



Artificial Intelligence in IT-project Management

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Abstract
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AI is one which can bring value for IT project management and IT industry. AI can be a powerful tool for managing IT projects and bring value to IT industry. Beyond the common focus on improving project documentation and automating routine tasks, the real benefits emerge when we integrate project data with AI.

AI-driven decisions can lead to better project planning, risk assessment, and resource utilization. Emerging Roles in IT Project Management as AI adoption continues to grow, new roles will emerge in IT project management. Skilled professionals will play a critical role in analysing project data using various AI tools, ensuring that organizations maximize the benefits of AI.

The aim of this research was to map out the status of AI in IT project Management. And give some indicates how the use of artificial intelligence in IT project Management will evolve. The research will also give an insight on what value artificial intelligence brings to IT –project management.

This thesis is based on qualitative research with some quantitative background question, research questions and interviews with people involved in the role of project manager. The data were collecting by sending themed interview questions before interview and we are going through the answers with interviewees and make a note about interview.

The results of the research were predictable - artificial intelligence is new to Finnish IT consulting companies and only a few really knows what it is and how to use it. Project managers need new skills to better understand the technology and how to use it at work. Rather than just streamlining administrative work, AI can provide valuable insights by analysing project-related data. Quality project management data is important: To get fully benefit from AI, we need to pay attention to the quality of project management data. Accurate, comprehensive data ensures that AI-driven decisions are reliable and impactful. High-quality data enables AI algorithms to make informed recommendations, optimise resource allocation and improve project outcomes. AI's untapped potential - Beyond automating repetitive tasks, AI's untapped potential lies in its ability to analyse data. In doing so, it can provide actionable insights that human managers may miss.

Further research is needed to see what we can do to get more qualified project data and find a solution to improve IT project management using AI.

Keywords IT -Project Management, Project manager's skills, Data Management, Artificial Intelligence.

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Tekoäly on yksi tämän hetken ilmiöistä mikä voi tuoda hyötyä IT-projektien johtamiseen ja koko IT-toimialalle. Tekoälyn yleisimmät hyödyntämisen kohteet ovat tällä hetkellä projektihallinnan rutiinityöt esimerkiksi muistioiden kirjoittaminen. Todellinen hyöty tekoälystä saadaan, kun yhdistetään tekoälyn työkalut ja laadukas projekti data.

Projektidatan ja tekoälyn avulla projektipäällikkö voi saada tehtyä tehokkaampia päätöksiä millä voidaan auttaa projektien suunnittelua, riskien arviointia sekä resurssien optimointia. Uudenlaista osaamista tarvitaan IT-projektipäällikön työssä, yksi tärkeimmistä tulee olemaan tekoälyn hyödyntäminen. Tulevaisuudessa IT-projektipäällikkö tarvitsee uudenlaista osaamista kuten projekti datan analysointi osaamista erilaisten tekoäly työkalujen avulla.

Tutkimuksen tavoitteena oli selvittää tilannekuvaa tekoälyn käytöstä IT-projektien johtamisessa sekä tarkastella miten tekoälyn käyttöä voi kehittää yrityksessä sekä selvitettiin myös mitä lisäarvoa tekoäly voisi tuoda IT-projektien johtamiseen.

Tutkimus tehtiin kvalitatiivisena tutkimuksena sisältäen myös kvantitatiivisia taustakysymyksiä. Tutkimus tehtiin haastattelu tutkimuksena, kysymykset teema haastatteluun lähetettiin haastateltaville etukäteen. Kaikki haastateltavat henkilöt olivat toimineet pitkään IT-projektien johtotehtävissä. Haastatteluista tehtiin muistiinpanot ja ne nauhoitettiin analysointia varten.

Tutkimustulokset olivat osittain ennalta-arvattavia: Tekoäly on vielä uutta suomalaisille IT – konsultointiyrityksille, tutkimuksen osallistuneista vain harva osasi kuvata tekoälyä ja mitä sillä voi tehdä. Projektipäälliköt tarvitsevat tekoäly teknologian ymmärtämystä ja kuinka käyttää tekoälyä työssä: Tekoäly voi auttaa projektipäällikköä analysoimalla projektidataa ja hyödyntämällä algorytmejä, siksi laadukas projektidata on tärkeää. Tekoälyn avulla voidaan saada projektien tilanteesta parempi kuva, tekoäly voi myös ehdottaa korjausehdotuksia perustuen dataan, sellaisiinkin mitä ihminen ei työssään huomaa. Tulevaisuuden tekoälyn tutkimuksen kohteina ovat kuinka saamme kerättyä laadukasta projekti dataa ja miten hyödynnämme tekoälyä IT-projektien johtamisessa.

Avainsanat IT-projektin johtaminen, Projektipäällikko, Tietojohtaminen, tekoäly
Sivut 44 sivua ja liitteitä 2 sivua

Terminology

AI = artificial Intelligence, Artificial intelligence (AI) refers to computer systems capable of performing complex tasks that historically only a human could do, such as reasoning, making decisions, or solving problems

ML= Machine learning Machine learning (ML) is a branch of artificial intelligence (AI) and computer science that focuses on the using data and algorithms to enable AI to imitate the way that humans learn, gradually improving its accuracy.

NLP= Natural language processing (NLP) is a machine learning technology that gives computers the ability to interpret, manipulate, and comprehend human language.

PM= Project manager, A project manager is a professional in the field of project management. Project managers have the responsibility of the planning, procurement, and execution of a project, in any undertaking that has a defined scope, defined start and a defined finish, regardless of industry.

PMO= A project management office is a group or department within a business, government agency, or enterprise that defines and maintains standards for project management within the organization.

Agile = Agile management is the application of the principles of Agile software development and Lean Management to various management processes, particularly product development

CHATGPT= ChatGPT is a chatbot and virtual assistant developed by OpenAI and launched on November 30, 2022. Based on large language models, it enables users to refine and steer a conversation towards a desired length, format, style, level of detail, and language

Copilot= Microsoft Copilot is a chatbot developed by Microsoft and launched on February 7, 2023. Based on a large language model, it can cite sources, create poems, and write songs.

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1 Introduction

We are living in an artificial intelligence fever now, and it will offer new possibilities to IT-industry and specially managing IT-projects. AI can be a useful tool for managing IT projects. We can see many inspiring examples of how to use AI to improve project documents and minimise project routine work, but the real benefits come when you can use project data and AI and get real help to manage IT projects better. To reap the benefits of using AI in IT project management, we need to pay attention to the quality of project management data. I believe that in the future we will have new roles in IT project management, and we will need more people to analyse project management data using different AI tools.

AI Challenges and Opportunities - In today's fast-paced business environment, project management is more critical than ever. The success of an organization often hinges on its ability to deliver projects efficiently and effectively. To stay ahead, many companies are turning to Artificial Intelligence (AI) to revolutionize their Project Management Offices (PMOs). (Dacre, N. & Kockum, F, 2022)

The role of AI in IT project management in our AI-driven world, there's immense potential for artificial intelligence (AI) to revolutionise IT project management. While many focus on using AI to improve project documentation and streamline routine tasks, the real benefits come from using project data alongside AI. Here's why quality project management data matters:

The untapped potential of AI: AI can provide real help in managing IT projects, but we need to recognise its untapped potential. As well as automating repetitive tasks, AI can analyse data to provide valuable insights. Data quality matters: To use AI effectively, we need high-quality project management data. Accurate, comprehensive data ensures that AI-driven decisions are reliable and impactful. Future Roles: As AI adoption grows, new roles in IT project management will emerge. These roles will involve analysing project data using various AI tools. Skilled professionals will play a critical role in maximising the benefits of AI.

Background and motivation

No matter how well you manage a project, certain problems that are identified will not go away. Project management has evolved from the old waterfall model to a more agile one, but project model development has not solved the challenges of IT project management.

After discussing the challenges of project management in general with project managers, we still agreed on the challenges of IT project management. One of these is the time constraints imposed on IT projects, and critical tasks are not identified during project planning - we do not collect project data on a regular basis. The data is also poor and not in the same place, which makes it very difficult to use AI to analyse the data.

It seems that very rarely does an IT project stick to the original schedule that was the target. Another interesting issue is how AI will change the work of the project manager and what value it can bring to the IT project manager, what kind of skills and education the future project manager will need. And how can we make sure that we invest in the right technology and the right tools if we don't have the decision at the strategic level of the company? Could we gain a competitive advantage by using AI in IT project management work and what value can it bring?

These challenges are common to all types of IT projects, whether it's implementing a new system, building a new application or fixing a technology problem. I've been thinking a lot about how to solve these problems. AI is worth exploring for these problems. AI is one of the biggest trends in IT right now.

Currently, only 35% of IT projects achieve success, due to the limited maturity of available project management technologies. However, this trend is on the brink of transformation. Why don't we get help from AI in IT- project management? And what kind of help it could be?

2 Theoretical Framework

The primary sources utilized are scholarly articles and research papers, as books specifically addressing AI in project management are scarce. It is crucial to elucidate fundamental IT project management practices while highlighting the potential applications of artificial Intelligence.

The interest in applying AI to drive business is motivated by innovation. However, some barriers for AI implementation are identified as high short-term investment costs, high risk of long-term return on investment (ROI), lack of trust in the technology, lack of AI experience, and fear of the potential of AI to replace jobs for project managers. (Cubric, 2020)

Large IT efforts often cost much more than planned; some can put the whole organization in jeopardy. The companies that defy these odds are the ones that master key dimensions that

align IT and business value. Only 35% of projects today are completed successfully. One reason for this disappointing rate is the low level of maturity of technologies available for project management. This is about to change. Researchers, startups, and innovating organizations are beginning to apply AI, machine learning, and other advanced technologies to project management, and by 2030 the field will undergo major shifts.

