



The Use of Artificial Intelligence in Project Management

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Abstract

The emergence of new technologies, especially artificial intelligence (AI), disrupts the functioning of organizations on many levels (processes, organization, strategy, communication, finance, etc.). These changes particularly affect the managerial function at the heart of organizations. AI is changing many aspects of managers' work, such as planning, organizing and monitoring work, as well as human resource management, including recruiting, training and developing employees.

Technological advances, including AI, have profoundly influenced project management, leading to significant changes in the way projects are planned, organized, and monitored. Artificial intelligence is playing an increasingly important role in project management, providing managers with useful tools and data for decision-making and resource optimization. This can bring efficiency and precision to project management, helping to achieve set goals more effectively.

The use of these new work tools that make it possible to improve the efficiency of tasks calls into question the existing management practices and requires an upgrade of the skills of managers so that they can fulfill their mission. In addition to the technical skills essential to handling new technological tools, managers must demonstrate emotional intelligence and openness to fulfill their role. Indeed, the introduction of new AI technologies within organizations can have direct and indirect effects on the work of managers. On the one hand, they have to adapt to the technologies that target their own tasks. On the other hand, they need to adapt their management methods to support their employees in the digital transformation that affects other aspects of the organization's operation. In this article, we first outline the main AI technologies used in the managerial field, followed by the advantages and potential these technologies offer to organizations. We then focus on the changes in the role and responsibilities of managers and the new skills they need to develop to succeed in their new work environment. The last part of the article addresses the challenges and problems that the application of these technologies raises in relation to the managerial profession.

Keywords: artificial intelligence, manager, organization, technology

JEL Classification: O32, O36

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Introduction

In the ever-evolving digital age, where innovation and efficiency are fundamental to the success of organizations, Artificial Intelligence (AI) technologies have become a key element in transforming the way we manage and implement projects. With each passing day, AI is spreading its wings more and more into the field of project management, providing considerable opportunities for improving processes, making decisions and achieving goals successfully. In this context, this article explores in depth and detail the use of artificial intelligence technologies in project management. We will explore how AI has become a driving force in effective project management, bringing promises to increase efficiency, reduce risk and optimize resources. Moreover, we will look at this technology's benefits to organizations in all fields and examine concrete case studies that illustrate how AI can be applied to various projects. It will also explore project management professionals' challenges and dilemmas in successfully implementing AI technologies. While technological advances are astounding, they come with the responsibility of managing sensitive data, cybersecurity, and the ethics of using AI in critical project decisions.

This article will examine the future of AI in project management and predict the likely trends and directions in which this relationship will develop in an ever-changing world. In an age when technology is constantly redefining our norms and approaches, it is crucial to understand how AI can revolutionize and improve project management, thereby contributing to the success of organizations around the world.

1. Research Methodology

One methodological requirement of any scientific research concerns the coherence between the objectives, the chosen method, and the systems implemented for data collection. In other words, the methodological approach of the research must be adapted to the type of knowledge that is to appear. Exploratory research was used to structure this article.

Exploratory research represents a fundamental stage in the process of creating a scientific or technical article, having the role of bringing to the fore aspects, concepts or new technologies, which offer a fresh perspective on the subject addressed. In the context of the use of artificial intelligence technologies in project management, exploratory research becomes essential to identify current trends, potential challenges and opportunities, and to develop the most complete and up-to-date approach to the subject. One of the main aspects that makes exploratory research essential in this field is the rapid pace of development of artificial intelligence technologies. This field is constantly changing, with innovations appearing regularly. Therefore, it was necessary to conduct exploratory research to understand in depth what AI technologies are available, how they can be applied in project management and what benefits they can bring in this regard. Another important aspect is identifying the challenges and possible ethical issues associated with the use of artificial intelligence in project management. Exploratory research helps identify these problems and develop solutions or regulations to address them appropriately. For example, the use of decision-making algorithms in project management can raise questions related to transparency, non-discrimination and confidentiality, and exploratory research can help to deepen our understanding of these issues and develop appropriate approaches.

