

# The Impact of Artificial Intelligence on Project Management

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## Abstract

Businesses and the structure of innovation management are being transformed by artificial intelligence (AI). With regard to the rapid advancement of technology and the replacement of traditional human functions, artificial intelligence (AI) can lead management to reevaluate an organization's entire plan for innovation. The ramifications for innovation management in the future are reviewed and examined in accordance. Numerous sectors use project management, and it is not exempt from the advancements that the use of AI keeps bringing about globally. Nevertheless, AI is not yet widely used in businesses, particularly not in all project management domains. Although the exact causes are unknown, they appear to be connected to the unpredictability of using the use of AI in project management (PM). This paper's goal was to recognize the potential and constraints of AI in the particular field of project management through a thorough literature review that allowed for the analysis and correlation of the chosen articles and the discovery of some trends and patterns. A web-based survey and meets with professionals in the field were done to find out how AI might affect the project management industry in the future. In the end, it was clear that, despite certain unexplored areas, the academic community is growing more and more curious in this field.

**Keyword:** Artificial Intelligent, project management, project manager, innovation, technology, industry, PM techniques.

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## 1. INTRODUCTION

### 1.1. Background

Technology is being used in various sectors to boost productivity and efficiency while allowing for dependable, secure, and consistent management. Everyone has helped ensure continuous progress by contributing to the improved performance and motivated culture that resulted from the fusion of human capabilities and technical systems (Mahmood, *et al.*, 2023). PM is another field where integrating technology and human skills has proven beneficial (El Khatib & Al Falasi, 2021). Three elements set project management apart, and they are as listed below:

- The existence of capable and influential project managers.
- Creating an environment that inspires project managers to complete their tasks.
- Ensuring that each employee in the business is held responsible.

AI is expanding the capabilities of humans. The study examined the benefits of integrating AI into PM and how it can increase PM effectiveness. It also

explored the significance that AI plays in PM, including its potential use.

To help them handle a range of tasks, project managers can use a number of AI-driven tools (Lahmann, *et al.*, 2018). For instance, they helped the management assemble the project team and assign responsibilities and duties to each individual on the group (BUTT, 2018).

Using AI technology also has the benefit of assisting project managers in efficiently tracking and completing tasks on time. There are several benefits for project managers when they apply AI. To start, project managers benefit from AI as machines reduce workloads and alleviate some of the stress that comes with PM. Due to the lack of human participation, AI-assisted projects do not involve errors, which is another advantage in providing project managers with accurate outcomes (Lozano-Pérez & Kaelbling, 2002).

The application of AI also helps project managers create plans and get new insights. For example,

AI-powered software recommends additional or different processes for project managers engaged in difficult projects. It not only helped project managers complete the tasks listed above, but it also increased their productivity by improving their efficacy and efficiency. This is achieved by increasing the managers' emotional intelligence and nurturing their ability to create (Abduh & Soemardi, 2002).

The 4th generation of industrialization is causing major alterations in human civilization. These alterations are a result of technological advancements. The first industrial era was marked by the invention of coal-fueled steamers, while the second was emphasized by the widespread use of electricity and mechanization. Digitization, which was intimately linked to the development of the internet, then gave rise to the third industrial revolution. (Rüßmann, *et al.*, 2015) state that developments in technology, machine learning, virtual reality, large-scale analytics, and the internet of things are among the crucial elements that are being fostered and evolved into Industry 4.0. Autonomous driving vehicles and robots that can imitate how people act in the real world have already undergone successful testing in this new era. The continuous digital transformation is making human-machine interaction inside enterprises an inevitable part of the future (Brettel, *et al.*, 2014).

As a result, the expectations for the future workforce have rapidly changed in response to the actual possibility that on some tasks, people and machines are able to collaborate. Businesses must reconsider their operations to remain effective in a market that is often upended by the arrival of new products and services. (Albach, *et al.*, 2016) claim that late entries struggle to maintain up with the quick speed of technological advances and that managers must adjust their companies to a continually changing environment. Exploring the possibilities of incorporating innovative techniques, including those resulting from artificial intelligence, into standard corporate procedures is essential for continuing to be at the forefront. This artificial intelligence is the key to succeeding.