Technology will soon improve project selection and prioritization, monitor progress, speed up reporting, and facilitate testing. Project managers, aided by virtual project assistants, will find their roles more focused on coaching and stakeholder management than on administration and manual tasks. The author shows how organizations that want to reap the benefits of project management technologies should begin today by gathering and cleaning project data, preparing their people, and dedicating the resources necessary to drive this transformation. (Nieto-Rodrigue & Viana Vargas, 2023)

Evolution of AI in project management

The future of project management will be heavily influenced by technological breakthroughs, and there is no doubt that AI will change the course of how project management tasks are delivered and controlled in the future. We are convinced that AI will evolve from simple task automation to predictive project analytics, advice, and actions. However, there is something AI cannot do – be human. (Longhurst& Woojin, 2023)

Over the years AI has been associated with different terms ranging from cognitive computing and machine learning to natural language processing. What they all have in common is the idea that machines could one day learn by themselves, rather than having to be spoon-fed every instruction or merely acting in accordance with a pre-programmed rule set. (Lahmann, .2018)

Today the term AI is often used interchangeably with 'automation.' There is, however, a huge difference: automation is a controlled process that follows pre-programmed logic and rules, while AI is designed to simulate intelligent and even human thinking. To date, a lot of the focus has been on the automation – requiring a certain degree of standardisation – of tasks that are already carried out. However, we consider this as only the first phase in the evolution of AI in project management. This first phase will be followed by chatbot project assistants, machine learning-based project management and, finally, autonomous project management. (Lahmann,.2018)

We haven't improved project management much; say many who have worked in the project management industry for years. Every year, some \$48 trillion is invested in various projects. Yet, according to the Standish Group, only 35% of projects are considered successful. The wasted resources and unrealised benefits of the other 65% are staggering. (Costello, 2019)

The modernisation of project management has been a focus of Gartner research and publications for a number of years. One of the reasons for poor project success rates, according to research, is the low maturity of the technologies available for managing project management. Most organisations and project managers are still using spreadsheets, slides and other applications that haven't evolved much in decades. (Lahmann, 2018)

These are adequate if you measure project success in terms of deliverables and deadlines met, but they fall short in an environment where projects and initiatives are constantly adapting - and the business is constantly changing. There have been improvements in project portfolio management applications, but planning and team collaboration capabilities, automation and 'intelligent' features are still lacking. (Costello, 2019)

If applying AI and other technological innovations to project management could improve the success ratio of projects by just 25%, it would equate to trillions of dollars of value and benefits to organizations, societies, and individuals. Each of the core technologies described in the story above is ready — the only question now is how soon they will be effectively applied to project management. (Costello, 2019)

Gartner's research indicates that change is coming soon, predicting that by 2030, 80% of project management tasks will be run by AI, powered by big data, machine learning (ML), and natural language processing. A handful of researchers, such as Paul Boudreau in his book *Applying Artificial Intelligence Tools to Project Management*, and a growing number of startups, have already developed algorithms to apply AI and ML in the world of project management. When this next generation of tools is widely adopted, there will be radical changes. (Longhurst & Woojin, 2023)

2.1 Future skills of project manager

As mentioned at the beginning, AI will undoubtedly change the way projects are delivered and the practice of project management will evolve.

As this happens, it's important to remember that there's one thing AI can't do - it cannot be human. Project managers will stay relevant in the age of AI by focusing on the core skills of project management and gradually moving into work that emphasizes human skills.

(Longhurt & Woojin, 2023)

In summary, AI will be an adjunct to project managers, not a replacement. As with any technology, AI alone will not guarantee success. However, when used in a targeted manner, AI can be a powerful accelerator and game changer for project managers, helping to increase the success rate of projects. The project managers who will succeed are likely to be those who are able to look beyond the limits of the 'human' imagination and answer the questions of how this technology can add real value and drive positive change in project management and business transformation. This will ensure the strategic value of project management. (Longhurst & Woojin, 2023)

Way to improve project performance.

So how do companies maximize the chances that their IT projects deliver the expected value on time and within budget? Gartner surveys of IT executives indicate that the key to success lies in mastering four broad dimensions, which combined make up a methodology for large-scale IT projects that we call "value assurance." The following elements make up this approach: (Bloch et al, 2012)

1) Focusing on managing strategy and stakeholders instead of exclusively concentrating on budget and scheduling mastering technology and project content by securing critical internal and external talent building effective teams by aligning their incentives with the overall goals of projects excelling at core project-management practices, such as short delivery cycles and rigorous quality checks According to survey responses, an inability to master the first two dimensions typically causes about half of all cost overruns, while poor performance on the second two dimensions accounts for an additional 40 percent of overspending (Exhibit 2).

2) Aspects of Project Management that Will Be Disrupted. These coming technological developments as an opportunity like none before. Organizations and project leaders that are most prepared for this moment of disruption will stand to reap the most rewards. Every aspect of project management, from planning to processes to people, will be affected. Let's take a look at six key areas.

3) Better selection and prioritization. Selection and prioritization are a type of prediction: which projects will bring the most value to the organization? When the correct data is available, ML (Machine learning) can detect patterns that can't be discerned by other means and can vastly exceed human accuracy in making predictions. Machine learning -driven prioritization will soon result in: (Bloch et al, 2012)

- Faster identification of launch-ready projects that have the right fundamentals in place.
- Selection of projects that have higher chances of success and delivering the highest benefits.
- A better balance in the project portfolio and overview of risk in the organization
- Removal of human biases from decision-making

4) Support for the project management office. Data analytics and automation start-ups are now helping organizations streamline and optimize the role of the project management office (PMO). The most famous case is President Emmanuel Macron's use of the latest technology to maintain up-to-date information about every French public-sector project. These new intelligent tools will radically transform the way PMOs operate and perform with: (Bloch et al, 2012)

2.2 Technological developments

The coming evolution of technology is an opportunity like no other before it. Organisations and project managers best prepared for this moment of disruption will reap the greatest rewards. Every aspect of project management - from the planning to the processes to the people - will be affected.

The following six areas have been identified: (Nieto-Rodriguez & Viana –Vargas, 2023)

- 1) The capability to anticipate potential problems and to address some simple ones automatically- Automated preparation and distribution of project reports and gathering of feedback. Greater sophistication in selecting the best project management methodology for each project.
- 2) Compliance monitoring for processes and policies. Automation, via virtual assistants, of support functions such as status updates, risk assessment, and stakeholder analysis

3). Improved, faster project definition, planning and reporting. One of the most advanced areas of project management automation is risk management. New applications are making use of big data and ML to help business leaders and project managers anticipate risks that might otherwise go unnoticed. These tools can already suggest mitigation actions, and soon they will be able to automatically adjust plans to avoid certain types of risk. Similar approaches will soon facilitate project definition, planning and reporting. These tasks are now time-consuming and repetitive. They are mostly manual. The use of machine learning, natural language processing and plain text output will result in the following Improve project scoping by automating the time-consuming collection and analysis of user stories. Identify potential problems such as ambiguities, duplications, omissions, inconsistencies, and complexity. Tools that facilitate the planning process and the creation of detailed plans and resource requirements.

Automated reporting that not only requires less manpower to produce. It will replace today's reports, which are often weeks old, with real-time data. These tools will also provide a clear, objective view of project status, benefits achieved, potential slippage and team sentiment, going deeper than is currently possible. (Nieto-Rodriguez & Viana –Vargas, 2023)

4) Virtual project assistants are coming. Virtually overnight, ChatGPT changed the world's understanding of how AI can analyse massive datasets and generate novel, immediate insights in plaintext. In project management, tools like this will power 'bots' or 'virtual assistants'. Oracle has recently announced a new digital assistant for project management that will provide instant status updates and help users to update the time and progress of tasks via text, voice, or chat. (Nieto-Rodriguez & Viana –Vargas, 2023)

The digital assistant learns from past time entries, project planning data, and the overall context to tailor interactions and smartly capture critical project information. PMOtto is a ML-enabled virtual project assistant that is already in use. A user can ask PMOtto “Schedule John to paint the wall next week and allocate him full time to the task.” The assistant might reply, “Based on previous similar tasks allocated to John, he will need two weeks to do the work and not one week as you requested. Should I adjust it?” (Nieto-Rodriguez & Viana –Vargas, 2023)

5) Testing is another essential task in most projects, and project managers need to test early and often. It is now rare to find a major project that does not have a variety of systems and types of software that need to be tested before the project goes live. Soon, advanced testing

systems that are currently only feasible for certain mega-projects will become widely available.

Advanced and automated system testing solutions for software projects will soon make it possible to detect defects at an early stage and to self-correct processes. This will significantly reduce the time spent on tedious testing activities, reduce the number of re-works, and ultimately deliver easy-to-use and bug-free solutions. (Nieto-Rodriguez & Viana – Vargas, 2023)

6) For many project managers, automating a significant part of their current tasks may feel daunting, but successful ones will learn to use these tools to their advantage. Project managers are not going away, but they need to embrace these changes and take advantage of new technologies. We currently think of cross-functional project teams as a group of individuals, but we may soon think of them as a group of humans and robots. (Nieto-Rodriguez & Viana –Vargas, 2023)

With a shift away from administrative work, the project manager of the future will need to cultivate strong soft skills, leadership capabilities, strategic thinking, and business acumen. They must focus on the delivery of the expected benefits and their alignment with strategic goals. They will also need a good understanding of these technologies. Some organizations are already building AI into their project management education and certification programs, and Northeastern University is incorporating AI into its curriculum, teaching project managers how to use AI to automate and improve data sets and optimize investment value from projects. (Nieto-Rodriguez & Viana –Vargas, 2023)

Data and People Make the Future a Reality. When these tools are ready for organizations, how will you make sure your organization is ready for them? Any AI adoption process begins with data, but you must not fail to prepare your people as well (Nieto-Rodriguez & Viana – Vargas, 2023)

“Training AI algorithms to manage projects will require large amounts of project-related data. Your organization may retain troves of historical project data, but they are likely to be stored in thousands of documents in a variety of file formats scattered around different systems. The information could be out-of-date, might use different taxonomies, or contain outliers and gaps. 80% of the time spent preparing a Machine learning algorithm for use is focused on data gathering and cleaning, which takes raw and unstructured data and transforms it into

structured data that can train a machine learning model.” (Nieto-Rodriguez & Viana –Vargas, 2023)

Without available and properly managed data, the AI transformation will never happen at your organization — but no AI transformation will flourish if you don’t also prepare yourself and your team for the change. (Nieto-Rodriguez & Viana –Vargas, 2023)

“This new generation of tools will not only change the technology on how we manage projects but will change completely our work in the project. Project managers must be prepared to coach and train their teams to adapt to this transition. They should increase their focus on human interactions while identifying technology skill deficits in their people early and work to address them. In addition to focusing on project deliverables they should focus on creating high performing teams in which members receive what is needed to allow them to perform at their best.” If you are seriously considering applying AI to your projects and project management practices, the following questions will help you assess your decision. (Nieto-Rodriguez & Viana –Vargas, 2023)

