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DIGITAL TRANSFORMATION AS A DETERMINANT OF CHANGES IN PROJECT TEAM COMPETENCIES

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Purpose: The aim of this paper is to identify the competencies required of project team members in the context of the ongoing digitalization of project management.
Design/methodology/approach: The study adopts an approach combining a literature review with empirical research. The theoretical part provides a review of current literature on digital transformation and competency changes in project management. The empirical part is based on a survey conducted among 104 respondents professionally involved in project management.
Findings: Digital transformation is reshaping the way projects are delivered, as evidenced by a significant increase in the use of digital tools, data analytics, and artificial intelligence. At the same time, the role of remote work and virtual project teams is growing. However, key project team competencies are not limited to digital and analytical skills. Competencies such as communication, collaboration, responsibility, adaptability, and problem-solving are gaining increasing importance.
Research limitations/implications: The main limitation of the study is the size and nature of the research sample (104 respondents), which restricts the generalizability of the findings. Future research will involve expanding the sample, enabling the application of statistical methods and a more in-depth analysis of the relationship between the level of digitalization and project team competencies.
Practical implications: The findings indicate the need to adapt training systems by integrating digital and analytical competencies with social and leadership competencies in the context of the growing importance of remote work and artificial intelligence.
Social implications: The results may support the development of educational policies and competency development programs aligned with the needs of the digital economy.
Originality/value: The study highlights the integrated nature of project team competencies, combining technological and social dimensions. It also identifies the paradox of the increasing importance of interpersonal and leadership competencies in the context of intensive digitalization and the dynamic development of artificial intelligence.
Keywords: Keywords: digital transformation, project management, project team competencies, artificial intelligence, virtual teams.
Category of the paper: Research paper.

1. Introduction

The dynamic environment, increasing project complexity, and ongoing digitalization necessitate the adoption of new approaches and tools to support effective project delivery. Digital transformation, encompassing the development of information technologies, data analytics, and artificial intelligence, is fundamentally reshaping management processes. Consequently, it becomes essential to identify the competencies required of project team members to ensure their effective functioning in the context of digital transformation.

The aim of this paper is to identify the competencies required of project team members in the context of the ongoing digitalization of project management. The study adopts an approach combining a literature review with empirical research. The theoretical part provides an overview of current publications on digital transformation, artificial intelligence, remote work, virtual project teams, and competency changes in project management. The empirical part presents the results of an original survey conducted among 104 respondents professionally involved in project management. Respondents shared their perspectives on changes observed in project work due to digitalization and the resulting shifts in required competencies. The findings provide valuable insights for both researchers and practitioners by identifying the competency needs of project teams in the context of digital transformation and the growing role of artificial intelligence.

2. Digitalization, AI, and competency changes in project teams – literature review

Ongoing digital transformation is one of the key factors shaping contemporary project management. The development of information and communication technologies, data analytics, and artificial intelligence is changing the way projects are planned, executed, and monitored (Adeniran et al., 2024; Lima et al., 2023). Digitalization facilitates the integration of data, tools, and processes within shared information environments, enhancing the transparency of project activities and supporting data-driven decision-making (Liu et al., 2024; Gorski et al., 2024). Artificial intelligence plays a particularly important role in the digitalization process. AI can support the automation of selected tasks, improve the analysis of project data, and serve as a tool for supporting risk and resource management (Savio, Ali, 2023; Pinzaru et al., 2025). At the same time, the effectiveness of AI-based solutions depends on organizational conditions, including technical readiness, the level of digital literacy, and organizational maturity, which determine the actual benefits of AI in project practice (Pinzaru et al., 2025; Marnewick, 2025). As a result, digital transformation goes beyond purely technical changes and requires

adaptations in management practices, decision-making processes, and learning mechanisms within project-based organizations (Lima et al., 2023).