Exploratory research also helps identify case studies and examples of good practice where AI technologies have had a positive impact on project management. These examples

can provide inspiration and guidance for professionals in the field and for researchers who wish to develop their own projects or contribute to the development of this field. Exploratory research contributes to bringing value to the field of project management and promoting progress in it.

2. Literature review

AI for project management

The integration of Artificial Intelligence in project management is becoming more widespread. These tools take the form of different algorithms and machine learning programs, offering the possibility of daily project management and administration without human intervention. Thus, they allow managers to predict the scope, budget and success of the project, create preliminary schedules and automatically allocate material resources and tasks to employees. By using these technologies, it is possible to identify control, monitoring or cost issues with greater precision. (Nobre, 2020). Indeed, AI can assist managers in developing and implementing global strategies. These tasks are by nature easily modellable, as they are based more on rational criteria, such as optimizing turnover or reducing delays in service delivery (Rio-Jeanne, 2019). However, thanks to metadata, AI goes beyond automating simple tasks. It develops an understanding of a project's key deliverables and its various issues. This understanding enables technologies to perform complex tasks, such as generating new ideas or making recommendations and decisions.

Highlights of Project Management Statistics

Project management statistics are a crucial component in this field, providing information and data needed to make informed decisions and improve project management processes. Thus, we aim to explore the key milestones of project management statistics, which are essential tools for evaluating project performance, identifying risks and opportunities, and optimizing resources. Project management statistics allow managers to analyze project-relevant data, understand trends, identify problems, and develop strategies for improvement.

Organizations that consistently adopt project management practices experience a 92% success rate in achieving project objectives.

1. In 2015, only 29% of projects were completed on time and within the proposed budget, while 19% of projects failed completely.
2. 36% of project management software users in the United States indicated that the functionality of the software is a crucial factor in their choice.
3. With a user base of over 20 million, Microsoft Project is one of the most widely used project management tools globally.
4. 98% of survey participants expressed a desire to work remotely at least part of the time throughout their careers, highlighting the need for effective remote project management tools and strategies. (<https://www.techopedia.com/project-management-statistics>).

Trends in Project Management

Project management is an ever-evolving discipline, adapting to changes in the business environment and new technologies that influence how projects are planned, executed and completed. Trends in project management reflect this changing dynamic.

Project management is an essential aspect of organizational and strategic skills, contributing to achieving objectives and increasing competitiveness in a globalized economic landscape. With technologies such as artificial intelligence, automation, and high-speed data management, project management practices are adapting and evolving rapidly. Also, developments in communication and collaboration, such as remote working and virtual teams, have changed the way projects are managed and coordinated.

1. According to a 2020 study by Buffer, 98% of respondents expressed a desire to be able to work remotely to some extent during their careers. This highlights the need to adopt tools and strategies that facilitate effective remote project management.

2. According to forecasts by Gartner, Inc., by 2030, implementing artificial intelligence (AI) will reduce the current workload associated with project management by 80%. This transformation will involve AI taking over traditional project management tasks, including data collection, tracking and reporting. (<https://www.techopedia.com/project-management-statistics>).

Project Management Industry Statistics

As the demand for project management skills continues to grow, it is crucial to have a thorough understanding of the industry's current state. Below are some key statistics that deserve attention (<https://www.techopedia.com/project-management-statistics>):

1. According to the Project Management Institute, the global economy will need 87.7 million project management positions by 2027. This fact opens up new opportunities for project management professionals.

2. Agile methodology is becoming increasingly popular, with 71% of organizations globally reporting that they integrate it to varying degrees. This shift reflects the trend toward more iterative and adaptive approaches to project management.

3. Data suggests that remote project management is here to stay, as 91% of teams use virtual tools for project management. This trend is anticipated to gain in popularity in the coming years.

4. According to the Project Management Institute's latest "Pulse of the Profession" report, high-performing organizations manage to complete 90% or more of their projects on time, on budget, and on target. This underlines the importance of effective project management to achieve success.

5. Regarding the budgetary aspect, 78% of the projects exceed the planned budget or experience delays. This highlights the need for better planning, risk management and foresight to keep costs under control.

6. Proper project planning is considered a top priority for 46% of organizations. This aspect is crucial because effective planning creates the basis for successful project execution.