Following questions need answers when discussing about how to collect project data: Are you ready to spend time making an accurate inventory of all your projects, including the latest status update? Can you invest several resources for some months to gather, clean, and structure your project data? Have you made up your mind to let go of your old project management habits, such as your monthly progress reports? Are you prepared to invest in training your project management community in this new technology? (Nieto-Rodriguez & Viana –Vargas, 2023)

Future project manager needs to move out of their traditional comfort zones and radically change how they manage their project. Organization needs to be ready to accept and adopt a new technology and hand over the reins on decisions with increasingly higher stakes we have to let this technology make mistakes as it learns to perform better for your organization? Executive sponsor for this project must have the capability and credibility in your organization to lead this transformation. Senior leaders need to wait sometimes several months, up to one year, to start seeing the benefits of the automation. (Dacre, N. & Kockum, F. 2022)

You must think are you ready to embark on this pioneering transformation. If you have one or more “no” answers, then you need to work on flipping them to “yes” before moving ahead. (Nieto-Rodriguez & Viana –Vargas, 2023)

As we have seen, the application of artificial intelligence in project management will bring significant benefits, not only in the automation of administrative and low value tasks, but even more important, including AI and other disruptive technologies in your toolbox will help your organization, its leaders and project managers select, define, and implement projects more successfully. (Nieto-Rodriguez & Viana –Vargas, 2023)

2.3 How will AI transform project management?

AI offers the possibility of automated processes and intelligent tools. This will reduce manual work. However, based on our experience, it will require a certain level of project management maturity. In addition, AI needs to be equipped with a large data set from which it can learn what works and what doesn't in order to provide deep insights into a project or projects. Having large historical data sets and current project information in a standardised form is really one of the key challenges when it comes to successfully implementing an AI-based project management system.

It's also important to assess what benefits an AI system can actually bring to your projects, as well as your business culture and risk appetite, if you want to implement it in your existing project management environment. Do you want simple automation - a digital assistant that does menial tasks for you - or do you need more sophisticated, in-depth project challenges? Finally, you will also need to make a careful assessment of what it will cost you to realise these potential benefits. (Lahmann, 2018)

To facilitate the predictive management of complex transformation projects and portfolios and thereby increase project success and return on investment, there are great opportunities for the implementation of AI-based project systems in large project organisations and in project portfolio management. (Lahmann, 2018)

When using AI in project management, it is important to remember that project management is a multi-disciplinary discipline. A project manager needs to be skilled in all of them to be successful. In contrast to intelligent agents operating in a defined and stable environment, such as robots producing cars on a production line, a project management environment is undoubtedly much more complex given the nature of projects and the socially dynamic and uncertain environment in which a project must be delivered. (Balyuk, 2024)

By way of example, the talent triangle from the Project Management Institute groups the various required skills into technical project management, strategic and business management, and leadership. (Lahmann ,2018)

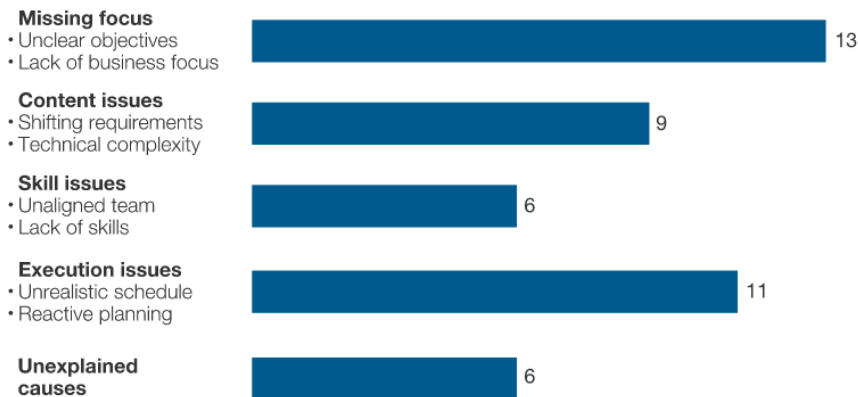
1) Technical project management encompasses the various tasks involved in managing and running a project. Researchers believe that these are the areas that are primarily supported by currently available AI systems. Intelligent project management assistants, bots, and machine learning algorithms support project managers in their daily work by analyzing status and providing data-driven insights and forecasts. (Lahmann ,2018)

2) Strategic and Business Management. Strategic and business management skills are needed, for example, to analyze, judge (based on both rules and emotions) or prepare business decisions. AI can help by preparing parameters, identifying interdependencies, or predicting business outcomes. The more sophisticated the underlying models and the more accurate the data streams available, the better AI can support the project manager. (Lahmann, 2018).

3) Leadership. This area includes various interpersonal competencies such as guiding, leading, and motivating people/stakeholders. The AI systems currently available can, for instance, facilitate candidate selection by presenting a short list or ranking based on a defined set of requirements and patterns – but they do not take emotional and/or social dynamics into account. Added to this, leadership and team management are not considered in current AI systems. (Lahmann ,2018)

FIGURE 1 - IT executives identify 4 groups of issues that cause most project failures.

Rough distribution by cause of the 45% of IT projects that experience cost overruns (for those with budgets >\$15 million in 2010 dollars), %



IT projects with budgets >\$15 million

Cost overrun, 45% Schedule overrun, 7% Benefits shortfall, -56%

Source: McKinsey-Oxford study on reference-class forecasting for IT projects

(Bloch & al., 2012, p. 1-6)

“According to Paul Boudreau, an AI researcher and author of scientific bestsellers about applying artificial intelligence to project management, states that Gartner experts mean something different by this: “Being able to talk to your email instead of typing or having meetings scheduled automatically are not really project management tasks. Project managers need to embrace AI and lead the change to the way projects are managed” (Balyuk Anna, 2024)

In a series of Paul Boudreau’s LinkedIn publications, he answers the question “Will AI replaces project managers?” and named three reasons why this won’t happen:

- 1) Managing data: machine learning algorithms won’t provide any results without organized and structured data, which must be prepared by a project manager.
- 2) Interpreting results and taking actions: AI just provides valuable insights and makes suggestions which then should be considered and approved by a project manager.
- 3) Collaborating: an AI-driven tool cannot bring any desired outcomes without the assistance of a project manager. Only fruitful cooperation between AI and an experienced project manager can result in significant improvements in project management.

Therefore, an AI-driven resource management solution doesn't replace a project or resource manager, it just creates favourable conditions for their productive work and successful delivery of projects. It's a good assistant that lets companies achieve their goals faster and easier. (Balyuk Anna, 2024)

Integration & automation

When it comes to integration and automation there is already a strong focus on streamlining and automating standardised project tasks through workflow integration and process automation. For instance, project budget updates within a database are directly integrated into the budget forecast report without any manual intervention. (Munir, 2019)

Project planning could also be made more robust by enabling auto-scheduling by means of programmed logic and rules, i.e., automatically tracking the progress and status of tasks performed by project team members and alerting a project manager only for intervention in an exception-based scenario. Interaction between incident management tools and project planning tools could be enforced to highlight potential delays based on a high number of defects within certain work streams. (Lahmann, 2018)

Current real-life use cases include:

- Interaction between MS Project Online and Wunderlist for task creation and scheduling
- Using online templates and workflows, e.g., in Slack or MS SharePoint, to reduce time and enhance quality of data.
- Sending alerts when potential budgeting or scheduling issues are identified for the project.

In our view the trend towards integration and automation will continue in the next couple of years, focusing on more effective project management processes. Enhanced tools for streamlining standardised project management will thus emerge from existing project management software providers, workflow management vendors and start-ups. This will increase the quality of standard project management processes and reduce the effort and labour costs involved in basic PMO tasks. The resulting automated project management will reduce costs and at the same time free up project managers to focus on more complex project activities and manage the world outside the project (i.e., stakeholder management). (Lahmann, 2018)

Chatbot assistants

AI chatbots serving as project assistants are the second phase in the evolution of AI in project management. Bots will take a role in human-computer interaction, based on speech or text recognition. (Lahmann, 2018)

Chatbots can take over menial tasks such as organising meetings, plan vs progress checks, reminding project team members of scheduled activities, etc. Chatbots can even include initial insights into the existing data. For example, project assistants could answer questions like “what is my team working on today?” or put these questions to team members. (Munir, 2019)

Current real-life use cases include: Fireflies.ai is an AI bot for Slack that processes conversations within Slack and recognises tasks and assignments on this basis. Stratejos.ai sends team members reminders, tracks their performance, and enables the project manager to recognise top contributors based on measurable. (Lahmann, 2018)

Project task integration and automation, project assistants will continue to take over basic project management tasks and relieve project teams of repetitive work creating little value. In this regard we expect to see the close integration and plug-in of existing and upcoming technologies relating to human-computer interaction in project management. Consequently, the role of the classic project manager leading a PMO, and its staff will increasingly be replaced by intelligent project assistants (chatbots). (Lahmann, 2018)

Machine learning-based project management

Machine learning enables predictive analytics and can provide advice to the project manager, for example on how to set up and steer the project given certain parameters, and/or how to react to certain issues and risks to reach the best possible outcome based on what worked in past projects. (Kühl et al, 2022)

Soon, AI could convert mind maps created by project professionals into a semantic network and derive tasks and their relationships from it. For instance, AI-based project scheduling could include lessons learned from previous projects and suggest multiple schedules based on the context and dependencies. Furthermore, project plans could be adapted and re-baselined in near-real-time based on historical team performance and project progress. An

AI system could even alert the project manager to potential risks and opportunities by using real-time project data analysis. (Lahmann, 2018)

There are currently only a few examples of the successful integration of machine learning in project management, for example:

- Altering scheduling views according to user permissions and preferences
- Using social tagging to identify and connect users based on their posted comments and to identify the best team for a task.
- Machine-learning-based project analytics tool predicting the expected net promoter score (NPS), expected client satisfaction, and expected write-off for PwC-internal projects.