The literature also highlights potential tensions and risks associated with digitalization. Increasing reliance on AI-enabled systems may strengthen technological dependence, posing a challenge to maintaining a balance between automation and the decision-making autonomy of project team members (Felcenloben, 2023). From this perspective, digitalization should be accompanied by the simultaneous development of both digital and social competencies to ensure that technology enhances team agency rather than undermines it (Bushuyev et al., 2024). The growing role of artificial intelligence should not marginalize the human role but rather transform it. AI should be seen as a tool that supports decision-making and analytical processes; however, its effective use requires competencies such as critical thinking, decision-making responsibility, and the ability to collaborate with technology (Adegbite et al., 2023; Pinzaru et al., 2025). In this context, the integration of technological, social, and cognitive competencies becomes essential (Rincon-Guio et al., 2023; Dani et al., 2025).

The development of digital technologies fosters the widespread adoption of remote work and the growth of virtual teams, affecting how projects are coordinated, communicated, and controlled (Teichert et al., 2024; Blak Bernat et al., 2023). A geographically dispersed environment requires the use of digital tools to enable collaboration and ensure the continuity of information flows; however, it also entails the risk of reduced communication quality and challenges in maintaining team cohesion (Blak Bernat et al., 2023). In such contexts, a clear division of roles and transparency of activities become particularly important, underscoring the need to deliberately establish collaboration rules in virtual environments (Wawak, 2024; Teichert et al., 2024; Peszko et al., 2025).

These changes in project execution lead to a redefinition of competency requirements for both project managers and project team members. The literature emphasizes the growing demand for digital and analytical competencies, including the ability to work with data, understand AI-enabled tools, and integrate digital solutions into project practice (Liu et al., 2024; Pinzaru et al., 2025). These competencies are essential for effective functioning in project environments characterized by the increasing importance of information and automation (Savio, Ali, 2023). However, digital transformation cannot be limited to the technological dimension alone; it must also reinforce the importance of social and leadership competencies. The role of leadership competencies in digital environments is particularly emphasized, including communication, supporting team adaptation, and shaping conditions conducive to collaboration in the context of technological change (Marnewick, 2025). From a managerial perspective, project success also depends on the ability to integrate technological, relational, and organizational dimensions, which is especially important in conditions of increasing complexity and stakeholder pressure (Al-Nimer et al., 2024).

The importance of social and communication competencies becomes particularly evident in teams operating in virtual environments. Research indicates that the effectiveness of remote and distributed work depends less on the digital tools employed and more on the quality of communication, collaboration, and trust within the team (Blak Bernat et al., 2023; Teichert et al., 2024). In this context, competencies related to organizing collaboration, accountability, and maintaining team cohesion under remote working conditions become critical (Wawak, 2024). The competencies of project managers and project teams associated with project success are primarily social in nature (e.g., communication, leadership, emotional intelligence) (Ochoa Pacheco et al., 2023; Stan et al., 2024). The literature also highlights the need to develop competency models that integrate the technological dimension with a human-centric approach, emphasizing the interaction between humans and technology and the design of organizational processes around human needs and capabilities (Dani et al., 2025, pp. 6-9). This perspective underscores the necessity of maintaining a balance between technological development and the role of humans in future projects.

Synthesizing the insights from the literature leads to the conclusion that digital transformation creates a dual competency challenge: on the one hand, it requires the development of digital and analytical competencies; on the other, it reinforces the importance of communication, collaboration, and leadership. This theoretical perspective provides the foundation for the objectives of the empirical study, aimed at identifying changes in the digitalization of project management and determining the competencies of project team members considered critical in the context of digital transformation.

3. Methodology of the study

The study was conducted using a Computer-Assisted Web Interviewing (CAWI) survey and took place from April to December 2025. The sample consisted of 104 postgraduate students enrolled in the “Project Management” programme at the Krakow School of Business (KSB), Cracow University of Economics. Most respondents had professional experience, with the largest groups having 10-20 years (40.4%) and 5-10 years (34.6%) of work experience. Shorter experience (up to 5 years) was reported by 16.3% of respondents. In terms of project experience, 38.5% of respondents had participated in 1-5 projects, 25% in 6-10 projects, and as many as 34.6% in more than 10 projects (including 22.1% in more than 15 projects). This indicates that a substantial proportion of the sample possessed practical project experience. The dominant mode of work among respondents was hybrid (46.2%), followed by on-site work (40.4%), while 13.5% of respondents worked fully remotely. This highlights the importance of flexible work arrangements within the studied group. The age structure shows that the majority of respondents

were aged 25-39 (74%), while 24% were aged 40–55. Women accounted for 59.6% of the sample and men for 40.4%.

