



UNIVERSITY OF PIRAEUS - DEPARTMENT OF INFORMATICS

**MSc «Digital Culture, Smart Cities, IoT
and Advanced Digital Technologies»**

MSc Thesis

Thesis Title:	A Meta Analysis of the effects of AI on Project Management. Μετα-ανάλυση των επιπτώσεων της Τεχνητής Νοημοσύνης στη Διαχείριση Έργων.
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Acknowledgements

Thank you to my advisor, Dr Dimitrios D. Vergados, for providing guidance and feedback throughout this project. Thanks also to my parents Stavros and Julie, for setting me off on this road, and for providing guidance and unconditional support.

November 2023

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Abstract

This Thesis aims to examine the role of Artificial Intelligence on Project Management. Project Management is an extremely essential part of any organization, and it stands to greatly benefit from the advancements in Artificial Intelligence in recent years. By collecting and processing data from a relatively considerable number of publications, I aim to offer some insight into how exactly AI is going to affect project Management in the upcoming years along with listing some of the challenges that the implementation of this technology faces.

Key Words: Artificial Intelligence, Machine Learning, Project Management, Agile Methodology, Scrum, Meta Analysis

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Abbreviations

AI	Artificial Intelligence
ML	Machine Learning
PM	Project Manager
SAFe	Scaled Agile Framework
NLP	Natural Language Processing

Introduction

In recent years, the integration of Artificial Intelligence (AI) in various industries has significantly transformed business processes and operations. With its ability to automate tasks, analyze data, and provide valuable insights, AI is revolutionizing how projects are planned, executed, and monitored. This thesis explores the effects of AI and ML on project management, highlighting its benefits, challenges, and potential future developments.

The automation of tasks, intelligent data analysis, and predictive capabilities contribute to improved project efficiency, decision-making, and risk management. However, organizations must address challenges related to data management, human collaboration, and ethical considerations.

The future of AI in project management holds great potential for further advancements, with technologies like NLP and predictive analytics expected to enhance communication, collaboration, and decision-making. As organizations embrace AI in Project Management, they can gain a competitive edge by leveraging data-driven insights, optimizing resource allocation, and improving project outcomes.

Chapter 1

1. Background and Relevant Definitions

1.1. Artificial Intelligence

Artificial Intelligence (AI) is a field of computer science that focuses on creating intelligent machines capable of carrying out activities that traditionally call for human intellect. It entails creating algorithms and systems that can analyze data, reason, see trends, come to conclusions, and address issues. AI has the ability to automate time-consuming and repetitive jobs, freeing up human attention for more strategic and complicated work. Organizations may improve productivity, simplify processes, and boost efficiency by using AI technology. AI is also capable of swiftly and effectively analyzing enormous volumes of data to uncover insightful trends that may be difficult for humans to see. Businesses may make data-driven choices, find undiscovered patterns, and gain a competitive advantage in a variety of sectors because of this data analytic capacity. AI has the ability to facilitate better decision-making. AI systems can analyze complicated information, assess many criteria, and provide suggestions or predictions based on existing data by applying sophisticated algorithms and machine learning methods. Making wise judgments and achieving the best results are made possible by this.

AI has applications in fields such as healthcare, finance, transportation, manufacturing, and more, where it can enhance safety, accuracy, and efficiency. For example, AI-powered medical diagnostic systems can analyze patient data and provide accurate assessments, aiding in early disease detection and treatment planning.

1.2. Machine Learning

Machine Learning (ML) is a branch of Artificial Intelligence (AI) that focuses on the development of algorithms and models capable of learning from data and making predictions or decisions without explicit programming. ML enables the analysis of large volumes of data, uncovering patterns and insights that may not be easily discernible to humans. This ability is particularly beneficial in domains where data-driven decision-making is crucial, such as finance and healthcare.

ML facilitates automation and efficiency by automating tasks that would typically require human intervention. By training algorithms on historical data, ML models can perform complex tasks, make predictions, and classifications at a faster pace, leading to reduced manual effort and improved

operational efficiency. ML also powers personalized recommendation systems, where algorithms analyze user behavior and preferences to offer tailored suggestions. This enhances user experiences and engagement across various platforms, including e-commerce, streaming services, and social media.

Furthermore, ML enables predictive analytics and forecasting by training models on historical data. This capability is valuable in fields like sales forecasting, demand planning, inventory management, and risk assessment, empowering organizations to make informed decisions and plan effectively.