In our view, predictive project analytics will be the most disruptive innovation in project management in the next ten years. It will give project managers increased visibility into what the future may hold for a project and will create value by enhancing the quality of decision making. It will also help connect data to effective actions by drawing reliable conclusions about conditions and future events and enabling decision makers to identify potential risks and opportunities before they occur. An AI equipped with machine learning could even be enabled to take decisions by itself, which will usher in the fourth phase of AI-based project management evolution. However, this phase will require substantial investment to build capabilities in data analytics and machine learning as a basis for modelling highly complex social and economic project environments. (Lahmann, 2018)

Autonomous project management

Like self-driving cars, autonomous project management would require only limited input and intervention from a human project manager. In addition to technical project management processes - which are the primary focus of the previous three phases - an autonomous project management system will also need to fully consider and master the project environment and related stakeholders. These AI systems would therefore need to be able to apply sentiment analysis algorithms to crawl through customer communications and understand stakeholder satisfaction and engagement at any given point in time. (Bloch et al. 2012)

There are currently no real-life use cases supporting fully autonomous project management. In our view, there might be dedicated areas where autonomous project management could serve as an extension of machine learning- based project management in the future, especially in small, non-complex projects. However, looking ahead for the next 10 to 20 years, we believe there are unlikely to be purely self-driven artificial project managers. Among other things this is because project budgets and portfolios will be controlled by humans to manage the risk of autonomous investment decisions. (Bloch et al. 2012)

Too often, IT initiatives are managed purely on budget and schedule, with little regard for strategy and stakeholders. The dangers of this are illustrated by a bank's transformation effort. The finance department became involved only a few months before the system was due to go live. This resulted in several complex changes to the accounting modules because of a recently introduced performance management system. The go-live was delayed by more than three months at a cost of more than \$8 million because of the late changes. (Bloch et al. 2012)

High-performing projects, on the other hand, establish a clear view of the strategic value of the initiative - one which goes beyond the technical substance. By building a solid business case and staying focused on business objectives throughout the project, successful teams can help avoid cost overruns.

They will also be able to ensure, for example, faster response times to customers, obtain higher quality data for the marketing organisation, or reduce the number of manual processes that are required.. (Bloch et al. 2012)

High-performing project teams also improve the ways in which a company manages its internal and external stakeholders, such as business and IT executives, vendors, partners, and regulators. They make sure the project aligns with the company's overarching business strategy and undertake detailed analyses of stakeholder positions. Project leaders continually engage with all business unit and functional heads to ensure genuine alignment between business needs and the IT solutions being developed. (Bloch et al. 2012)

Mastering technology and content

Drawing on expert help as needed, high-performing teams orchestrate all technical aspects of the project, including IT architecture and infrastructure, functionality trade-offs quality assurance, migration and rollout plans, and project scope. The right team will understand

both business and technical concerns, which is why companies must assign a few high-performing and experienced experts for the length of the program. We estimate that the appropriate experts can raise performance by as much as 100 percent through their judgment and ability to interpret data patterns. (Bloch et al. 2012)

Building effective teams

Large projects can take on a life of their own within an organisation. In order to be effective and efficient, project teams need to have a common vision, shared team processes and a culture of high performance. Members should have a common incentive structure aligned to the overall project goal, as opposed to individual work stream goals, to build a solid team.

A business-to-technology team that is financially aligned with the value delivery goals will also ensure that all the critical change management steps are taken and that, for example, communication with the rest of the organisation is clear, timely and accurate.. ((Bloch et al. 2012)

Assessing the black-swan risk

The high rate of failure makes it wise to analyse prospects before starting a large IT project. Companies usually begin with a diagnostic to determine the status of their key projects and programs—both finalized and existing projects (to understand company-specific problems) and planned projects (to estimate their true cost and duration). This diagnostic determines two conditions: the health of a project from the standpoint of the four dimensions of the value-assurance methodology (Exhibit 3) and its relative prospects when compared with the

outcomes of a reference class of similar projects. (Bloch et al, 2012)



FIGURE 2. 'Value assurance' assessment indicates how a project is doing against 4 groups of success factors. (Bloch et al, 2012)

2.4 IT Project management

How to describe project management in literature: IT project management is the process of managing, planning, and developing information technology projects. IT projects exist within a variety of industries, including software development, information security, information systems, communications, hardware, network, databases, and mobile apps. (Project manager, n.d.).

IT project developers deliver a product or service, while managers handle IT project management. Managers oversee communicating expectations and keeping projects on track and on budget to ensure the IT projects run smoothly. (Project manager, n.d.)

IT project management involves overseeing the planning, execution, and completion of projects related to information technology (IT). These projects typically involve the development, implementation, or enhancement of IT systems, software applications, networks, or infrastructure to meet specific business objectives or address organizational

needs. Here's a breakdown of what IT project management entails – Project phases including lot of routine works- maybe some of them can be replaced with AI in the future:

1) Initiation: This phase involves defining the project objectives, scope, and stakeholders' requirements. Project initiation may include conducting feasibility studies, defining project goals, and obtaining approval and funding from stakeholders.

2) Planning: In this phase, project managers develop a detailed project plan outlining tasks, timelines, resources, and budget requirements. They identify project milestones, create a project schedule, allocate resources, and establish communication and risk management plans.

3) Execution: The execution phase involves implementing the project plan, coordinating resources, and managing project activities to achieve the project objectives. Project managers oversee the work of project team members, monitor progress, and address any issues or changes that arise during the project execution.

4) Monitoring and Controlling: Throughout the project lifecycle, project managers monitor project performance, track progress against the project plan, and ensure that project activities are on schedule and within budget. They identify and address any deviations from the plan, manage risks, and adjust as needed to keep the project on track. (Project manager, n.d.)

5) Closure: The closure phase involves formally completing the project and delivering the final product or solution to the stakeholders. Project managers ensure that all project deliverables are met, conduct a post-project review to evaluate lessons learned, and obtain formal acceptance and sign-off from stakeholders. (Project manager, n.d.)

Overall, effective IT project management is essential for delivering successful IT projects on time, within budget, and to the satisfaction of stakeholders. It requires a combination of technical expertise, leadership skills, and project management best practices to navigate the complexities of IT projects and achieve desired outcomes. ((Project manager, n.d.)

2.5 IT- Project Data quality

For analysing project data, it emerged from the interviews those project professionals think AI can be useful when “analysing large data sets” and that “AI can decrease the level of

complex decision-making.” The following citation explains this: “The interviewees repeated the fact that AI is only useful if the project data is fit for purpose” or “If we have data and the tools to analyse the data then in theory some of our complex decision making with large data sets can be reduced and simplified.” (Ataman, 2024)

The use of data in projects also includes the challenge of efficient data management processes. Since AI is highly dependent on the available data, the difficulty in using data in projects indicates there is a low ease of use for AI. This is partly a result of the difficulty of reusing the same data sets and AI models for different problems. The interviewees repeated the fact that AI is only useful if the project data is fit for purpose. The significance of project data was expressed through the following citations: “The expression of ‘garbage in, garbage out’ is very relevant. We [the organisation] are struggling to manage our data the right way and when we don’t have data that is fit for purpose the AI output will reflect that.” “We use AI to analyse large sets of project data, which we otherwise would not have the time and resources to analyse. (Austin, 2023)

The following is valid wherever data needed. Ensuring data quality also means addressing biases present in the data, which is essential to avoid perpetuating and amplifying these biases in AI-generated outputs. This helps to minimize unfair treatment of specific groups or individuals. (Ataman, 2024)

Furthermore, a diverse and representative dataset enhances an AI model’s ability to generalize well across different situations and inputs, ensuring its performance and relevance across various contexts and user groups. Ultimately, maintaining data quality is key to realizing the full potential of AI systems in delivering value, driving innovation, and ensuring ethical outcomes. “If 80 percent of our work is data preparation, then ensuring data quality is the important work of a machine learning team.” (Ataman, 2024)

Why getting rid of the “garbage in and garbage” concept is crucial for data quality - “Garbage in, garbage out” (GIGO) is a concept in computing and artificial intelligence (AI) that highlights the importance of input data quality. It means that if the input data to a system, such as an AI model or algorithm, is of poor quality, inaccurate, or irrelevant, the system’s output will also be of poor quality, inaccurate, or irrelevant. (See figure 3).

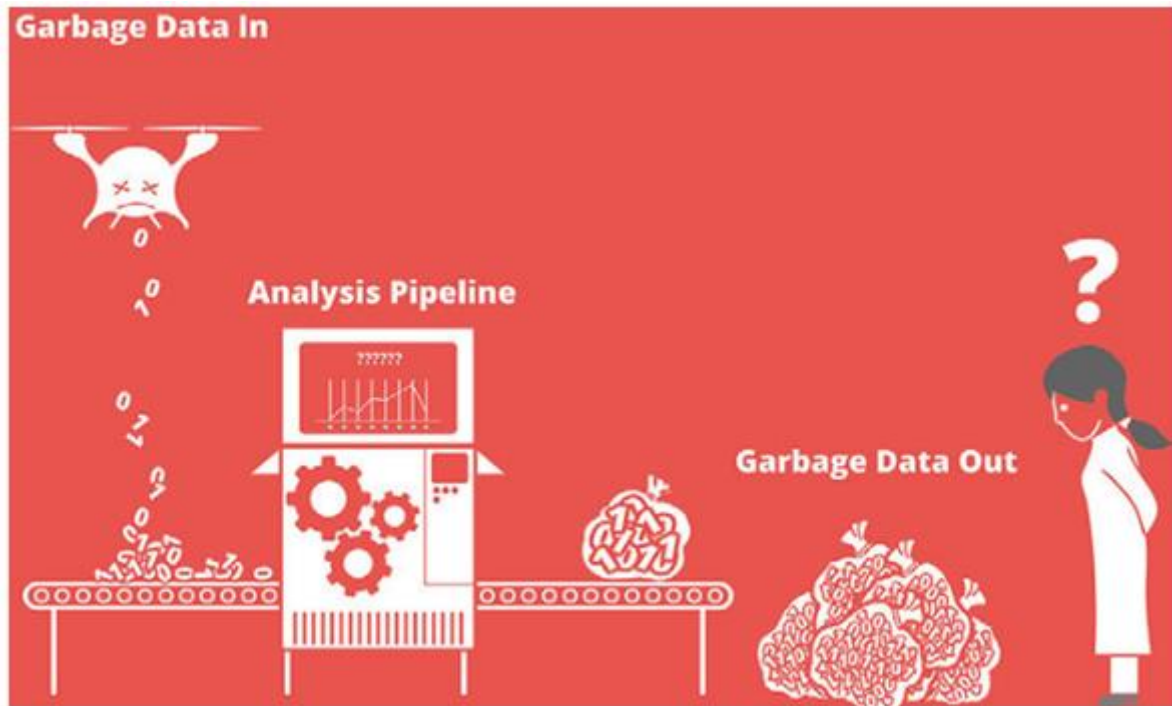


FIGURE 3: Shakoor et al., 2019 Data quality and standard

This concept is particularly significant in the context of AI as AI models, including machine learning and deep learning models, which rely heavily on the data used for training and validation. If the training data is biased, incomplete, or contains errors, the AI model will produce unreliable or biased results. (Ataman, 2024)

To avoid the GIGO problem, it is crucial to ensure that the data used in AI systems is accurate, representative, and of high quality. This often involves data cleaning, pre-processing, and augmentation, as well as the use of robust evaluation metrics to assess the performance of AI models. (Ataman, 2024)

Key components of quality data in AI

Accurate data is crucial for AI algorithms, enabling them to produce correct and reliable outcomes. Errors in data input can lead to incorrect decisions or misguided insights, causing potential harm to organizations and individuals.