These project management statistics underscore the continued importance of learning and development for project management professionals who want to achieve success. By keeping abreast of the latest trends and tools, project managers can ensure they are prepared to meet industry demands and bring success to their organizations.

Project management performance statistics:

Project managers constantly work to improve their performance and that of their team. Below are some project management performance statistics that can provide guidance in these efforts:

1. According to Project Manager (2023), the most valuable processes in project management include stakeholder engagement (50%), risk management (40%), planning (35%), and resource management (25%). These processes should be prioritized to improve project performance.

2. Organizations that prioritize developing project management skills are more likely to achieve improved performance (Project Manager, 2023). This underlines the need to invest in the training and continuous development of the team.

3. Analytics applications provide strategic indicators for evaluating overall project performance (Project Manager, 2023). Using data analytics can provide valuable insights to improve performance.

4. Automation can also help improve project management performance by facilitating data visualization, automating processes, and using artificial intelligence (Project Manager, 2023). Project managers can use automation to streamline tasks and gain performance insights.

5. To improve performance, 68% of organizations focus on developing project management skills (Project Manager, 2023). This focus on skill development emphasizes the importance of continuous training and development.

By focusing on these project management performance statistics, project managers can improve both their and their team's performance, ultimately contributing to more successful project management results (<https://quixy.com>). Artificial intelligence is an essential partner in project planning and implementation, providing advanced solutions for their monitoring and control. With the help of AI technologies, material resources and procurement can be managed efficiently, optimizing the workflow and reducing the associated costs. In parallel, artificial intelligence is becoming an indispensable tool in supervising and motivating teams, providing detailed analysis and personalized feedback to improve individual and collective performance. Through its ability to forecast and make data-driven decisions, AI helps to anticipate risks and optimize the path of projects. In human resources administration, artificial intelligence precisely manages salaries and bonuses, ensuring fairness and transparency within the organization. Thus, integrating artificial intelligence in project management is an essential step towards efficiency and sustainable success. (Nobre, 2020).

3. Results

The integration of Artificial Intelligence into project management brings with it several fascinating opportunities and perspectives. Benefits include AI's ability to analyze complex data, optimize processes and anticipate risks, leading to more informed decisions and increased efficiency in project management. However, managerial challenges cannot be ignored, as the implementation of artificial intelligence requires adaptation and management of changes at the organizational level. The transformation of the role of managers becomes inevitable in the context of the integration of AI, as they become coordinators of the collaboration between people and intelligent systems. The skills needed to manage this transformation include technical skills, such as understanding the basic concepts of AI and the ability to interpret the results generated by algorithms.

In addition, the development of personal skills such as adaptability and resilience becomes crucial in the face of continuous changes brought about by technology. In addition, social, relational and interpersonal skills become essential to facilitate effective interaction between team members and intelligent systems.

Integrating artificial intelligence into project management paves the way for increased efficiency, but requires sustained efforts to adapt managerial roles, competencies and skills to new technological realities.

The integration of AI technologies is driving significant transformations in business rules, organizational culture and global performance. Of course, despite numerous studies conducted to identify the main drivers, barriers and business impact of adopting AI technologies, the adoption of AI in management in general and in project management (PM) processes in particular still remains unclear.

The global survey carried out by IPMA and PwC Romania aims to achieve the following key objectives:

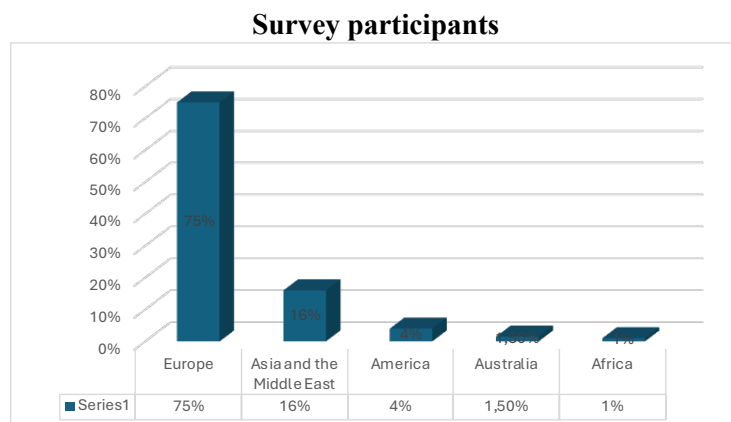
- Evaluation of the perceived stage of AI integration in the field of management and in the management of projects/programs;
- Analysis of the evolution of AI adoption in various project management activities;
- Identifying the key factors that directly and indirectly influence (as mediating factors) the decisions to adopt AI within the PM;
- Identifying the main barriers in the implementation of AI in PM;
- Analysis of the main AI methods and tools used in PM.