### 1.2. Purpose of the Project

The technology industry's explosive growth and the noteworthy developments in PM served as the primary driving forces behind this study. Project managers must do their work as successfully and effectively as possible since it is so important. Numerous technological developments have been made particularly to help project managers in this regard because of advancements in technology. (Vesma, 2009). Therefore, the goal of this study was to find out how AI helps managers.

### 1.3. Significance of the Project

Artificial intelligence is used by the majority of businesses today, including crisis dashboards, which are one of those tools. Figure 1 illustrates the proportion of

AI programs in use within businesses. AI allows for the creation of predictions as well as the presentation of possibilities that increase the utility of past decisions. The study found that employing different AI tools with additional data led to better decision results (Kamilu, *et al.*, 2025). Executives may find it challenging to arrange or determine the amount of work that has to be done in the absence of labor constraints. The majority of the time, extra work is finished on schedule regardless of AI, talent needs, budget constraints, or technological limitations (El Khatib & Al Falasi, 2021).

### 1.4. Research Questions

**Q1:** What are the biggest obstacles that the project staff must overcome in order to complete the project?

**Q2:** Do members of the project team utilize AI-based solutions for project management?

**Q3:** Do members of the project team think machines with AI will be useful for their day-to-day tasks?

## 2. REVIEW OF LITERATURE

### 2.1. Project Management (PM) Overview

PM in business expansion might involve planning the process for growth and identifying the tools needed to ensure the new division's fulfillment. In construction, PM may include overseeing a group of contractors, technicians, and architects to guarantee a building project is finished on time and within the price range. The observation further highlights that PM is applicable to every project that has to meet a certain set of goals and is not restricted to just one kind of project. This covers projects of all sizes, and both may benefit from the use of PM concepts. Organizations may guarantee the accomplishment of their goals and the effective completion of projects through the use of PM principles and techniques (Project Management Institute, 2024).

### 2.2. Project management characteristics for deciding

According to (Yip, 2017), the four main factors of utmost relevance in PM are cost, duration, performance, and scope, and they are the most important components from the start of the project's preparation. The timeline for the project is one of the most crucial elements. Appropriate budget allocation and financing phase-in are necessary to guarantee sufficient funds for all project needs. The financial components of the project should be well understood by the project manager. This entails determining the project's main financial source, which may originate from external money, internal budgeting, or a mix of the two. The project manager can make the right resource allocation and guarantee that the project stays under budget by knowing where the money is coming from.

Any project's planning phases determine its scope, which is crucial for controlling stakeholders' and the requirements of customers. Any project with a clearly defined scope will be less likely to have its needs changed often. Analyzing what should be permitted in a

project and what must be carried out will be made easier by the project's unsatisfactory results, budget overruns, and failure to be finished within the allotted time and scope. (Bukłaha, 2018). Throughout the project's lifespan, scope management aids in the establishment of control factors that can handle aspects that lead to modifications. The scope of work is among the most crucial elements of PM. The range of a project refers to the specific tasks, outputs, and objectives that must be completed as part of it. Without a solid understanding of the nature of the task, project managers may be unable to estimate the amount of time and money required to complete it.

### 2.3. Technology's Significance in Project Management

Not every issue pertaining to a project can be resolved by a project manager; technology and creative approaches will greatly assist in resolving the majority of issues. Because of the scale and complexity of the projects being worked on, technology is a need. New technological opportunities will raise standards among customers and top executives, and with the right use of technology, results might be achieved faster than in the past. (Odeh, 2023). Since communication is the most important component of project achievement, project managers usually emphasize it. Technology accelerates up finishing a task. by enabling project personnel to organize all of their activities and share ideas with individuals (Team AdaptiveWork, 2019). (Williams, 2005) asserts that businesses are becoming increasingly plan-focused and that annual project budgeting has been rising, hitting billions of dollars globally. Its first aim is to identify pertinent factors that might impact the outcome of a project. PM and data preservation are two areas where information technology is essential. A study found that humans convert data into knowledge far slower than technology systems (Williams, 2005). Big businesses throughout the world have been spending money on cutting-edge technologies that can boost how efficient and competitive they are. We can draw the conclusion that technology enhances corporate results. In order to support the company's activities and enhance corporate performance, technology must be employed strategically in organizational domains. (Prieto & Revilla, 2005). The effectiveness of technology design also affects how it is used in projects. The demands of each project should constantly be taken into account while developing new technical systems (Anantatmula & Kanungo, 2005).

