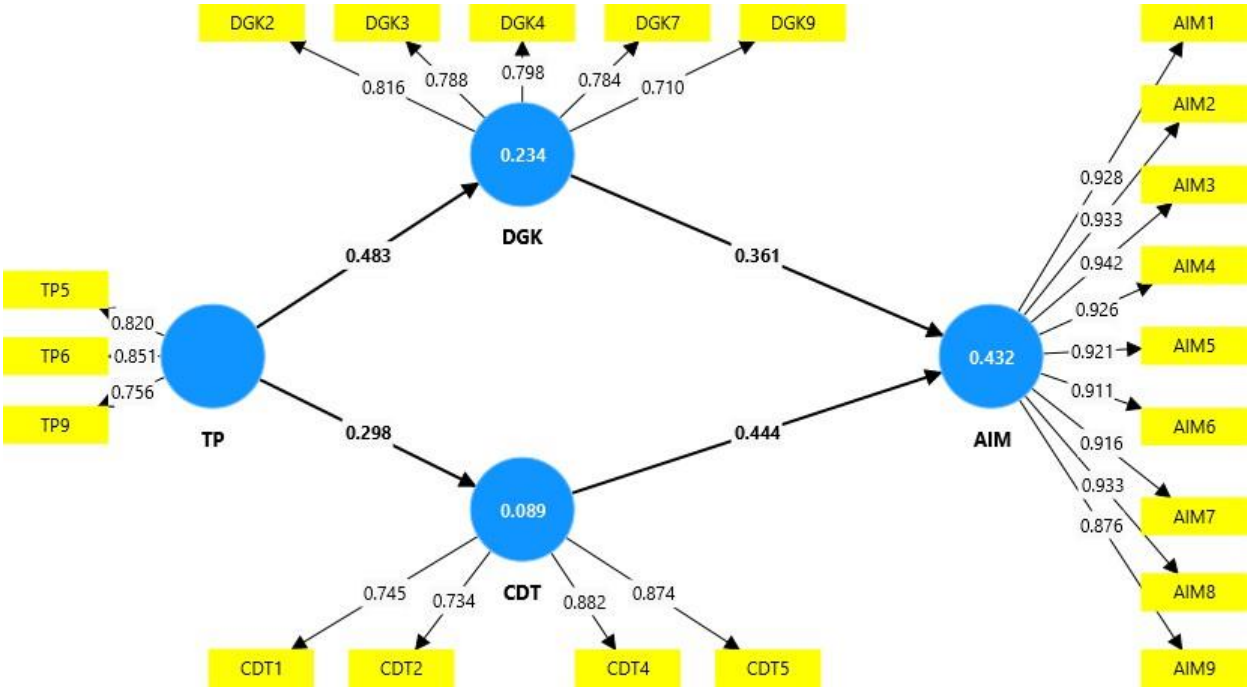

Figure 2. Structural model
Source: Authors own elaborationusing SmartPLS4.0 Software.

Discussions

As observed in the previous section, all hypothesis were validated by the data.

The first hypothesis indicates that technical pre-requisites have a positive influence on the digital knowledge of the project manager. Recent studies (Obradović et al., 2018) highlight how project managers' roles are changing in the digital age, with a balanced emphasis on both conceptual and interpersonal skills replacing a narrow focus on technical competencies. This relationship implies that a project manager's capacity to successfully manage and carry out digital projects is directly influenced by their technical skill base, which includes knowledge of software tools, data analysis, and digital communication platforms (Avença et al., 2023; Đajić et al., 2024). The necessity for project managers to handle intricate digital systems means that their technical competence is essential to the project's success, highlighting the advantages of having technical prerequisites for their digital literacy (Jena & Satpathy, 2017).