The results are presented as a percentage distribution of respondents' answers. The main objective of the study was divided into two specific objectives:

Identifying changes in the digitalization of project management.

Determining the competencies of project team members in the context of digital transformation.

To address the first objective of the study, respondents were asked to identify and assess changes that have occurred over the past decade, as well as to forecast future changes in selected areas of project management (Table 1). In addition, respondents were asked to evaluate the impact of remote work on project management (Figure 1) and to identify the key aspects of effective remote work in project management (Figure 2). They were also asked about the anticipated role of artificial intelligence in the future of project management (Figure 3). To address the second objective, respondents were asked to indicate which project team competencies are considered important and which are not relevant in project practice (Tables 1 and 2).

4. Digitalization and project team competencies – analysis of the study results

The results presented in Table 1 indicate a clear continuation and intensification of trends related to the digitalization of project processes. Over the past decade, the highest importance was attributed to project process automation and the development of data analytics tools (both 78.8%), as well as the integration of digital tools and platforms (76.9%). Future projections suggest a further strengthening of these trends. Process automation and tool integration achieved the highest levels of expected importance (both 82.7%), while the development of data analytics tools reached 81.7%. This indicates that respondents anticipate a continued shift toward data-driven and integrated project management models. A notable increase is also observed in the perceived importance of artificial intelligence in decision-making and analytical processes. While 62.5% of respondents considered its role important in the past decade, this figure increases to 74.0% in future projections.

Project managers' competencies in managing distributed teams were rated comparatively lower in the past decade (47.1%), but their projected importance rises significantly (to 67.3%). This may indicate a growing awareness of the challenges associated with virtual teams. At the same time, the importance of social competencies among project team members remains consistently high (63.5% for the past decade and 66.3% in future projections), suggesting that despite technological advancements, competencies related to collaboration, communication,

and responsibility remain critical for project effectiveness. Interestingly, in the case of the increasing number of virtual project teams, the proportion of respondents expecting this trend to remain important in the future (57.7%) is lower than in the past decade (67.3%). This may suggest that respondents view the trend as already largely established rather than rapidly intensifying.

Table 1.
Assessment of the importance of changes in project management over the past decade and in future projections (n = 104)

Changes	The last decade in project management		The Future of Project Management	
	It was not important	It was important	It will not matter	It will matter
The role of artificial intelligence in project decision-making	14.4%	62.5%	4.8%	74.0%
Process automation in projects	1.9%	78.8%	4.8%	82.7%
Increased integration of tools and platforms	5.8%	76.9%	6.7%	82.7%
Development of data analytics tools	5.8%	78.8%	3.8%	81.7%
Increase in the number of virtual project teams	16.3%	67.3%	9.6%	57.7%
Project managers' competencies in managing distributed teams	20.2%	47.1%	7.7%	67.3%
Increasing importance of soft skills among project managers and team members	12.5%	63.5%	5.8%	66.3%

Source: own study.

Most respondents assess the impact of remote work on project management positively (Figure 1). Half of the respondents (50%) indicated that remote work has a positive impact on project management, while also posing challenges for project managers and teams. This suggests an awareness of the competency changes associated with remote work. Additionally, 19.2% of respondents believe that remote work enables greater flexibility and efficiency in project management. However, despite the predominantly positive assessment, a notable proportion of respondents expressed more critical views. For 9.6%, remote work makes no noticeable difference, while 13.5% indicated that it increases bureaucracy and complicates coordination.