Consistency ensures that data follows a standard format and structure, facilitating the efficient processing and analysis of the data. Inconsistent data can lead to confusion and misinterpretation, impairing the performance of AI systems.

Completeness: Incomplete data sets can cause AI algorithms to miss essential patterns and correlations, leading to incomplete or biased results. Ensuring data completeness is vital for training AI models accurately and comprehensively. (Ataman, 2024)

Timeliness: Data freshness plays a significant role in AI performance. Outdated data may not reflect the current environment or trends, resulting in irrelevant or misleading outputs.

Relevance: Relevant data contributes directly to the problem at hand, helping AI systems to focus on the most important variables and relationships. Irrelevant data can clutter models and lead to inefficiencies. (Ataman, 2024)

Challenges of ensuring data quality in AI

1) **Data Collection** - Organisations face the challenge of collecting data from multiple sources while maintaining quality. Ensuring that all company data points follow the same standards and eliminating duplicate or conflicting data is complex. (Ataman, 2024)

2) **Data Labelling** - AI algorithms rely on labelled data for training, but manual labelling is both time-consuming and prone to errors. The challenge lies in obtaining accurate labels that reflect real-world conditions. (Ataman, 2024).

3) **Data Storage and Security** - Maintaining data quality also means protecting it from unauthorised access and potential corruption. Ensuring secure and robust data storage is critical for organisations. (Ataman, 2024).

4) **Data Governance** - Organisations often struggle to implement data governance frameworks that effectively address data quality issues. A lack of proper data governance can lead to siloes data, inconsistencies, and errors. (Ataman, 2024).

2.6 Artificial Intelligence in IT- project management

With different types of AI technologies, there is a possibility that experts may have different interpretations of AI. Each report does not imply that computers can think, feel, or act like humans. Instead, it takes the perspective that computers can optimise certain tasks that can be perceived as being performed in an intelligent manner. The following definition of AI in project management is used: "Artificial Intelligence - this refers to the study of 'intelligent agents', autonomous non-human entities that can take in information from their environment

and act on their environment in ways that enable them to achieve their goals. Intelligent agents need to have mastered machine learning and aspects of predictive data analysis to be able to do this. In a project context, some have speculated that an intelligent agent could enhance or change the roles and status of many project professionals". The importance of AI in complex projects was confirmed in the survey, and project professionals who responded believe that complex projects are more likely to benefit from AI than a simple project. (Blumberg et al. 2024)

Types of Artificial Intelligence

It became clear that different AI techniques have been developed for different purposes. For example, an AI chatbot can be applicable during the execution phase for communication with project stakeholders. Whereas advanced AI technology, based on machine learning, is suitable for prediction tasks. Deep learning is another set of AI technologies applied to analyze complex data sets. Other problems that do not require machine learning may use less complex AI techniques based on expert systems. (Blumberg et al. 2024)

As a project manager you already have enough on your plate. There are risks planning for and mitigate; resources to distribute and organize; budgets to plan for the year ahead; stakeholder meetings to schedule and attend; and daily operations and tasks to coordinate. It all starts getting hectic, especially towards the year end. (Wells, 2023)

Thankfully, the rapid evolution of artificial intelligence makes the role of a project manager so much easier. You can be more efficient in your work, keep track of project milestones and deadlines, be more confident with your decision making and planning, and get more creative with resources what you have when boost your workflow by integrating AI tools. (Munir, 2019)

Firstly, as a project manager, you will want to ensure that you are comfortable using an AI-powered project management tool. There are tons of apps and software out there, but not all of them will resonate with you or be suitable for the way you work. Project manager needs to begin with determining what aspects of your work you need automated, what are the key features you require, and evaluate the user experience based on reviews of people who have used it successfully in their project management. (Wells, 2023)

Simply, any task that a human can do could be accomplished by general AI. It technically has all the potential of a human brain. It could tackle any problem or task in any area,

whether it is music composition or logistics—all the potential actions humans can perform. This includes the following intellectual tasks: (Lee & Qiufan 2021

Generalize knowledge and apply it as applicable to different circumstances. Humans learn from experience. They take learning from various experiences and apply it as it makes sense to other situations they encounter. This would be an example of strong AI. (Lee & Qiufan 2021)

Use knowledge and experience acquired to plan. Another ability humans have is to use their life experiences to plan. As they encounter more experiences, they can use those experiences to create a plan and drive the future. In narrow AI, the machines must rely on humans to program actions. The machines are not capable of putting a plan in place for the future. (Lee & Qiufan 2021

Recognising needs and emotions - General AI would also be able to read the needs, emotions, thought processes and beliefs of other intelligent entities. This is known as Theory of Mind level AI. There's nothing to simulate or replicate with this type of AI, but rather machines that truly understand humans (Lee & Qiufan 2021

We've learnt an enormous amount about the human brain, but there's still an enormous amount to understand. To create general artificial intelligence, it will be essential to fully understand the human brain. (Lee & Qiufan 2021)

Natural language processing (NLP) is critical to fully and efficiently analyze text and speech data. It can work through the differences in dialects, slang, and grammatical irregularities typical in day-to-day conversations.

Future trends of AI in Project Management

1. Present specific cases of AI and project management during the development of this report, it became clear that the project community lacks practical examples of how AI can be implemented and used in projects. Using case studies from specific project industries will spread best practice and inform the project community of avoidable pitfalls when using AI. (Dacre, N. & Kockum, F, 2022)

2. Explore possible frameworks and best practices for AI implementation the research team discussed AI in project management in different settings of industry and academia and found

that interest in AI is high. However, the survey found that experience of using this technology is generally low. The project community does not lack enthusiasm for AI, but overall is short of experience in how to implement it. It is recommended to explore possible frameworks and best practices for professionals to adopt which will ease the implementation of AI in projects. (Dacre, N. & Kockum, F, 2022)

3. Study how project professionals' roles will be impacted by AI It is necessary to understand the future change in project professionals' roles when using AI. This may include professionals requiring new skills to harness the potential of data, but also new ways of working and new processes when using AI. (Dacre, N. & Kockum, F, 2022)

4. Discover how project professionals can use AI for more than project planning the survey found that project professionals prefer using the AI element of project planning. However, during the interviews the research team was able to ask further questions on this topic and found examples of AI chat bots being used to receive project updates and for communicating between project stakeholders. The report suggests further study of project areas beyond planning where AI can be applied. (Dacre, N. & Kockum, F, 2022)

Opportunities in AI-Powered Project Management:

In summary, AI will assist, not replace, project managers. As with every technology, AI alone will not guarantee success. However, deployed purposefully, AI can be a distinctive accelerator and game changer for project managers and thus help increase project success rates. The project managers who succeed will likely be those who manage to see beyond the bounds of 'human' imagination, and answer questions about how this technology can add real value and drive positive change in project management and business transformations. This will ensure the strategic value of project management. (Lahmann, 2018)

- Predictive Analytics: AI can analyze historical project data to predict potential risks and delays, enabling proactive mitigation strategies.
 - Resource Allocation: AI can optimize resource allocation by considering project priorities, skills, and availability, leading to better resource utilization.
 - Automated Reporting: AI can generate real-time reports and dashboards, reducing the manual effort required for reporting and improving decision-making.
 - Improved Collaboration: AI can facilitate collaboration by suggesting team members with complementary skills or by identifying potential bottlenecks in workflows
- AI Impact on Society and Jobs (Lahmann, 2018)

Forbes says that the future of AI brings endless possibilities and applications that will help simplify our lives to a great extent. It will help shape the future and destiny of humanity positively, whilst Bernard Marr & Co says that the transformative impact of artificial intelligence on our society will have far-reaching economic, legal, political, and regulatory implications on all types of jobs and industries that we need to be discussing and preparing for. Others in the know say that AI has the potential to bring about numerous positive changes in society both now and in the future, including enhanced productivity, improved healthcare, and increased access to education. AI-powered technologies can also help solve complex problems and make our daily lives easier and more convenient. (Talmage-Rostron, 2024)

3 Research Framework

3.1 Research Questions

The main purpose of the study is to clarify how IT –project managers using AI in their work now: What value AI can bring to their work and the company where they are working and what are the project data potential for the future. What skills future IT –project manager will need to adopt changing project manager role and what are the future implications for project manager work.

Main research question: What value AI can bring to IT project management?

Sub research questions what skills future IT project manager needs? What is value of IT project data to AI?

3.2 Research Methodology

This research following Research-oriented methodology, trying to find a practical solution to using and get benefits by using AI to being part of project management. The research-oriented thesis is based on the basic structures commonly used in quantitative and qualitative scientific research. The goal was to provide richer responses to the research question by integrating results from both methods. These interviews allowed for clarification of quality-related questions. This thesis is based on qualitative research, research questions and interviews with people involved in the project manager's role.

The collection of research data was carried out using a concurrent mixed research method that involves the separate use of qualitative and quantitative methods within a single phase of data collection (Ojasalo et al. 2015, 16).

Case study is a typical empirical research method in business economics that uses data obtained in different ways to analyze a particular contemporary phenomenon or activity in a specific setting, such as a company or other organization. The aim of a case study is to provide a comprehensive and detailed description of a strictly defined object of study in a realistic setting. The case study does not aim at generalizability or objectivity, but at an in-depth understanding of a specific case. Case studies often answer the question "how?" and "why?" and is therefore suitable as a development method when the aim is to generate suggestions and ideas for the development of the case under study (Ojasalo 2014, 52-53.)