The second hypothesis supports that technical pre-requisites have a positive influence on the changes in the project manager’s job due to the AI-driven digital transformation. Mariani and Mancini (2023), underlined in their research that managers possessing solid technical backgrounds are better suited to adjust to the new tools, procedures, and methods of decision-making generated by AI technologies, as the integration of AI into project management continues to grow. According to some scholars (Alshaikhi & Khayyat, 2021; Nenni et al., 2024), as AI continues to transform the field of project management, technical expertise becomes an invaluable asset for project managers. The third hypothesis assumed that digital knowledge of the project manager has a positive influence on the AI-driven digital maturity of the organization. Project managers are better equipped to lead their organizations through the challenges of digital transformation because they have a deeper understanding of digital tools and AI technologies (Fridgeirsson et al., 2021; Karamthulla et al.,

2024; Oyekunle et al., 2024). Their ability to apply AI solutions strategically is made possible by this expertise, which promotes increased integration and advancement of digital capabilities throughout the company (Gonçalves et al., 2023). Thus, as Bakam Fotso et al. (2022) stated, knowledgeable project managers' effective use of AI speeds up the process of raising the organization's level of digital maturity.

Last but not least, the fourth hypothesis points out that changes in the project manager's job due to the AI-driven digital transformation have a positive influence on the AI-driven digital maturity of the organization. The adoption of AI methods and resources by project managers is crucial to the advancement of the organization's digital maturity (Taboada et al., 2023; Fenwick et al., 2024). According to Gupta (2022), the organization's capacity to integrate and exploit the benefits of AI technologies is improved by these role adaptations, which also include embracing new approaches and utilizing AI insights.

Conclusion

This research paper offers significant knowledge on how AI can be integrated into project management, highlighting the critical roles that organizational maturity, job shifts, digital literacy, and technical prerequisites have in promoting AI adoption. The study used structural equation modeling to investigate the connections between these variables and their effects on AI-driven digital transformation in businesses. The results highlight how technological prerequisites help project managers acquire the digital skills they need, which in turn helps organizations become more AI-mature overall. The study also shows how AI-driven shifts in project management responsibilities have a big influence on a company's ability to adapt and succeed in a business environment that is becoming more and more digital.

This research is important since it has implications for both industry and academics. For academics, the study provides a systematic framework for comprehending AI adoption in project management, as well as empirical confirmation of theoretical components. By exploring how technological, managerial, and organizational aspects interact, it builds on previous research and enhances the body of knowledge on artificial intelligence and project management. Regarding the main areas businesses should prioritize on when integrating AI into project management processes, the results provide practitioners with insightful guidance. Thus, organizations may create focused training programs, put in place helpful AI policies, and create an environment that encourages technological innovation by realizing the value of digital capabilities and organizational agility.

It should be noted that this study has a number of limitations despite its contributions. First of all, this research was conducted on self-reported data, which might lead to response biases and future research should include qualitative interviews or case studies to survey-based methods to further understand the challenges brought by AI adoption. More than that, in terms of versatility, the research's focus on project management professionals from European countries provides a limitation because the results could not be completely relevant to all types of industries. Thus, the sample should be enlarged in future research to include professionals from a wider range of geographic and industrial backgrounds in order to obtain a greater understanding of AI adoption in various business environments.

Further research should investigate additional variables including organizational culture and leadership support that can have an impact on the integration of AI in project management. Furthermore, examining the effects of various AI technologies on project management processes within different industries could provide insightful information. Addressing up these gaps will

allow future research to broaden on the research done so far and offer a deeper understanding of how AI will impact project management in the future.

References

Alshaikhi, A. & Khayyat, M. (2021). An investigation into the Impact of Artificial Intelligence on the Future of Project Management. *2021 International Conference of Women in Data Science at Taif University (WiDSTaif),* 1-4. http://doi.org/10.1109/WiDSTaif52235.2021.9430234.

Agarwal, R., & Prasad, J. (1998). The antecedents and consequents of user perceptions in information technology adoption. *Decision support systems*, *22*(1), 15-29.

AlAli, A. A. H. (2022). Effect of technological orientation on Project Management process and infrastructure performance of RTA in UAE. *Journal of International Business and Management*, *5*(3), 01-26.

Alamelu, K. (2013). Digital inclusion-a conceptual framework. *International Journal of Advanced Research in Management and Social Sciences*, *2*(12), 228-248.

Avença, I., Domingues, L., & Carvalho, H. (2023). Project Managers soft skills influence in knowledge sharing. *Procedia Computer Science, 219*, 1705-1712. https://doi.org/10.1016/j.procs.2023.01.464 .