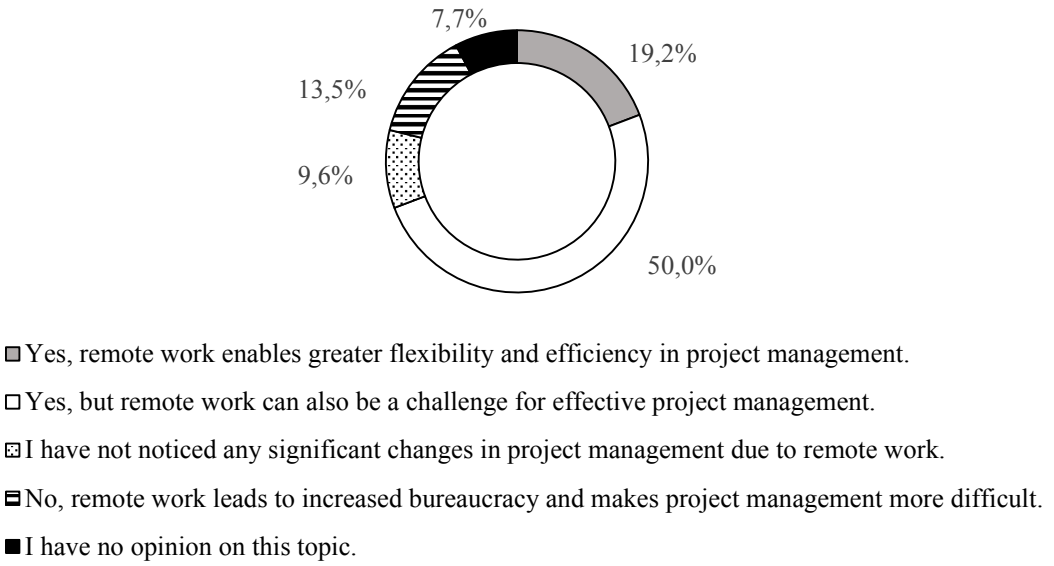


Figure 1. Assessment of the impact of remote work on project management (n = 104).
Source: own study.

Remote work is no longer perceived as a temporary solution but is becoming a permanent element of the project environment, requiring appropriate communication and organizational competencies. The analysis of responses presented in Figure 2 indicates that, according to respondents, the key factors for effective project management in remote work conditions are maintaining team motivation and engagement (40.4%) and effective communication within the team (35%). Far fewer respondents pointed to factors such as access to appropriate digital tools (10.6%), the ability to manage time and schedules (7.7%), and ensuring data security and IT infrastructure (5.8%). These results indicate that effective remote work depends not only on adequate technological infrastructure but also—perhaps more importantly—on social and organizational competencies, particularly in communication, autonomy, and time and task management in a digital environment.

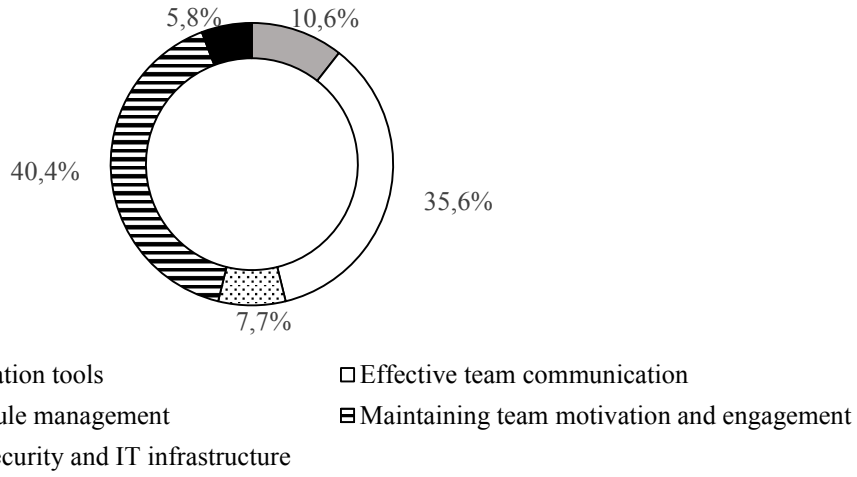
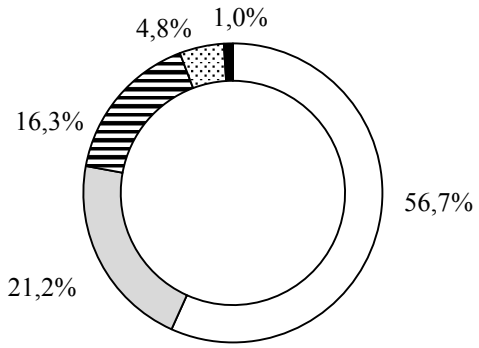