Artificial intelligence (AI) research has investigated various issues and approaches since its inception, and progress over the past few decades has been impressive. As we assess capabilities in these areas, there is now a broad consensus that the impact of AI and its influence on society is likely to increase.

The role of artificial intelligence in project management within organizations is undergoing significant changes, especially by providing stakeholders with information based on various data sources. In this report, we investigate trends and projections regarding the adaptation of project management functions to these new trends and assess the impact of artificial intelligence. The target group of the global survey consisted of professionals working in organizations implementing projects, programs and portfolios. During the analysis of the collected data, the following categories of professionals were taken into account: respondents from various regions of the world and with various business roles were asked about the adoption, benefits and obstacles of AI in the various activities in which it is involved. There are many interrelated variables essential to a proper understanding of the future of artificial intelligence (AI), especially the evolution towards general AI with different levels of detail. The method adopted in this research, in addition to analysis, also included a survey conducted among experts.

In this year's survey, respondents from various regions of the world and with various business roles were asked about the adoption, benefits and obstacles of AI in the various activities in which it is involved. The results suggest that AI brings significant value to both companies and individuals. The survey was conducted between March and July 2020 and gathered responses from 295 project management professionals, including IPMA members and potential members, as well as PwC contacts. More than 75% of the 295 participants in the global survey came from Europe, followed by 16% in Asia and the Middle East, 4% in the Americas, 1.5% in Australia and less than 1% in Africa.

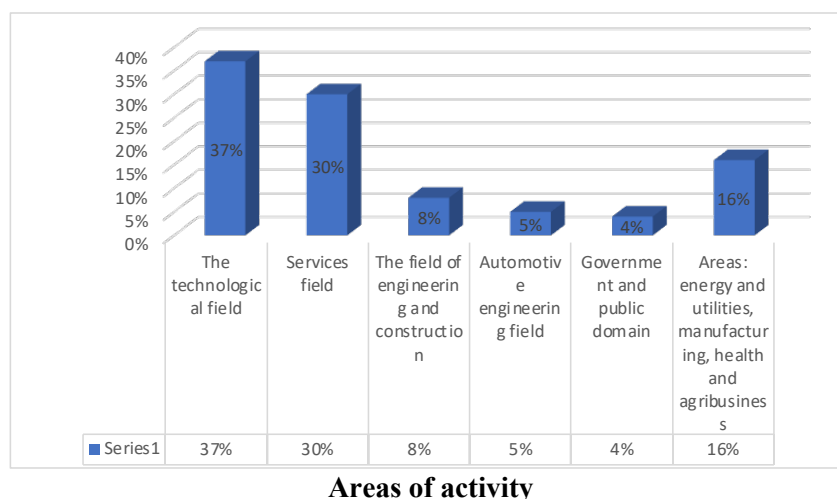
Figure 1.



Source : https://www.ipma.world/assets/IPMA_PwC_AI_Impact_in_PM_-_the_Survey_Report.pdf

Of the respondents, 37% work in technology, 30% in services, 8% in engineering and construction, 5% in the automotive industry, and 4% in the government and public sector. The remaining 16% are engaged in sectors such as energy and utilities, manufacturing, healthcare and agribusiness.