AI in project management is not a new topic for discussion. In 1987 Levitt and Kunz developed a research study called "Using artificial intelligence techniques to support project management", which focused on AI as cognitive support. They suggested that AI techniques could extend the functions of computer-based project management.

More recent research into applying AI techniques to specific project management activities shows positive results. Wauters and Vanhoucke (2016) found AI techniques to be accurate in estimating project duration. Pospieszny et al. (2018) showed that AI techniques are highly accurate in estimating effort required in software projects. These examples show how AI can be used to optimize project management tools and techniques. However, very little research has focused on how project professionals perceive AI.

The target group of the study was people who manage IT projects (the title of project manager or project manager/Program leader), working on IT projects for the client and/or in the IT department of a larger company. Some of the interviewees were self-employed consultants and some were employed. All of them have been in project manager positions for quite a long time, with at least 5 years of project manager experience, but some had up to 32 years of project management experience.

This study is not specific to any one company but is conducted from a general perspective. The study does not cover all possible AI solutions and focuses on improving project management through AI, rather than taking a position on the project model or how it should be done in the organization.

Validity

Validity is the ability of the research to measure what was intended. This means the ability of the researcher to transfer the concepts and overall idea of the research theory to the empirical part of the research. Measures of validity are how successfully the theoretical concepts have been translated into everyday language, how successful the content of the questions and response options have been, and how successful the chosen scale of the research has been. (Vilkka 2007, 150.)

Reliability

Reliability is the ability of research to produce non-random results. Reliability assesses the stability of research results from one research to another. The reliability of the research analyses the measurement and accuracy in conducting the research. The reliability measures can be the sample size and quality, the response rate, and the possible measurement errors in the research. (Vilkka 2007, 149-150.)

The results of the research were largely formed by respondents who had been working in IT project management for more than 5 years. This increases the reliability of the research, as most of the respondents were very familiar with all areas of IT project management. The researcher also tested the survey on an individual who does not work in IT project management and is not familiar with AI to ensure the validity of the research. The individual understood the questions in the intended manner. The functionality and understandability of the survey was tested by the same individual.

In addition, the researcher used current and relevant resources in the dissertation process. The researcher selected resources from literature, articles, and reliable websites, such as Harvard Business School and Forbes, to ensure that the theoretical framework was built from different reliable resources.

3.3 Research Design

This interview I am using a Semi-structured interviews i.e., a thematic interview, the questions asked to the interviewee are prepared in advance, but their location can be varied if desired. In addition, the format of the questions can be adapted, and the exact wording can vary between interviewees. Some of the pre-prepared questions may be omitted as the interview progresses and, conversely, the interviewee may be asked unprepared questions.

Thematic interviews are one of the most widely used qualitative research methods. It allows for a particular freedom of form and the identification of the subjective experience of the informant and facilitates the placement of the information produced by the interviewee in a broader context (Hirsjärvi, Hurme 2001, 34-35).

I chose semi-structured thematic interviews as the method because I think it best suits the purpose of my thesis. In my review of previous research on the use of AI in IT-project management, I found that little research has been done on this topic. Qualitative research interviews are well suited to an area that is still unknown, and the content of the researcher's responses is difficult to predict (Hirsjärvi & Hurme 2001, 35).

The perspective of the research must be placed in a broader interdisciplinary context. In this respect, qualitative interviews are also considered a suitable method (Hirsjärvi & Hurme 2001,34-35)

The goal was to provide richer responses to the research question by integrating results from both methods.

3.4 Data Collection

The interviewee conducted interviews with five persons using the Appendix 1 interview form. The interview began by discussing the interviewee's work history and experience. Subsequently, questions focused on the use of AI at work, particularly in IT management. These questions covered themes such as AI challenges, possibilities in IT project management, the role of project data in maximizing AI benefits, and the importance of data quality. The interviewee also shared insights into challenges faced when using AI, especially when data quality is suboptimal.”

The frame provided by the IQA-questionnaire enabled a broad view of the topic and at the same time the use of an established method increases the reliability of the study by reducing the impact of the researcher's own preconceptions (Saunders et al. 2019, 122; Eskola et al. 2014, 16).

On the other hand, a wide range of questions may impair the interactivity of the interview (Eskola et al. 2014, 17), so the interviews focused specifically on the answers of the interviews by asking more specific questions.

All of them work in the IT industry and have experience as project and program managers, ranging from a minimum of 5 years to a maximum of 32 years. Five of the interviewees also have top management experience and board-level experience within companies. The interviews were conducted either using Microsoft Teams or Gmeet

The interviewees had diverse educational backgrounds. Three of them had an IT engineering background, one had a mechanical engineering background, and another held a master's degree in economics. All of them possess various certificates, which is common for individuals with extensive experience in the IT industry on average, the interviews lasted one hour.

All interviewees received the interview questions in advance, prior to the scheduled interview time. Interestingly, I received a high number of volunteers, which is unusual given the challenges of securing interview participants. Perhaps the subject of the diploma work played a role in generating interest.

The purpose of the interviews is to explore the views, experiences, and expertise of the interviewees regarding the use of AI in IT project management. The goal is to create a comprehensive understanding of AI's role in IT project management. These interviews aim to collect qualitative research material that supports my thesis research question. Given the broad subject, I've chosen predefined questions to ensure we stay focused on the topic.

The interviewees will be described by the letters U, V, X, Y and Z. In this way we will maintain their full anonymity. For each of them, we will outline the answers to each of the sections of the interview schedule.

All 5 interviews following same questions and themes. I used themed questions because otherwise it is risky that you will not answer for your original subject of research. All interviewed persons were interesting about the subject. One challenge was to get interview meeting end in time. All interviews recorder by using teams or gmeet recording tools. Research results based on interviewees and in interview we follow Appendix 1 questions.

First question was background question - 3/5 respondents were business owners, working as independent consultants (one-person companies) or in their own IT Company providing IT project management services. 2/5 respondents work in large companies and hold a position in the company's board of Management.

Title	Female	Male
Business owner	1	2
Top Management		2

FIGURE 4 – Top Management and Business owner

Background question 2 - 2 out of 5 respondents have 5-15 years' experience of IT project management work, 2/5 have 15-25 years' experience and one has over 25 years' experience of managing IT projects. All respondents were experienced IT project managers.

Experience about IT -Project management work	Chosen alternative
5-15 years	2
15- 25 years	2
Over 25 years	1

FIGURE 5 - Experience in years

1) *Use of AI - based on the following questions Have you used AI in your work as an IT project manager? If not, why not?*

Regarding the use of AI, let's explore the responses to the following questions posed to IT project managers:

Respondent U: Has some experience with AI but hasn't used it at work.

Respondent V: Uses AI in daily project management tasks.

Interviewee X: Hasn't used AI due to a perceived lack of value or benefits. Prefers using Excel.

Interviewee Y: Uses AI daily and finds it beneficial.

Interviewee Z: Has used AI but is still assessing its value and benefits.

Overall; 4 out of 5 respondents have either used or tested AI. However, it's evident that the benefits and value of AI remain unclear to some."

Where have you used AI? Has it helped you in your day-to-day project management? How have you used AI?

"Interviewee U has explored AI while creating stories and art. Using AI for visual creations is a fascinating hobby. I've experimented with free AI art generators like openArt, Picsart, Bing, and Copilot. However, when it comes to my daily IT project management work, finding practical examples has been challenging. I'm unsure how to effectively integrate AI into my routine tasks. Although I've tested some prompts from social media, they haven't proven very useful for managing IT projects for clients. Additionally, the limitations of the free versions prevent me from handling business-specific data securely".

"On the other hand, Interviewee V actively incorporates AI into daily IT management tasks. By following AI gurus and leveraging different prompts, AI serves as their sparring partner—a valuable resource for finding solutions. Their dream is an AI virtual assistant that analyzes project planning, resource allocation, schedules, and risk data continuously. This proactive monitoring helps detect any deviations from the right track. While they avoid using business-specific data, they adapt general examples to real-world situations. Free Copilot and Chat GPT 3.5 are their trusted sparring partners".

"Respondent Y uses AI on a daily basis, especially when taking notes during presentations or meetings using Copilot. AI helps me in daily routine work. I'm not an expert in creating prompts, but I've copied some from LinkedIn and got ideas on how it works".

"Interviewee Z has used AI, but only just tested how it works using some free prompts examples that are available on social media like LinkedIn. Somehow it still feels like some kind of trend and for me it has been a learning experience - I am still looking for some real benefits and value for daily project manager's work, maybe some prediction based on available project data and report? I have been learning and studying various AI tools during this spring, but I am still looking for real benefits for work. Could you suggest something for me?"

2) *Challenges and opportunities of AI in IT project management - Based on the following questions*

What challenges have you faced when using AI? What positive things have you found when using AI in your project work? How can we use AI to find critical tasks in a project? Give an example if possible. Can AI be used to reduce project costs and waste of time and money in IT project management?

"Interviewee U said that because the company's top management doesn't see the value of AI, they don't think it's relevant to our company. AI is not part of the business strategy. It is hard to understand. It is everywhere and at all levels. People need to understand what the future of AI is. I haven't used it at work, just as a hobby, but because of this experience I must find the right tools to use it in daily IT project management. It would be great to have a virtual project assistant to prioritize things - it's very difficult to prioritize tasks, because if you ask the customer, they are all priority 1, and they can't be, it would be great if AI could use its algorithm to analyze and evaluate things? It's also very hard to estimate how much time a task will take - it would be cool if the virtual assistant could do that using average estimation. I think it should be possible in the future. It also saves costs and time".

"Interviewee V has the following challenges - free version doesn't secure data - I've only used Copilot at the moment because they said data is secure, but it would be nice if companies invest money in AI and IT development. It can be a real competitive advantage if we could use it in a more effective way. Based on our company skills and experience, we could develop some kind of AI tool, maybe project risk analysis? It is somehow funny when creating risk table, you already know that risks are always almost the same. It would be nice to have a tool that takes care of risk management, that is also cost and time effective. There. I also would like to use time and energy to skills what future project manager should have, that he can get more out when using AI in daily project work."

"Interviewee X hasn't used AI, but it seems to be a similar trend to the internet 30 years ago. It is difficult to see the practical benefits, I am looking for something clear how to reduce costs and improve basic project management. I hate discussions about AI and algorithms, I can't understand it - what is it I practice? I like the idea that we can reduce manual work, but how do we do it?"