### 2.4. AI in Project Management

According to (El Khatib & Al Falasi, 2021), A structure that can help with project-focused activities with limited human input is what AI in PM might be thought of as. The way businesses manage projects has been completely transformed by AI.

Technology and humans work together constantly when AI is used in management. AI has

already been adopted by managers in important organizational sectors. HR, advertising, customer service, and product development are some of these areas. Recent years have seen a great deal of discussion on the nature and scope of the fourth industrial evolution, which deals with the fast developments in technology. The advantages and disadvantages of the technology are assessed and considered in relation to how it may be controlled for the good of companies and society, as well as what the next years will bring. Research has been done on the AI techniques and technologies that can be utilized to automate corporate PM duties (Lahmann, *et al.*, 2018). Only a limited number of a project manager's responsibilities can currently be mechanized. The employment of machines in the workplace will need managers at all stages to adjust in the future. AI will probably end up being more affordable and effective than humans at some tasks (Pan, 2016).

That does not imply, however, that management will be entirely replaced by robots. Rather, managers may use their precious time on things that only people can do. Applying knowledge and experience to important business choices is one of these responsibilities. The goal of AI is to assist managers, not to take their position. Time management and preparation are essential components for every project to have a good end. The first strategy emphasizes decision models and network-based methods (Brettel, *et al.*, 2014). The second approach focuses on AI-based techniques. The results indicate that AI is expected to have a big impact on project management and might be a helpful tool for project planning. The primary benefit of AI-based approaches is their ability to distinguish between the information and the mechanism utilized to analyze the material. This gives them greater flexibility than network-based approaches as it enables information to be supplied regardless of the project-solving technique used by the system (Albach, *et al.*, 2016). While network-based approaches do not take task uncertainty into account, these methods can manage it when determining the links between different tasks in the project planning.

AI may enhance workplace behavior and promote success throughout the company by automating some processes, centralizing knowledge, and enhancing accuracy and uniformity (El Khatib & Al Falasi, 2021).

Information-driven choices was investigated by (Miser & Sarioguz, 2024) as a means of enhancing the efficiency of software development. Based on survey data on project managers' opinions about staff efficiency, product reliability, and user happiness, the author compiled global project failure probabilities. The outcome showed that between 24 and 36 percent of software projects failed to keep up with hardware updates. Software managers' understanding of information-driven choices in agile software development initiatives is lacking. The primary concentration of (Miser & Sarioguz, 2024)'s study is on

how software managers may increase productivity through information-driven decision-making. The three key components of software business efficiency improvement—people, operations, and tools—were the main focus of the study. According to the author, constructive change may result in a deeper comprehension of data-driven decision-making in agile settings, which can assist businesses in producing more goods, adding more employees, and improving their ability to compete in the global market.

There may be some ethical issues with using AI in PM. Research on initiatives that had a suitable scope was done for the paper by (Prieto, 2019). When employing AI to forecast project projections and effectiveness, some algorithms have been assigned where clarity and ways to verify are crucial. However, (Prieto, 2019) notes that although a lot of work has been done to integrate AI into PM, much of it has concentrated on predicting outcomes rather than comprehending how PM is evolving inside an AI system. According to the author, AI is transforming the function of the project manager, and a deeper comprehension of how PM solutions may adjust to these developments is necessary.

## 2.5. AI's Significance for Project Management

Each person wants to be successful and direct safely and effectively, and PM is no different, claims (Joubert, 2023). When human abilities are combined with technical systems, innovative structures are created, that involve all stakeholders in continuous improvement. Creating a strong and competent project manager and ensuring responsibility are the three elements of PM. AI greatly enhances PM efficacy. (Joubert, 2023). (Belharet, *et al.*, 2020) Research elucidates the connection between intelligent technology and PM. A relevant project manager should be prepared for learning additional competencies that will help them manage and improve AI capabilities. By 2030, there will be a significant increase in managerial roles and product development, and innovative devices and machinery will account for the bulk of PM work. This research showed that in the upcoming ten years, there would be a significant digital change that will benefit IT workers (Belharet, *et al.*, 2020).