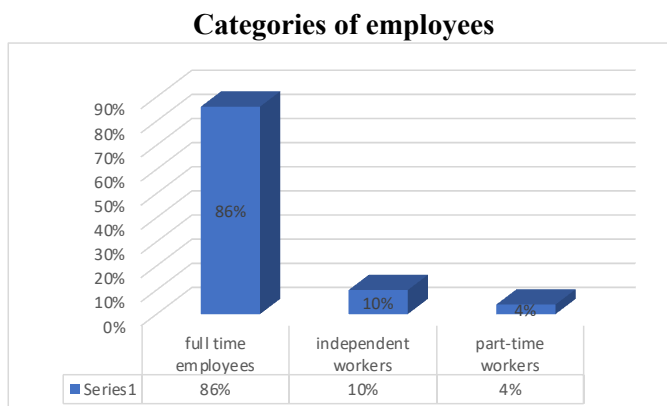
Figure 2.



Source: https://www.ipma.world/assets/IPMA_PwC_AI_Impact_in_PM_-_the_Survey_Report.pdf

About 86% of the responses were provided by full-time employees, while 10% are self-employed and only 4% work part-time.

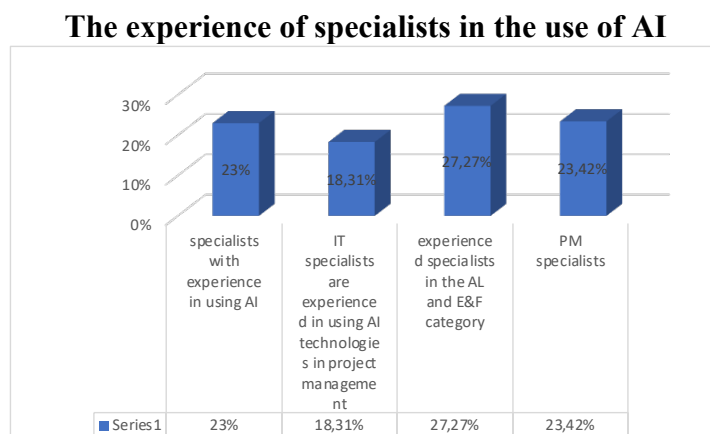
Figure 3.



Source: https://www.ipma.world/assets/IPMA_PwC_AI_Impact_in_PM_-_the_Survey_Report.pdf

Most organizations are at an advanced stage of preparation to take advantage of artificial intelligence's huge potential in streamlining operations. However, only 23% of respondents have experience using AI, and its adoption still appears to be at an early stage. In more detail, only 18.31% of IT professionals said they have experience using AI technologies in project management, compared to 27.27% in the AL and E&F category and 23.42% of PM professionals.

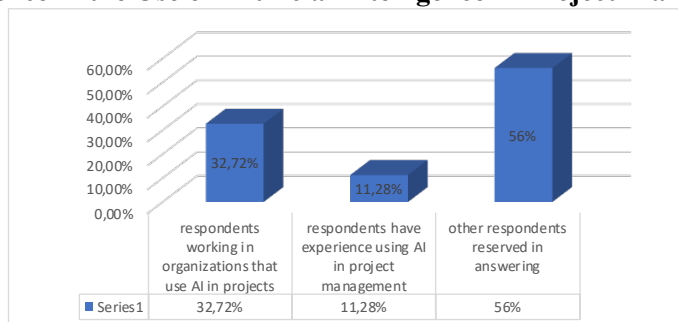
Figure 4.



Source: https://www.ipma.world/assets/IPMA_PwC_AI_Impact_in_PM_-_the_Survey_Report.pdf

Only 32.72% of respondents working in organizations that use AI in projects and 11.28% of those working in companies that do not use AI in projects said they have experience using AI in project management.

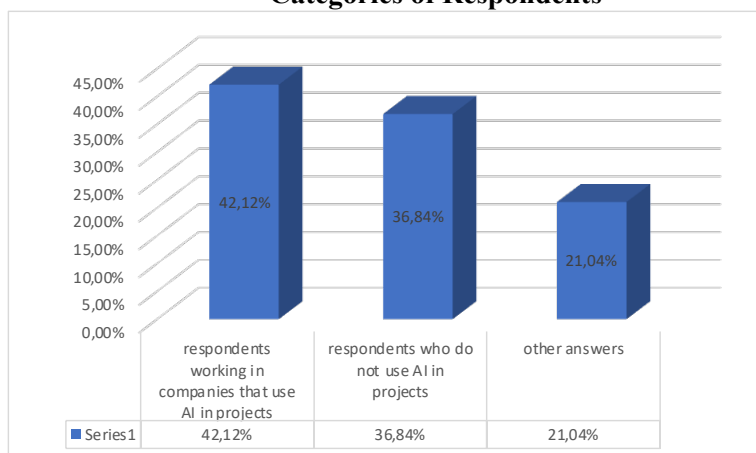
Figure 5.