Figure 2. Key factors for effective project management in remote work conditions (n = 104).
Source: own study.

In response to the question regarding the role of artificial intelligence in project management (Figure 3), more than half of the respondents (56.7%) identified AI as a key factor in optimizing project processes in the future. This suggests a growing awareness of AI's potential in areas such as automation, data analysis, risk forecasting, and support for managerial decision-making. At the same time, 21.1% of respondents anticipate only a limited role for AI, which may reflect the view that this technology will support rather than replace traditional managerial competencies. Importantly, despite high expectations regarding AI (Table 1), the results also show a noticeable degree of uncertainty, with 16.3% of respondents unsure about AI's future impact. This uncertainty may stem from concerns about organizations' technological maturity, implementation costs, insufficient digital competencies, or doubts regarding the effectiveness of such solutions. Overall, artificial intelligence is perceived as an important direction of development; however, its future role remains uncertain.



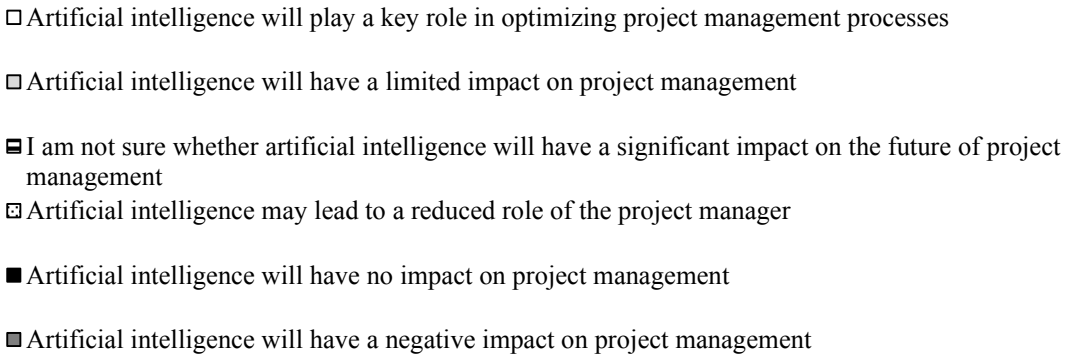


Figure 3. Perceived role of artificial intelligence in project management (n = 104).
Source: own study.

The results indicate that the growing role of digital tools and artificial intelligence is expected to have a significant impact on project effectiveness, which justifies the need to identify the competencies required of project team members in the context of digital transformation. The analysis of data presented in Table 2 shows that domain-specific competencies remain highly important in project work (75%). Technical competencies, such as familiarity with modern project management tools and technologies, received lower (though still substantial) ratings (62.5%).

However, respondents ranked social and adaptive competencies the highest. Responsibility for assigned tasks emerged as the most critical factor (90.4%), followed by teamwork (84.6%), communication with internal and external stakeholders (83.7%), and problem-solving skills (83.7%). Respondents also prioritized the ability to respond quickly to change and decision-making flexibility (78.8%), autonomy (76.0%), and stress resilience (75.0%).