Project manager's demands about AI were revealed via research done in 2022. fifty-two PM specialists participated in Delphi research to consider the potential uses of AI in the future. The findings show that PM techniques may be much enhanced and that all of the innovative viewpoints can soon be converted into workable solutions (Holzmann, *et al.*, 2022). We can learn more about how AI and humans work together to make decisions on projects from the following research. An ideal partnership enables AI to advance at a remarkable rate. More information can be processed and used effectively using AI. The process of deciding considers a variety of information kinds. One kind of information that has been expanding quickly lately is big

data. (Vedamuthu, 2020) talks on how AI technologies may be used to process large amounts of data that are difficult for people to handle efficiently. The researcher notes that ML and other AI systems can sort through enormous amounts of data, collect information, and identify trends to help businesses make more accurate choices. It is crucial to remember that machine learning is limited to processing codified and measurable data; as a result, it might not be able to analyze unstructured data, such text or photos.

## 3. RESEARCH METHODOLOGY

Challenging events that are hard to quantify, including the impact on society and culture of AI and the challenges of PM, can be effectively studied using qualitative approach. Because there hasn't been much research done on integrating AI, computer science, and PM, an exploratory approach was used to offer a viewpoint for this study. Employing the qualitative research methodology, this gap in literature is addressed. The study underlined how crucial reflexivity is to the entire research process since preconceptions and prejudices may affect how the evidence is interpreted.

Material from project managers employed by different companies was analyzed using questionnaires in order to conduct this study. Identifying the issues that project managers deal with on an everyday basis, assessing the degree of awareness and application of AI, if any, and creating use cases for the possible incorporation of AI systems into PM stages are all included in the scope. Additionally, this research has been limited to the subjective information provided by project managers on the workplace in which they were working at the duration of the study. All names of people, groups, or other discussions attendees were eliminated, and the data was deidentified.

### 3.1. Qualitative Research Approach

Among the techniques employed in qualitative research include analysis, survey methods, and interviews. In an informal discussion, the interviewer may ask open-ended questions on a topic and modify their approach according to the interviewee's responses. In a formal interview, a predetermined number of questions are presented to each participant. It is frequently intimate and appropriate for sensitive topics or ones that need for in-depth research. Target circles, which are usually held with eight to twelve target members, are used when cooperation and viewpoints on a topic are required (Fridgeirsson, *et al.*, 2023). Based on the objectives and structure of the research, qualitative methods may provide a significant amount of data, such as at a central place or in the respondents' surroundings, whereas quantitative research design dictates a controlled setting for data collecting.

Many times, a study subject is the first step in qualitative research. By qualitative research, the study hypothesis will be established and examined through



quantitative methods. In order to better comprehend the results and full significance of the statistics, a number of qualitative approaches may be used to further investigate the data after it has been collected and subjected to quantitative analysis. Qualitative methods may then be used to develop the hypothesis for more research and make the quantitative data easier to interpret. Additionally, academics could apply qualitative research to study understudied issues utilizing quantitative approaches. These comprise of social science investigations, personal actions, and perspectives (Bento, *et al.*, 2022).

According to (Fridgeirsson, *et al.*, 2023), an excellent qualitative research design starts with a goal or aim. This has to be clearly stated or clarified. The target population must be specified. A procedure for collecting data from the study population needs to be carefully outlined in order to ensure that no portion of the target group is overlooked. A suitable collecting approach should be established that will help get the necessary information without unreasonably constraining the obtained data, as the requested information is often not efficiently classified or gathered. Finally, the design should ensure that there are enough methods for analyzing the data. With the help of an example, some of the numerous aspects of qualitative research might be better understood.

### 3.2. Reliability

According to (Bryman, 2016), This concept relates to the consistency of a study's structure, which is often associated with the question of whether or not research findings can be replicated. Durability is one of the most important considerations when evaluating a measurement's dependability. There should be little to no difference in the outcomes if the same study approach is applied to the same group again because the same procedure is employed both times (Bryman, 2016). These elements are nearly universally regarded as possible quality indicators for quantitative research approaches. The responses gathered over a two-month period comprised the findings of the online interviews conducted for this study. It is reasonable to draw the conclusion that this measure is reliable because participants were not provided with any new information about the research during this period.