Experience in the Use of Artificial Intelligence in Project Management

Source: https://www.ipma.world/assets/IPMA_PwC_AI_Impact_in_PM_-_the_Survey_Report.pdf

An interesting aspect was the finding that there are no significant differences in the degree of preparedness declared between respondents working in companies that use AI in projects (42.12%) and those that do not use AI in projects (36.84%).

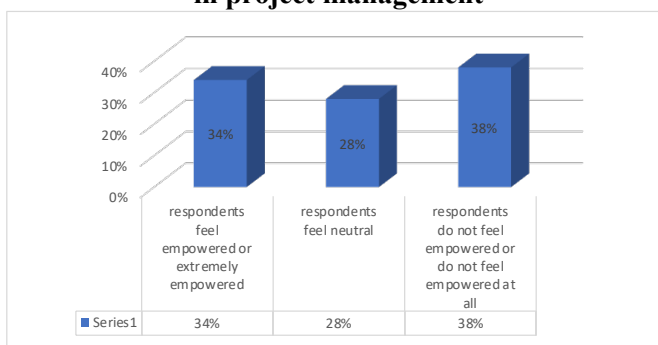
Figure 6.

Categories of Respondents

Source: https://www.ipma.world/assets/IPMA_PwC_AI_Impact_in_PM_-_the_Survey_Report.pdf

AI experience, training, motivation and empowerment According to the survey results, the adoption of artificial intelligence (AI) significantly impacts the perception of "empowerment". Asked about the value of empowerment in driving decisions in implementing AI technologies in project management, respondents provided the following encouraging results: 34% feel empowered or extremely empowered, 28% remain neutral, and 38% do not feel empowered or not they don't feel empowered at all.

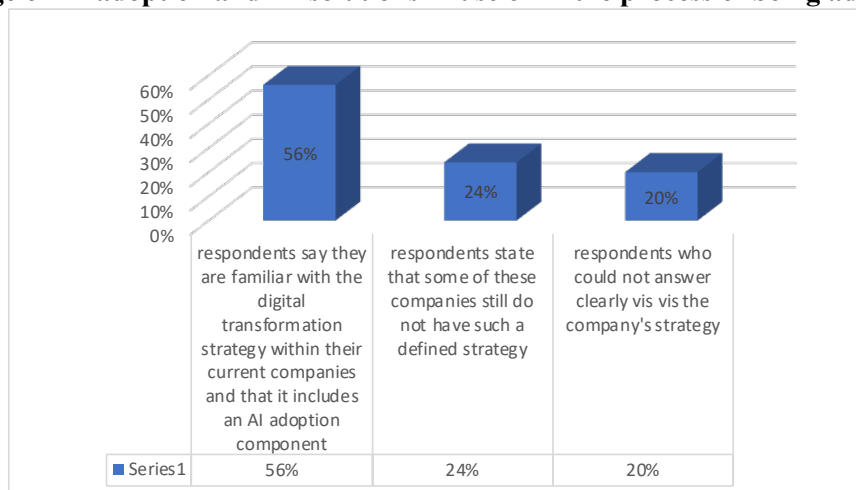
Figure 7.
Categories of respondents regarding empowerment in implementing AI technologies in project management



Source: https://www.ipma.world/assets/IPMA_PwC_AI_Impact_in_PM_-_the_Survey_Report.pdf

A significant percentage of around 56% of respondents say they are familiar with the digital transformation strategy within their current companies and that it includes an AI adoption component. However, despite this fact, 24% of these companies still do not have such a defined strategy.