Baier, L., Jöhren, F., & Seebacher, S. (2019, June). Challenges in the Deployment and Operation of Machine Learning in Practice. In *ECIS* (Vol. 1).

Bakam Fotso, G., Pradhan, A., & Sukdeo, N. (2022). Importance of Artificial Intelligence in Technology Project Management. In *1st Australian International Conference on Industrial Engineering and Operations Management*. https://doi.org/10.46254/AU01.20220302 .

Basha, S. M., & Rajput, D. S. (2019). Survey on evaluating the performance of machine learning algorithms: Past contributions and future roadmap. In Sangaiah, A. K. (Ed.). (2019) *Deep Learning and Parallel Computing Environment for Bioengineering Systems* (pp. 153-164). Elsevier Academic Press.

Bierwolf, R., Romero, D., Pelk, H., & Stettina, C. J. (2017, June). On the future of project management innovation: A call for discussion towards project management 2030. In *2017 International Conference on Engineering, Technology and Innovation (ICE/ITMC)* (pp. 689-698). IEEE.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 319-340.

Đajić, M.J., Lalic, D.C., Vujičić, M.D., Stanjov, U., Petrovic, M., & Đurić, Z. (2024). Development and validation of the project manager skills scale (PMSS): An empirical approach. *50 Heliyon, 10*(3). https://doi.org/10.1016/j.heliyon. 2024.e25055 .

DiGiuseppe, M., Childs, E., Blayone, T., & Barber, W. (2017, June). Are you ready? Assessing digital competencies for online learning via the General Technology Confidence and Use (GTCU) Instrument. In *EdMedia+ Innovate Learning* (pp. 221-226). Association for the Advancement of Computing in Education (AACE).

Felicetti, A. M., Cimino, A., Mazzoleni, A., & Ammirato, S. (2024). Artificial intelligence and project management: An empirical investigation on the appropriation of generative Chatbots by project managers. Journal of Innovation & Knowledge, 9(3), 100545.

Fenwick, A., Molnar, G. & Frangos, P. (2024). The critical role of HRM in AI-driven digital transformation: a paradigm shift to enable firms to move from AI implementation to

human-centric adoption. *Discover Artificial Intelligence, 4*(34). https://doi.org/10.1007/s44163-024-00125-4 .

Fridgeirsson, T.V., Ingason, H.T., Jonasson, H.I., Jonsdottir, H. (2021). An Authoritative Study on the Near Future Effect of Artificial Intelligence on Project Management Knowledge Areas. *Sustainability, 13*, 2345. https://doi.org/10.3390/su13042345 .

Gonçalves, M. L. A., Penha, R., Silva, L. F., Martens, C. D. P., & Silva, V. F. (2023). The relationship between project management and digital transformation: Systematic literature review. RAM. *Revista De Administração Mackenzie, 24*(4). https://doi.org/10.1590/1678-6971/eRAMR230075.en .

Gupta, S. (2022). Artificial Intelligence, Analytics and Agile: Transforming Project Management in the 21st Century. *International Journal of Recent Technology and Engineering, 11*(1), 1-8. http://doi.org/10.35940/ijrte.G6877.0511122.

Hair, J.F., Hult, G.T.M., Ringle, C.M., Sarstedt, M., Danks, N.P., Ray, S. (2021). Evaluation of Reflective Measurement Models. In: *Partial Least Squares Structural Equation Modeling (PLS- SEM) Using R. Classroom Companion: Business*. https://doi.org/10.1007/978-3-030-80519-7_4.

Hall, B. H., & Khan, B. (2003). Adoption of new technology. NBER Working Paper Series No. 9730, May.

Holmström, J. (2022). From AI to digital transformation: The AI readiness framework. *Business Horizons, 65*(3), 329-339.

Jena, A. & Satpathy, S.S. (2017). Importance of Soft Skills in Project Management. *International Journal of Scientific Research and Management, 5*(7), 6173-6180. http://doi.org/10.18535/ijsrm/v5i7.45.