### 3.3. Methods of Sampling and Collecting Data Materials and Participants

Mathematical data and statistical methods are rarely used in this kind of study. In accordance with the number of subjects or circumstances studied, it is often small-scale (Guest, *et al.*, 2006). The future of the subject under study is then forecast using the findings (Palinkas, *et al.*, 2016). When all measurements are made simultaneously or during a brief period of time, the research can be considered to be divided. Interviews are the primary means of gathering data for this study. preset statements were given in a preset order during informal

interviews. Additionally, the statements had pre-established response alternatives that indicated the statement's level of effect. Depending on how the interview went and as response to the participant's comments, spontaneous questions were also employed. A Microsoft Forms-based online survey was incorporated.

The research employed an intentionally chosen sample, selecting the most suitable participants for the interviews. To ensure that participants had the necessary knowledge to answer and comprehend the questions, an informal group was selected. The professionals in the sample were selected according to their industry and areas of expertise. They have to have PM expertise. The responders' expertise in information technology or AI, as well as their background in PM for software, is another crucial component. For the research to yield meaningful findings, the sample of professionals must possess strong expertise in both areas of investigation.

### Ethical Considerations

Many ethical issues were given significant deliberation and taken into consideration when performing this investigation. All participants were reassured that their answers would be kept confidential previous to the online interviews. This suggested that their viewpoints will be expressed in a broad sense, unconnected to their own experiences or companies. Before the results were provided, any private data was anonymized, with the exception of the participant's credentials and work experience, which were utilized for relative terms. All respondents were made aware of the procedure before the interviews began, which included recording the talks for the sole purpose of transcribing the interviews in order to guarantee the correctness of the data before it was analyzed. The interviewees were also given the assurance that the interview would only be used for educational and research reasons.

## 4. DATA ANALYSIS, AND DISCUSSION

After finding commonalities among the participant's answers to each questionnaire, the researcher categorized each response under the appropriate question. Both inside and between each group, the replies were examined. Prior to carrying out an integrated analysis, researcher began the familiarity procedure via examining the outcomes from each group independently. The three research questions were based on the benefits and challenges of using AI in PM in the computer science sector. The replies from the participants were used to answer these questions.

### 4.1. Research Question One

**What are the biggest obstacles that the project staff must overcome in order to complete the project?**

This study illuminates the nuances and complexity of this technological revolution by examining the difficulties project teams have when integrating AI technologies into their work. Awareness,

modifications, interactions, record-keeping, boundary creep, and time are among the issues noted. Among these problems, communication appears as the most crucial, demonstrating the multidimensional character of AI application.

#### 4.2. Research Question Two

##### **Do members of the project team utilize AI-based solutions for project management?**

Nearly half of the 15 survey participants claimed to know nothing about AI systems. Sixty-five percent of those people also stated that they did not use any AI systems in their study. To put this startling discovery in a bigger context, several of the project managers who responded to the poll said it pushed them to move far out of their familiar areas. Numerous project managers have put into perspective this intriguing finding. These findings demonstrate the respondents' ignorance of or inability to understand AI technology. The real usage of AI structures is already common in their lives, but usually restricted to the application of ANIs, whilst the purported use of AI systems is usually restricted in their imaginations to the development of self-driving automobiles. In general, this finding implies that the project managers who participated in the research could be undervaluing the value of AI systems and not realizing their entire potential and potential uses.

#### 4.3. Research Question Three

##### **Do members of the project team think machines with AI will be useful for their day-to-day tasks?**

Seventy-five percent of respondents said they had no idea whether their firm had a business plan for employing AI systems, and 45 percent said they had no idea if their company used AI systems at all. According to the findings, more work is required to refocus businesses and train employees in order to adapt to the digital era. In order to detect and resolve any possible problems that might arise from the use of AI systems, Collaboration between AI experts and project managers will be essential.

The results of the investigation agreed with the literature review's conclusions. Project managers may benefit from AI systems in a number of ways, such as immediate information analysis, threat detection, and action recommendations based on knowledge gained from data. AI systems may also be able to automate repetitive operations, freeing up project managers' time for thinking strategically (Prieto & Revilla, 2005).

## 5. CONCLUSIONS AND RECOMMENDATIONS

AI therefore appears to have the ability to lower the financial risk that is frequently connected to more conventional approaches. When it comes to situations that need interpersonal relationships amongst individuals working on a project, AI is absolutely essential. This is due to the fact that even while a project may appear to be viable from the outside, if team members are unable to collaborate, it could fail miserably in practice.