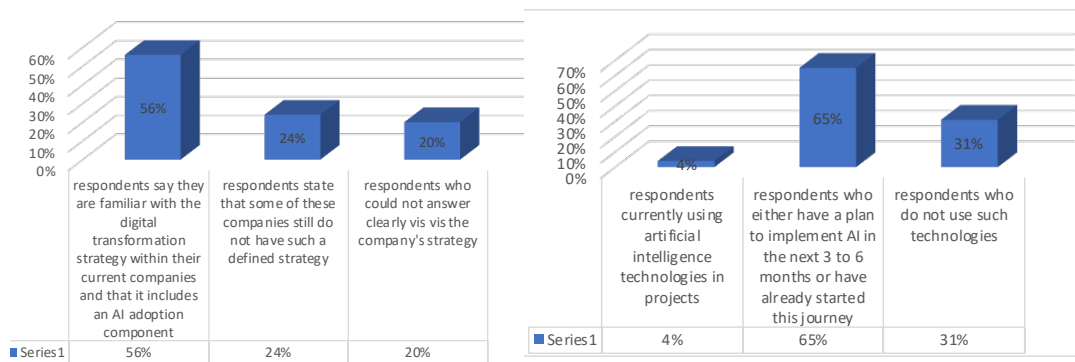
Figure 8.
Stage of AI adoption and AI solutions in use or in the process of being adopted



Source: https://www.ipma.world/assets/IPMA_PwC_AI_Impact_in_PM_-_the_Survey_Report.pdf

Regarding AI technologies used in projects, even though only 4% are currently using such technologies at scale, about 65% either have a plan to implement AI in the next 3 to 6 months or have already started this journey. Three main types of solutions are mainly tested or used in equal proportions: predictive analytics tools, chatbots (digital assistants) and robotic process automation (RPA).

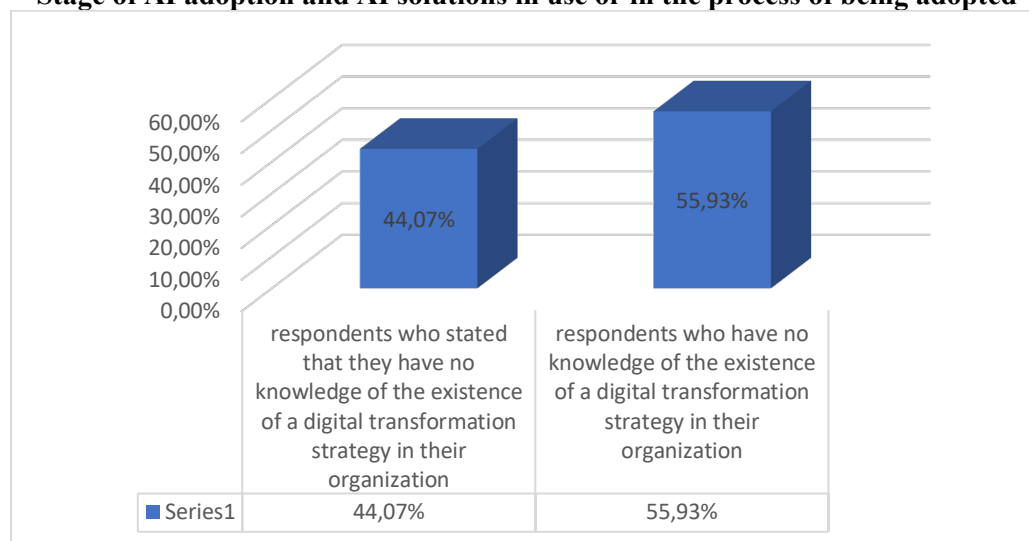
Figure 9.

Stage of AI adoption and AI solutions in use or in the process of being adopted

Source: https://www.ipma.world/assets/IPMA_PwC_AI_Impact_in_PM_-_the_Survey_Report.pdf

Almost half of the participants (44.07%) stated that they had no knowledge of the existence of a digital transformation strategy in their organization and also indicated that they had no information regarding the use or non-use of AI within the organization.