Jöhnk, J., Weißert, M., & Wyrtki, K. (2021). Ready or not, AI comes—an interview study of organizational AI readiness factors. *Business & Information Systems Engineering, 63*(1), 5-20.

Joshi, H. (2024). Artificial Intelligence in Project Management: A Study of The Role of AI-Powered Chatbots in Project Stakeholder Engagement. *Indian Journal of Software Engineering and Project Management (IJSEPM),* 4(1), 20-25.

Juma, C. (2016). *Innovation and its enemies: Why people resist new technologies*. Oxford University Press.

Karamthulla, M.J., Tadimarri, A., Tillu, R., Muthusubramanian, M. (2024). Navigating the Future: AI-Driven Project Management in the Digital Era. *International Journal For Multidisciplinary Research, 6*(2). https://doi.org/10.36948/ijfmr. 2024.v06i02.15295.

Katari, P., Thota, S., Chitta, S., Venkata, A. K. P., & Ahmad, T. (2021). Remote Project Management: Best Practices for Distributed Teams in the Post-Pandemic Era. *Australian Journal of Machine Learning Research & Applications*, 1(2), 145-167.

Khan, S., & Khan, S. U. (2024). Tourist motivation to adopt smart hospitality: the impact of smartness and technology readiness. *Journal of Hospitality and Tourism Insights*.

Kordon, A. (2020). Applied artificial intelligence-based systems as competitive advantage. *In 2020 IEEE 10th International Conference on Intelligent Systems (IS)* (pp. 6-18). IEEE. https://doi.org/10.1109/IS48319.2020.9200097

Lahmann, M. (2017). AI will transform project management. Are you ready?. *PwC Insights*. Available online at https://www.pwc.ch/en/insights/risk/ai-will-transform-project-management-are-you-ready.html.

Li, W., Yigitcanlar, T., Erol, I., & Liu, A. (2021). Motivations, barriers and risks of smart home adoption: From systematic literature review to conceptual framework. *Energy Research & Social Science, 80*, 102211.

Maruping, L. M., & Magni, M. (2015). Motivating employees to explore collaboration technology in team contexts. *Mis Quarterly*, *39*(1), 1-16.

Minelle, F., & Stolfi, F. (2023). AI to support PM: a ChatGPT quality assessment (ß test). *PM World Journal*, Vol. XII, Issue V. Available at: https://pmworldlibrary. net/wp-content/uploads/2023/05/pmwj129-May2023-Minelle-Stolfi-AI-tosupport-PM-a-ChatGPT-quality-assessment-3-1.pdf.

Nenni, M. E., De Felice, F., De Luca, C., & Forcina, A. (2024). How artificial intelligence will transform project management in the age of digitization: a systematic literature review. *Management Review Quarterly*, 1-48.

Ngereja, B. J., & Hussein, B. (2022). Employee learning in the digitalization context: An evaluation from team members' and project managers' perspectives. *Procedia Computer Science*, *196*, 902-909.

Niederman, F. (2021). Project management: openings for disruption from AI and advanced analytics. *Information Technology & People*, 34(6), 1570-1599.

Nieto-Rodriguez, A., & Vargas, R. V. (2023). How AI will transform project management. *Harvard Business Review*. Available online at https://hbr.org/2023/02/how-ai-will-transform-project-management.

Pînzaru, F., Dima, A. M., Zbuchea, A., & Vereș, Z. (2022). Adopting sustainability and digital transformation in business in Romania: A multifaceted approach in the context of the just transition. *Amfiteatru Econ*, *24*(59), 27-44.

PMI (2024a). *Reframing Project Success. How do we measure project success? Pierre Le Manh, president and CEO of PMI kicked off a fresh debate during his keynote address at PMI Global Summit 2024.* Available at https://www.pmi.org/blog/reframing-project-success.

PMI (2024b). Pushing the Limits: Transforming Project Management with GenAI Innovation Report. Available at https://www.pmi.org/learning/thought-leadership/transforming-project-management-with-generative-ai.

Rane, N. (2023). Role and Challenges of ChatGPT and Similar Generative Artificial Intelligence in Business Management. http://dx.doi.org/10.2139/ssrn.4603227.