ML techniques also play a crucial role in natural language processing and speech recognition. These technologies enable machines to understand and interpret human language, paving the way for applications such as virtual assistants, chatbots, and voice-controlled devices.

Machine Learning has revolutionized numerous industries by offering advanced data analysis, task automation, personalized experiences, predictive capabilities, and improved decision-making. Its flexibility and aptitude for handling complex tasks based on data make it a powerful tool in the era of big data and AI.

1.3. Project Management

Project management is a discipline focused on planning, organizing, and controlling resources to achieve specific goals within a defined timeframe and budget. It involves the application of knowledge, skills, tools, and techniques to effectively execute projects.

The usefulness of project management can be attributed to several reasons. Firstly, it ensures that projects have clear and well-defined objectives, keeping the project team focused on achieving those objectives and increasing the chances of success. Secondly, project management facilitates the development of comprehensive project plans, including task definitions, resource allocations, and timelines, promoting effective planning and organization.

Through monitoring project progress, tracking performance indicators, and evaluating outcomes against established metrics, project management enables effective performance monitoring. It helps identify areas for improvement, supports informed decision-making, and allows for timely corrective actions.

Project management brings structure, control, and clarity to complex endeavors. It promotes efficiency, risk mitigation, and improved project performance, making it an indispensable discipline across industries and sectors.

1.3.1. Agile Methodology

The Agile project management methodology is an iterative and incremental approach to managing projects that emphasizes flexibility, collaboration, continuous improvement, and delivering high-quality products or services. Agile methodologies are often used in software development projects but are also useful in many other sectors.

1.3.2. Agile Frameworks

Several Agile frameworks exist, with Scrum being one of the most widely adopted. Scrum provides a structured approach to Agile project management, incorporating roles (such as Scrum Master, Development Team, and Product Owner), ceremonies (such as daily stand-ups and sprint reviews), and artifacts (such as product backlogs and sprint backlogs).

Other Agile frameworks include Kanban, Lean, Extreme Programming (XP), and Dynamic Systems Development Method (DSDM), each offering its own set of practices and guidelines to manage projects in an Agile manner.

Overall, the Agile project management methodology promotes adaptability, collaboration, and iterative progress, enabling teams to deliver high-quality products or services efficiently while responding effectively to changing requirements and customer needs.

Chapter 2

2. Methodology

To review the findings of earlier research, a review protocol was established. As the scope of this Thesis is exceptionally large, I narrowed down the parameters of the search for papers and publications to a 5-year range (2018-2023).

To find papers about (Artificial Intelligence OR Machine Learning) AND (Project Management), I searched four formal databases (Springer, ACM Digital Library, ScienceDirect, IEEE Xplore, and JSTOR) as well as two engines (Google Scholar and ResearchGate). Database searches revealed and manually retrieved a total of 10031 papers, including 223 from Springer, 142 from ACM DL, 1481 from ScienceDirect, 3980 from IEEE Xplore, and 4205 from JSTOR. As Google Scholar and ResearchGate searches returned a large number of publications, not all the query results from those 2 engines could be retrieved and examined. Only peer-reviewed publications -In English- were chosen. After the initial screening of the research, I narrowed down the papers that were actually relevant to this thesis to 272. After a careful and more thorough reading of the material a second filtering of the papers occurred based on duplicate publications and repeating ideas, and I concluded using 55 papers for this meta-analysis.

Records were first screened based on title, then in a subsequent step, based on abstract. 55 articles have been chosen after all the screenings, and data has been gathered from these publications. The presentation of the findings was organized around the themes that emerged from this sample of publications. Moreover, the results were split into 2 groups; papers that evaluated existing project management techniques, and papers that proposed a novel approach (as shown in Figure 1 below,). Finally, the results were categorized by industry as shown in the bar chart below (Figure 2).