Table 2.
Perceived importance of project team competencies (n = 104)

Competencies	Not important	Important
Domain-specific qualifications	6,7%	75,0%
Project work experience	13,5%	53,8%
Narrow specialization	15,4%	42,3%
Ability to work in a team	0,0%	84,6%
Stress resistance	4,8%	75,0%
Responsibility for assigned tasks	1,0%	90,4%
Problem-solving skills	1,9%	83,7%
Ability to communicate with the project manager	1,9%	79,8%
Creativity	9,6%	66,3%
Autonomy	6,7%	76,0%
Communication within the team and with external stakeholders (including clients)	1,0%	83,7%
Knowledge of modern project management tools and technologies	15,4%	62,5%
Ability to work in intercultural and global teams	12,5%	66,3%
Advanced communication and negotiation skills	6,7%	53,8%
Ability to respond quickly to change and decision-making flexibility	3,8%	78,8%

Source: own study.

Narrow specialization (42.3%) and project work experience (53.8%) received the lowest ratings, suggesting that general competencies are gaining importance at the expense of highly specialized knowledge. This may suggest that, in the context of digital transformation, greater value is assigned to broad, transferable competencies rather than narrowly specialized knowledge.

The results indicate that, despite the growing role of digital tools and artificial intelligence, social, communication, and adaptive competencies remain critical for project effectiveness. While the future of project management is perceived as increasingly data-driven and automated, project success will continue to depend on the quality of communication, leadership, and collaboration in distributed teams.

5. Conclusion

The aim of this paper was to identify the competencies required of project team members in the context of the ongoing digitalization of project management. This objective was achieved by identifying key changes in project management digitalization and determining the competencies considered critical in the context of digital transformation.

Project management is undergoing significant and systemic transformations driven by the development of digital technologies. Both the literature review and the empirical findings indicate that digital transformation encompasses the development of integrated digital platforms, the automation of project processes, the increasing importance of data analytics, and the use of artificial intelligence in decision-making. The results of the present study are consistent with these trends, with respondents identifying automation, tool integration, and the development of data analytics and AI as key directions of change, both over the past decade and in future projections.

At the same time, the findings highlight the growing importance of remote work and virtual project teams as a permanent element of the project environment. While this phenomenon enhances organizational flexibility and access to a global talent pool, it also introduces new challenges related to communication, coordination in distributed teams, and the development of trust and effective knowledge sharing. Digital transformation thus affects not only tools and technologies but also the structure of work and collaboration models in projects.

Although digital transformation is largely driven by technological advancements, the results indicate that social competencies and team responsibility remain critical determinants of project effectiveness. Both the literature and empirical findings emphasize the importance of social and adaptive competencies, including responsibility, teamwork, communication, problem-solving, and decision-making flexibility. While technical and digital competencies remain essential, their effective application depends on well-developed social and leadership competencies.

The findings indicate that the effectiveness of project teams in the context of digitalization depends not only on the level of technological advancement but primarily on the quality of relationships, communication, adaptability, and leadership and decision-making competencies. The growing importance of remote work and virtual teams contributes to the globalization of the labor market, while simultaneously requiring the development of communication, social, and intercultural competencies.

This highlights a key paradox of digital transformation: the greater the importance of technology, data, and artificial intelligence in project management, the more strongly the role of interpersonal and communication competencies is emphasized. The development of digital tools does not diminish the role of the human factor in projects; rather, it increases the demand for communication, leadership, responsibility, and collaboration, which are essential for the effective use of technology in project practice.

The results contribute to the development of knowledge on the future of project management and the competencies of project teams in the context of digital transformation. They point to the need for an integrated approach to competency development, involving the parallel strengthening of technological, analytical, and digital competencies, alongside social, adaptive, and decision-making competencies. Such an approach enables the full utilization of the potential of new technologies while preserving the central role of the human factor in project management.

A limitation of this study is the sample size (104 respondents), which restricts the generalizability of the findings. An additional limitation is the nature of the sample, consisting of postgraduate students in project management, which may influence the structure of respondents' professional experience. Nevertheless, the study provides a basis for further research on the relationship between the level of project management digitalization and the structure of project team competencies.

Future research should involve expanding the sample size, enabling the application of statistical methods and a more in-depth examination of the relationship between the level of digitalization and the competencies required of project teams. A promising direction for further research would also be a comparative analysis of project team competencies across different industries and organizations with varying levels of digital maturity.

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