Ratchford, M., & Barnhart, M. (2012). Development and validation of the technology adoption propensity (TAP) index. *Journal of Business Research, 65*(8), 1209-1215.

Santos, J. I., Pereda, M., Ahedo, V., & Galán, J. M. (2023). Explainable machine learning for project management control. *Computers & Industrial Engineering*, 180, 109261.

Sawang, S., Sun, Y., & Salim, S. A. (2014). It's not only what I think but what they think! The moderating effect of social norms. *Computers & Education*, *76*, 182-189.

Saxena, S. (2017). Enhancing ICT infrastructure in public services: Factors influencing mobile government (m-government) adoption in India. *The Bottom Line*, *30*(4), 279-296.

Sahadevan, S. (2023). Project Management in the Era of Artificial Intelligence. *European Journal of Theoretical and Applied Sciences, 1*(3), 349-359. http://doi.org/10.59324/ejtas.2023.1(3).35

Shaik, T., Tao, X., Li, Y., Dann, C., Mcdonald, J., Redmond, P., & Galligan, L. (2022). A Review of the Trends and Challenges in Adopting Natural Language Processing Methods for Education Feedback Analysis. *IEEE Access*, *10*, 56720-56739. http://doi.org/10.1109/ACCESS.2022.3177752

Shenhar, A. J. (1993). From low- to high- tech project management. *R&D Management*, *23*(3), 199-214.

Szczepańska-Woszczyna, K., & Gatnar, S. (2022, September). Key competences of research and development project managers in high technology sector. In *Forum Scientiae Oeconomia* (Vol. 10, No. 3, pp. 107-130).

Tehrani, A. N., Ray, S., Roy, S. K., Gruner, R. L., & Appio, F. P. (2024). Decoding AI readiness: An in-depth analysis of key dimensions in multinational corporations. *Technovation*, *131*, 102948.

Thamhain, H. J. (1991, September). Developing project management skills. *Project Management Institute*.

Tsou, H. T. (2022). Linking customization capability with crm technology adoption and strategic alignment. *Service Science*, *14*(1), 60-75.

Ul Musawir, A., Abd-Karim, S. B., & Mohd-Danuri, M. S. (2020). Project governance and its role in enabling organizational strategy implementation: A systematic literature review. *International Journal of Project Management*, *38*(1), 1-16.

Walker, D., & Lloyd-Walker, B. (2019). The future of the management of projects in the 2030s. *International journal of managing projects in business*, 12(2), 242-266.

Wang, S., Li, X., Li, Z., & Ye, Y. (2023). The effects of government support on enterprises' digital transformation: Evidence from China. *Managerial and Decision Economics*, *44*(5), 2520-2539.

Whyte, S., & Whyte, S. (2015). Gaining Confidence: Developing a Technical Repertoire. *Implementing and Researching Technological Innovation in Language Teaching: The Case of Interactive Whiteboards for EFL in French Schools*, 150-170.

Wilson, H. J., & Daugherty, P. R. (2018). What Changes When AI Is So Accessible That Everyone Can Use It?. *Harvard Business Review*, January, 30.

Yang, X., Song, B., Chen, L., Ho, S. S., & Sun, J. (2025). Technological optimism surpasses fear of missing out: A multigroup analysis of presumed media influence on generative ai technology adoption across varying levels of technological optimism. *Computers in Human Behavior*, *162*, 108466.

Zadeh, E. K., Khoulenjani, A. B., & Safaei, M. (2024). Integrating AI for agile Project Management: Innovations, challenges, and benefits. *International Journal of Industrial Engineering and Construction Management (IJIECM)*, *1*(1), 1-10.

Zia, M. T., Nadim, M., Khan, M. A., Akram, N., & Atta, F. (2024). The Role of Artificial Intelligence on Project Management. *The Asian Bulletin of Big Data Management*, 4(02), Science-4.

Zingora, T., Stark, T. H., & Flache, A. (2020). Who is most influential? Adolescents' intergroup attitudes and peer influence within a social network. *Group Processes & Intergroup Relations*, *23*(5), 684-709.