"Interviewee Y sees that the benefits and value of AI is difficult to see because we don't fully understand it, we have other options like automation that tell us a lot more, we can use

robotics to improve the production process, but it's not clear to me how to use AI in daily routine IT project management work? It's still under construction - we don't clearly understand how it works. I follow some AI gurus on social media, but even I have used and see how I can get some benefits by doing things by AI. We can't get benefits from AI if we don't see how to use it, that's what I'm looking for. Yes, it can be our sparring partner and help us survive, but how can we get more out of using AI?"

"Interviewee Z has also seen that the biggest challenge is to understand how to use AI in your day-to-day IT management work? Some kind of virtual assistant maybe? But first we need to solve what AI is for our company and how we could use it in our work. Should we develop and invest in AI or how should we proceed? If we don't clearly define what AI is for us, we can't really get any benefits from using it, for me it's clear that we can minimize routine work by using AI - but what are these routine works? I still lack some kind of good examples".

3) *Project data quality*

What role does project data play when trying to get more out of using AI? What is good data quality in AI when it comes to project management data? What kind of challenges have you faced when trying to use AI and data quality is not good?

"Interviewee U - Data is everything, even when we are trying to use AI more in project management. We've been talking about data for at least 15 years but we're still struggling with the same problem, data quality is not good, it's in different places, we don't have all the data we need, and we haven't defined what data we need in terms of project data. Data quality is good enough if we don't have a data problem; I mean if the data is garbage, we have garbage in garbage out problem. I must look in the mirror because I am the owner of the company, so I should decide and start to improve the project data and define where to start. I think we've been talking about the importance of data for a very long time, but we haven't really solved the data problem.

"Interviewee V believes that data is key if you want to use AI more. Free AI solutions offer help for routine work, but when we talk about real benefits, data plays a crucial role. We've been discussing the role of data for a long time, but I think it's more focused on sales and financial data, which are of course important for project work, but it would be nice to have more data about why project delivery is delayed, why the estimation failed, how we can prioritize tasks during the projects and make sure we do them in the right order? I think AI

can't completely replace the project manager, but if we could have better data, AI could help us to be more successful in the project manager's work".

"Interviewee X hasn't used AI in his work but said that he understands the importance of project management data, data is undervalued in project management work. We don't use data as much as we could, we don't analyse data enough. In that case, AI could be the helping hand. We haven't really changed how we measure the success of projects; you'll find out exactly what the quality of your data is. I hope and wish that we can evolve how we measure things in the project and evolve that part of the project as well. Data analysis is still in its infancy, and I believe that through AI we could get more ideas on how to improve project management itself. Without data, we know that we can have unrealistic expectations from project manager, and we don't understand the role of project manager. I hope that quality of data will help us to use more AI help and leave more time for project manager to coach people to do their things. We can make wrong decision because of bad data, and it doesn't give us the power that it can. That's why I hope we'll pay more attention to data quality and in project management that we have it available".

"Interviewee Y sees that data is key but sees a lot of problems because project data is often not in the same place, and therefore we can't use it as much as we could. An organization can have many project managers managing different IT projects and they don't handle project data in the same way, so that's a challenge. Even if we could have project data in the same place, we will need at least one analyst or AI analyst to analyze project data and get results. We also need to understand what we are looking for when analyzing data. Data is good enough if we can touch data and know it is correct".

"Interviewee Z thinks that data is very important. It is all; data quality situation has not really moved much for 20 years. Data is not in the same place, and we can't get everything out of data. We don't have really defined project master data, so quality is difficult to define. We need to think more about how to analyze data. It's frustrating that we've been talking about "data is a king" for several years now, but we haven't really improved it at all. We have the same problem with data as we did 10 years ago. Project data is good enough if you get the results you want, but I can't analyze that project data - AI data assistant would be nice".

4 Analysis and Results

. This chapter presents the empirical findings of the research. It begins with a review of the practical aspects of data collection procedures. Subsequently, the results obtained are presented, along with preliminary analyses.

4.1 Analysis

The interviews took place between February and March 2024. All the people who took part in the survey were familiar to the researcher through their work. They were selected as interviewees because they all had long experience in IT project management. 5 people were selected for the study. All 5 persons who were sent a questionnaire about their interest in participating in the study were willing to participate in the interviews. A separate online interview appointment was arranged with them by email.

The interview material was analyzed using the content analysis methods. Essential points from the perspective of the research questions were extracted from the material and then unified and themed into entities relevant to the research question (Tuomi et al. 2018, 56-76).

The analysis phase was started by listening recorded interviews. Interviewees comments about each question were wrote down carefully. The recorded material was summarized and important points for the study were selected, such as mentions of possible causes for problems with using AI in IT-project management work. Experience about using AI in project management and best practices using AI in project management discussed and written carefully to suggested conceptual framework.

In addition, the interviewee's answers collected and analyzed to getting status and conceptual framework for using AI in IT project management based on questions what we asked in interview and answers. We had to also ask background questions in interview to understanding level of AI knowledge in each interviewed person because it has impact to their answers. It seems obvious that less experience about using AI in your IT project management work causes more negative assumptions.

All questions and their answers are seen in chapter results and based on interviewee's answer created conceptual framework about using AI in IT Project Management, it also contains some suggestions and ideas about how interviewees use AI in daily IT Project

Management and clarify the problems and possibilities to get more out at work when we talk about Artificial Intelligence and its ability at daily IT Project Manager's work.

Interviews Analysis Summary

In the analysis of the five interviews conducted for this research, it is evident that four out of five respondents have either used or tested AI. However, the benefits and value of AI remain unclear to some.

Based on the theoretical framework, it appears that AI, being a relatively new tool, does not necessarily offer immediate benefits and value to project managers. The analysis of interviews has indeed confirmed this observation.

We can summarize of the interviewees experiences and perspectives related to AI usage in project management: Struggles to find practical examples for daily IT project management, Uncertain about effective AI integration into routine tasks due to limitations of free versions. Actively incorporates AI into daily IT management. Adapts general examples to real-world situations and Trusts free version Copilot and ChatGPT as sparring partners.

Analyzing interviews following Challenges mentioned in AI for IT Project Management: Some organizations struggle due to top management's lack of recognition of AI's value and relevance. Despite AI's pervasiveness, comprehending its potential and future impact remains challenging. AI could objectively analyze and evaluate task priorities, especially when stakeholders have conflicting views.

AI powered project management require different skills. AI can automate administrative tasks, freeing project managers for strategic work. AI tools assess risks, rank them, and suggest mitigation strategies. AI can improve task duration estimates, streamlining processes and decision-making reduces costs and saves time. AI offers significant potential for enhancing project management efficiency and effectiveness.

Future AI powered IT project management will change the project manager's work and offer opportunities to enhancing project management efficiency and effectiveness - it is same perception than in theoretical framework. AI needs human power and not replace project manager's work but the role will change and requires different skills than today.

A summary of the key points related to project data questions what came out from interviews: Project data plays a central role when leveraging AI in project management. High-quality data informs AI models, enabling them to provide valuable insights and predictions. Good data quality ensures accurate and reliable AI outcomes:

Recognized data management challenges:

- Common issues include data fragmentation (data in different places),
- Incomplete data and lack of clear definitions for necessary project data.
- Challenges Faced When Data Quality Is Poor: Garbage In, Garbage Out: If data quality is subpar, AI results will be similarly flawed.
- Data Ownership and Decision-Making: As the company owner, addressing data quality is crucial. Decisions must be made to improve project data and define priorities. Despite the long-standing recognition of data's importance, solving data quality challenges remains an ongoing endeavor.

This perception support research questions and theoretical framework about importance of data quality and data management when trying to get out true benefits and value when using AI in project management.

4.2 Research Results

During interviews, project managers mentioned using prompting as part of their day-to-day work. Many views AI as a 'sparring partner.' However, it's essential to recognize that AI doesn't mimic human behavior. It responds based on how it's instructed.

Respondents emphasize the importance of project management data. Companies often overlook data quality and measuring project success. While data is valuable, it's not yet the 'king.' IT project management data is scattered across various systems and managers use tools differently. We should prioritize defining and collecting master data for better project outcomes. Mere talk about data's importance won't suffice; action is needed. Without addressing data challenges, AI won't provide substantial benefits to companies." Based on the interviewees' responses, it's evident that discussing project data at the company level is essential. Here are some key considerations (Appendix 2):

- **Guidelines for Data Collection:** Establish clear guidelines for collecting project data. These guidelines should define how data is captured, stored, and organized within the software system.
- **Consistency:** Ensure consistency in terminology, units, and formats across different teams and projects. Consistent data practices enhance data quality and facilitate meaningful analysis.
- **Data Collection Sheets:** Consider creating data collection sheets (perhaps included in an appendix) that outline critical issues related to project data. These sheets can guide project managers in collecting relevant data effectively.

While tools like AI can analyse data, they can't improve data quality directly. Addressing data challenges is crucial for maximizing AI benefits. If we focus on better project data management, AI can offer deeper advantages to companies.

Incorporating AI into a company's future vision and strategy is crucial. At the strategic level, we must define our stance on AI—whether we embrace it or not. If we choose to use AI-oriented tools, we should also delve deeper into defining master data and take action to address recognized challenges.

Despite current low adoption rates, interest in AI is evident. Companies eagerly awaited the research results, particularly the survey responses regarding AI's most useful areas in recruitment. AI is perceived as beneficial and value-adding to businesses. Anticipate broader AI adoption in the future.

While AI won't replace IT project managers, it can enhance their effectiveness and the job will change. Company management should actively engage in AI discussions, clarifying how AI fits into the organization's strategy and whether they're committed to AI integration."

The research process is a time-consuming yet interesting endeavor. In the empirical phase, the researcher gained further insights into conducting surveys and analyzing data.

Additionally, time management skills were honed, allowing for a balanced allocation of time between work and research. Investigating AI in IT project management is both challenging and highly relevant. AI presents numerous opportunities for enhancing project management practices. My own research has garnered significant interest due to its pertinent topic. I received valuable qualitative feedback and diverse perspectives.

5 Conclusion

5.1 Main findings

The chapter revisits the core findings of the research, summarizing how the results effectively address the research questions. It then continues by suggesting topics for future research.