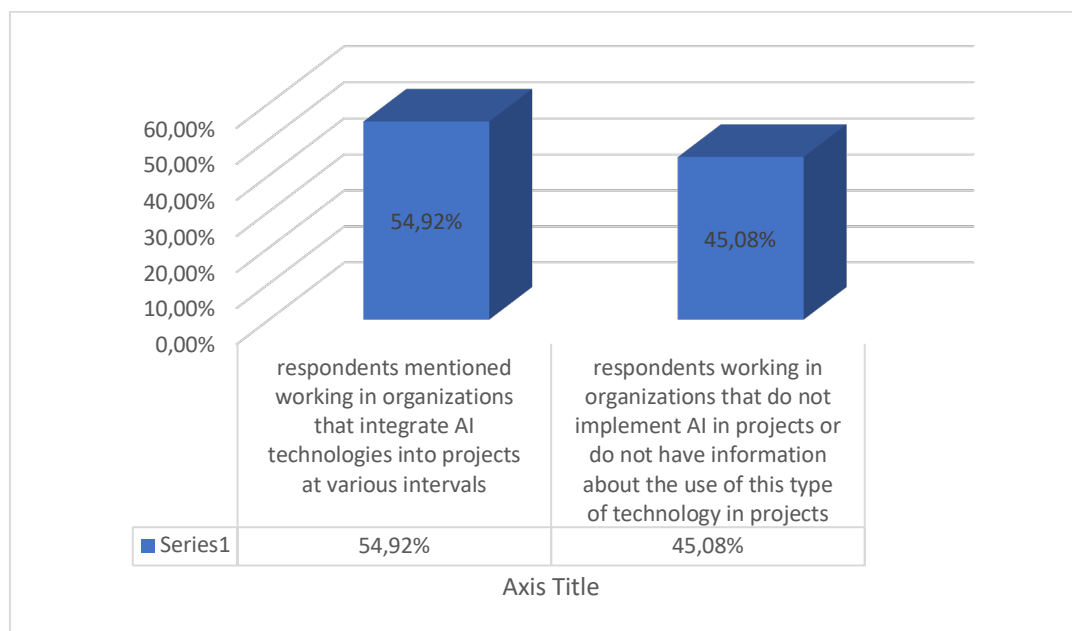
Figure 10.

Stage of AI adoption and AI solutions in use or in the process of being adopted

Source: https://www.ipma.world/assets/IPMA_PwC_AI_Impact_in_PM_-_the_Survey_Report.pdf

Overall, 54.92% of respondents reported working in organizations that integrate AI technologies into projects at various intervals (generally a sign of satisfactory progress in AI adoption). In contrast, 45.08% of respondents work in organizations that do not implement AI in projects or have no information about the use of this type of technology in projects.

Figure 11.
Stage of AI adoption and AI solutions in use or in the process of being adopted



Source: https://www.ipma.world/assets/IPMA_PwC_AI_Impact_in_PM_-_the_Survey_Report.pdf

Conclusions

The use of AI tools opens up new horizons for managing organizations. They facilitate the processes of planning and organizing work, as well as monitoring employees. Their predictive skills help managers make informed decisions and anticipate future situations. Like other professional fields, AI increases the efficiency of managers by delegating routine tasks to machines. As a result, managers can focus more time and energy on higher value-added activities such as innovation, communicating with teams and providing personalized support to employees. However, AI also comes with challenges, particularly due to the rapid pace of change and potential biases related to the design of the algorithms and databases used by the systems, which can affect the credibility of the results. Responsible use of these tools is essential and must respect ethical standards and employee privacy.

With all its advantages and disadvantages, AI is a support tool for managers, but it does not completely replace them. To make the most of the benefits of AI, managers need to develop complementary skills. They need to redefine their role as leaders within the organization and focus on the social and relational dimension of their work. Thus, managers must find new ways to exercise leadership and manage teams. In addition to technical skills, emotional intelligence and communication and listening skills are becoming essential for managers. They need to help employees adapt to digital transformation and learn how to work effectively with AI tools. Schools preparing future generations of managers must constantly revise their curricula to include the learning needed to adapt to AI-assisted and

AI-based tasks. This learning is not limited to the development of managerial and technical skills.

The new challenges of the management profession require professionals to acquire the necessary tools and competences to change their way of thinking, to continuously adapt and to show creativity and relational skills. These skills are crucial to being able to manage teams in a respectful, humane and ethical way, despite the increasing influence of AI technology in the work environment.

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