AI-based technologies have made it feasible for project managers to streamline their work in previously unattainable ways.

This study revealed that the sector of PM has only undergone 50% digitization. Being beneficial is more difficult because of this factor.

#### 5.1. Limitations of the Study

The research focused on the impact of AI on the branch of PM, but discussions in the industry about the capacity for computation needed for sophisticated machine learning and its long-term advantages are ongoing, and the research's results may become irrelevant over time due to AI's rapid growth.

#### 5.2. Implications for Future Study

Several problems were discovered throughout this investigation. Further research in this area is urged in light of the difficulties this analysis uncovered. The findings point to the necessity of more academic study on AI applications like PM. The prevalent belief that employing AI or other technologies will assist many present occupations in the near future has led to the selection of this topic as one that requires more investigation.

Furthermore, the research failed to take into account the different managerial levels' interests while developing and implementing AI-based solutions for certain business processes. Another advice resulting from this is to do research that considers both the downward and upward managerial techniques currently in use within a particular organization in order to examine the feasibility of implementing such advances in the workplace.

#### 5.3. Recommendations for Current and Future Studies

- The main recommendation for further study is to look into AI-based approaches for specific tasks from a scientific perspective.
- Establishing a system based on AI for certain activities, as those found in PM in this study, is a second suggestion in this regard. The study suggests that something be done in this respect.
- Research on the potential deployment of AI-based technology and any risks or obstacles should be conducted within a corporation utilizing both downward and upward approaches.

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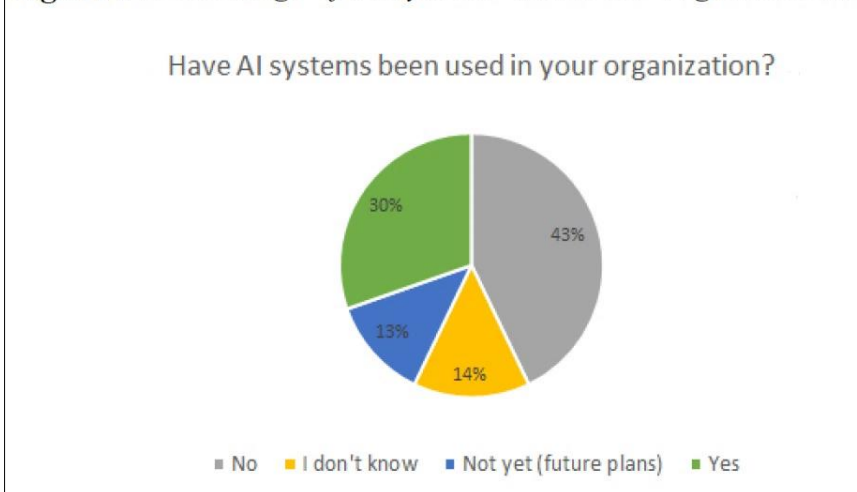
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## Appendices

**Figure 1 . Percentage of AI Systems within the Organizations**



1. What is your highest level of education ?
2. What is your current position?
3. Please state roles and responsibilities in your current role ?
4. Total years of experience working in project management?
5. Please explain the type of firm's business you currently work in ?
6. What is your Company's vision in the next five years?
7. Describe your level of knowledge of AI and PM concepts?
8. When managing the Project, do you make use of any AI-based tools?
  - Yes
  - No
  - Not Sure
9. What are current processes you follow to manage a project?
10. Do you believe that AI agents will be effective for the activities you do daily?
  - Yes
  - No
  - Not Sure
11. What are the areas you believe AI might give more effective assistance for project management
12. What are the most significant challenges that you or members of the project team face while working on the Project ?

## Survey questions



**About the Individual and Background**

1. What is your highest level of education?
2. What is your current position?
3. Please state roles and responsibilities in your current role.
4. Total years of experience working in project management?

**Company Background**

1. Please explain the type of firm's business you currently work in.
2. Company's vision in the next five years?

**Project Management Questions**

1. Describe your level of knowledge of AI and PM concepts.
2. When managing the Project, do you make use of any AI-based tools?
3. What are the current processes you follow to manage a project?
4. Do you believe that AI agents will be effective for the activities they do daily?
5. What are the areas you believe AI might give more effective assistance for project management?
6. What are the most significant challenges that you or members of the Project Team face while working on the Project?

**Interview questions**