The thesis has explored the value that AI can bring to IT project management, the evolving role of IT project managers, and the significance of project data in our AI-driven world. Valuable insights have been gathered, which will significantly inform future developments in this field. Artificial Intelligence is reshaping the role of IT project managers, influencing company strategy and top management decisions. It adds value to the IT industry and project management work by optimizing routine tasks and leveraging AI and data for process improvement. An AI-driven project management framework enhances resource utilization and customer experience through effective time management and leveraging available project data, leading to cost savings.

Given the potential for AI to replace or support various tasks, there's an opportunity to enhance IT project management. Although AI adoption remains limited, interest in its capabilities is evident. The thesis explores AI feasibility in project management and identifies applicable types. Currently, only a small proportion of IT project managers use AI, but its full potential remains untapped. While AI won't replace project managers entirely, it will transform their responsibilities, allowing them to focus on human-oriented tasks while AI handles routine work like meeting notes.

The primary use of AI in IT project management is to assist with daily resource allocation, prioritization, and routine challenges through various prompts. Another common application is using AI to handle routine tasks, such as generating meeting memos and facilitating communications—tasks typically performed by project managers.

However, there are significant challenges in adopting commercial AI tools for daily use. Companies often hesitate due to costs, and they haven't definitively established whether AI is a critical tool in IT project management. Free AI versions may lack the necessary security for handling sensitive business data related to projects. Additionally, many employers remain uncertain about the value of AI, which impacts their willingness to invest in commercial

versions. Creating a curated list of relevant AI tools specifically tailored for IT project managers could be beneficial.

5.2 Opportunities to further Research

Looking ahead, more research is needed to explore the potential of AI in project management, particularly focusing on integrating virtual assistants. Despite the industry's longstanding emphasis on data ("data is king"), practical challenges persist. Fundamental issues like defining master data and establishing effective data management processes remain unsolved. High-quality project data is essential for successful AI implementation. Additionally, optimizing the utilization of project data to improve project outcomes warrants further investigation. Addressing data collection methods is a critical bottleneck in advancing AI adoption within IT project management.

Lastly, the role of management and business owners is intriguing. For AI to be a competitive advantage, it's crucial that decision-makers understand the value and implications of different AI approaches.

Notification: The author has used Microsoft Copilot AI to check the English language used in the master's thesis.

References

Amazon Aws.N.d. What is Natural Language Processing (NLP)?

<https://aws.amazon.com/what-is/nlp/>

Anderson, J. & Coveyduc, J. 2020. Artificial intelligence for business: a roadmap for getting started with AI. John Wiley & Sons, Inc. New Jersey.

Ataman, Altay, J 3.1.2024. Data Quality in AI: Challenges, Importance & Best Practices in '24

<https://research.aimultiple.com/data-quality-ai/>

Austin, Chia, 2023. 5 Unique Ways to Use AI in Data Analytics.

<https://www.datacamp.com/blog/unique-ways-to-use-ai-in-data-analytics>

Balyuk, Anna. 25.3.2024. AI in Project Management: Is the Future Already Here?

<https://www.epicflow.com/blog/ai-in-project-management-is-the-future-already-here/#:~:text=According%20to%20Gartner%2C%20by%202030,AI%2Ddriven%20project%20management%20software.>

Bloch M, Blumberg M, Sven and Laartz Jürgen (October 2012): Delivering large-scale IT projects on time, on budget, and on value.

<https://www.mckinsey.com/capabilities/mckinsey-digital/our-insights/delivering-large-scale-it-projects-on-time-on-budget-and-on-value#/>

Bernard, Marr. 2016. What Is the Difference Between Artificial Intelligence and Machine Learning? <https://www.forbes.com/sites/bernardmarr/2016/12/06/what-is-the-difference-between-artificial-intelligence-and-machine-learning/?sh=d200a582742b>

<https://www.forbes.com/sites/bernardmarr/2016/12/06/what-is-the-difference-between-artificial-intelligence-and-machine-learning/?sh=d200a582742b>

Blumberg ET all. 2024. What is AI (artificial intelligence)?

<https://www.mckinsey.com/featured-insights/mckinsey-explainers/what-is-ai#/>

Bourdreau, Paul. 5.10.2021. The Self-Driving Project: Using Artificial Intelligence to Deliver Project Success.

- Combs, V. 2021. Gartner: AI is moving fast and will be ready for prime time sooner than you think. TechRepublic. <https://www.techrepublic.com/article/gartner-ai-is-moving-fast-and-will-be-ready-forprime-time-sooner-than-you-think/>.
- Costello, Katie, Gartner 2019 -<https://www.gartner.com/en/newsroom/press-releases/2019-03-20-gartner-says-80-percent-of-today-s-project-management>
- Cubric, Marija v. April 2020: Drivers, barriers, and social considerations for AI adoption in business and management: A tertiary study. <https://www.sciencedirect.com/science/article/abs/pii/S0160791X19307171?via%3Dihub>
- Dacre, N. & Kockum, F. (2022). Artificial Intelligence in Project Management. <https://www.apm.org.uk/resources/research/research-fund/artificial-intelligence-in-project-management/>
- Hirsjärvi, S. & Hurme, H. 2001. Tutkimushaastattelu: Teemahaastattelun teoria ja käytäntö. Helsinki: Tammi.
- Kühl & Schemmer et all. Artificial intelligence and machine learning <https://link.springer.com/article/10.1007/s12525-022-00598-0>
- Ojasalo, K., Moilanen, T. & Ritalahti, J. 2015. Kehittämistyön menetelmät – Uudenlaista osaamista liiketoimintaan. Sanoma Pro Oy. Helsinki.
- Lahdenperä, Emilia 12.4.2024. Näkökulmia tekoälyn hyödyntämiseen opinnäytetyössä. <https://arena.jamk.fi/fi/arena-pro/nakokulmia-tekoalyn-hyodyntamiseen-opinnaytetyossa/>
- Lahmann, Mark. 2018. AI will transform Project Management. Are you ready? <https://www.pwc.ch/en/insights/risk/ai-will-transform-project-management-are-you-ready.html>
- Lee, Kai-Fu, and Chen Qiufan (2021): AI 2041 - Ten Visions for Our Future https://www.google.fi/books/edition/AI_2041/tUASEAAAQBAJ?hl=en&gbpv=1&printsec=frontcover
- Marr, Bernard.2021. What is Weak (Narrow) AI? Here Are 8 Practical Examples <https://www.linkedin.com/pulse/what-weak-narrow-ai-here-8-practical-examples-bernard-marr/>

Munir, Maria (2019): How Artificial Intelligence can help Project Managers:

<https://journalofbusiness.org/index.php/GJMBR/article/view/2728/2629>

Nieto-Rodriguez, A & Viana-Vargas, R (2023): How AI will Transform Project Management:

<https://hbr.org/2023/02/how-ai-will-transform-project-management>

Projectmanager, n.d. <https://www.projectmanager.com/guides/it-project-management>

Shakoor et al., 2019 Data quality and standard.

Talmage – Rostron, Mark: January 10, 2024

[How Will Artificial Intelligence Affect Jobs 2024-2030](#)

Vilkka, Hanna. 2021, Tutki ja kehitä. Santalahti Kustannus

Vilkka, Hanna 2007. Tutki ja mittaa. Jyväskylä: Gummerus Kirjapaino Oy.

Wells, Rachel, 2023. AI Tools Every Project Manager Needs In 2024.

<https://www.forbes.com/sites/rachelwells/2023/11/22/8-ai-tools-every-project-manager-needs-in-2024/>

Appendix 1.

Interview form

Thank you beforehand about participating to my artificial intelligence in IT project management diploma work research. During the interview session we will discuss about following theme questions.

3) How long you have worked in IT –project management:

- Between 5-15 years
- Between 15- 25 years
- Over 25 years

4) Are you Part of company top management or Business Owner?

Yes

No

Research questions:

5) Have you used AI in your work as an IT- project manager? If not, why not?

Where have you used AI? Do you find it has helped you in your day-to-day project management?
How have you used AI? What value AI could bring to you when managing IT –projects?

6) What challenges have you faced in using AI? What positive things have you found in using AI in your project work? How can we use AI to find critical tasks in a project? Tell examples if possible.

Can AI be used to lower project costs and reduce waste of time and money in IT –project management?

7) What kind of role project data acting when trying to get more out of using AI?

What is good data quality in AI when talking about project management data?

What kind of challenges you have faced when trying to use AI and data quality is not good.

Appendix 2.

Improving the quality of project management data form - Here are some strategies to achieve this:

1. Standardize Data Collection	<ul style="list-style-type: none"> • Establish clear guidelines for collecting project data. Ensure consistency in terminology, units, and formats across different teams and projects. • Use standardized templates for project documentation, including project plans, status reports, and risk assessments.
2. Automate Data Entry	<ul style="list-style-type: none"> • Manual data entry can introduce errors. Implement tools or systems that automate data capture whenever possible. • For example, integrate project management software with other tools (e.g., time tracking, resource allocation) to reduce manual input.
3. Validate and Clean Data Regularly	<ul style="list-style-type: none"> • Regularly validate data for accuracy and completeness. Identify and correct any discrepancies promptly. • Remove duplicate entries and address missing or inconsistent information.
4. Implement Data Governance	<ul style="list-style-type: none"> • Establish data governance policies and procedures. Define roles and responsibilities for data management. • Ensure that data ownership is clear, and designate stewards responsible for maintaining data quality.
5. Train Project Teams	<ul style="list-style-type: none"> • Educate project managers and team members on the importance of data quality. • Provide training on data entry best practices, emphasizing accuracy and completeness
6. Use Data Quality Metrics	<ul style="list-style-type: none"> • Define key performance indicators (KPIs) related to data quality. Monitor these metrics regularly. • Examples of data quality metrics include completeness, accuracy, timeliness, and consistency.
7. Leverage Technology	<ul style="list-style-type: none"> • Invest in tools that validate data during input (e.g., data validation rules, drop-down menus). • Use data profiling tools to identify anomalies and patterns.
8. Document Assumptions and Constraints	<ul style="list-style-type: none"> • Clearly document any assumptions made during data collection or analysis. • Note any constraints or limitations that

	may affect data quality.
9. Encourage Collaboration	<ul style="list-style-type: none">• Foster collaboration among project teams, data analysts, and IT professionals.• Regularly review data quality issues and seek input from stakeholders.
10. Monitor Data Changes	<ul style="list-style-type: none">• Track changes to project data over time. Implement version control if applicable.• Understand when and why data was modified.