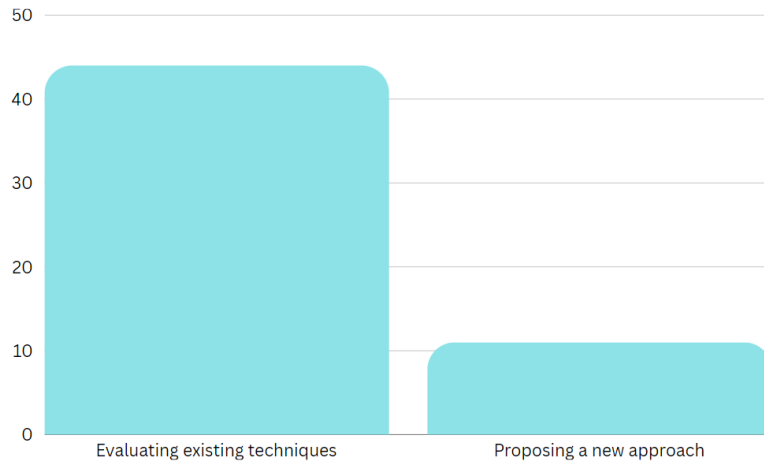


Figure 1. Results from Meta-Analysis 1

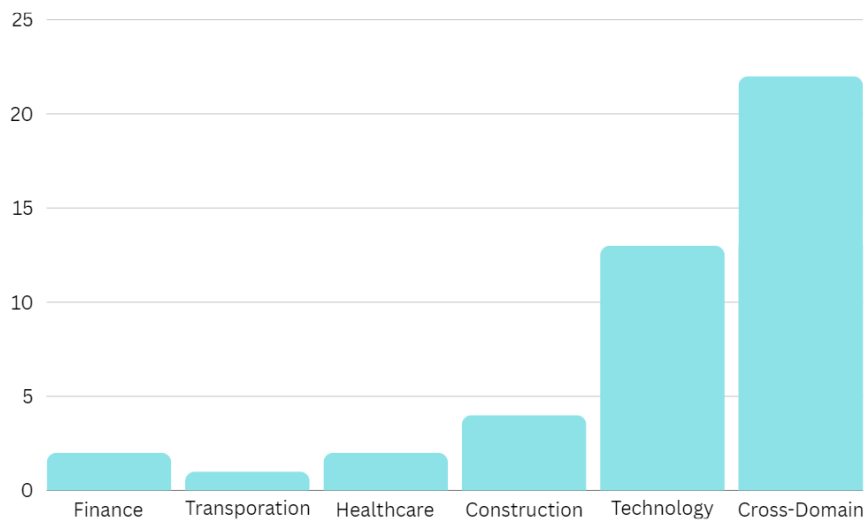


Figure 2. Results from Meta-Analysis 2

Chapter 3

3. AI in Industry

The papers were categorized and grouped based on how AI can affect change in a specific Industry.

3.1. AI in Finance/Banking/Investment Projects

This sector's top goal is the customer experience. The core of the industry's digital revolution will be artificial intelligence (AI) chatbots for individualized customer experiences and quick responses, robotic process automation (RPA), machine learning, voice recognition, and natural language processing (NLP).

The application of AI in risk testing, data analysis, documentary processing, and other back-office supporting functions can easily replace the extensive amounts of highly repetitive work required by the financial industry [50].

Analysts and experts predict that by 2030, AI will save the banking industry close to \$1 trillion. In 32% of the participating banks in Narrative Science's 2018 survey [50], predictive analytics, recommendation engines, voice recognition, and response times are already in use.

3.2. AI in Transportation

Using AI in the transportation industry helps the industry lower expenses overall, improve passenger safety, decrease accidents and traffic jams, and cut carbon emissions [31].

One of the most inventive applications of AI is computer vision, the forerunner of autonomous navigation. By 2023, the worldwide market for AI in transportation, per research, would be worth \$3.5 billion [18]. Autonomous cars have already been used in the real world by companies like Tesla and even Uber. This technology could make it easier to distribute goods. One example is the Tesla semi-truck. AI technologies enable the safety measures on this car. Future iterations of this technology will

be so advanced that people will not even need to operate them; they will simply need to supervise the AI. The transportation industry is experiencing significant problems with capacity, reliability, environmental pollution, and energy waste, which is creating new potential for AI innovation [31].

AI might also be used in the aviation sector to solve issues like flight delays.

The industry can provide clients with good service by lowering wait times and enhancing their travel experiences by evaluating real-time flight data, historical flight records, and weather data. By utilizing data lakes (data repositories) and computer vision, this is made feasible. By learning crucial information about the factors that contribute to flight delays and cancellations, the aviation industry may gain from this knowledge.

3.3. AI in Healthcare

The healthcare sector as a whole has accumulated precise and pertinent patient data. As a consequence, AI and the abundance of data in the healthcare sector are a perfect combination. AI can make the interpretation of scan data simpler by using picture recognition. Since AI analyses many scans considerably quicker than humans can, it has already been utilized to assist physicians in diagnosing symptoms much more quickly. Medical professionals still need to oversee AI to prevent misdiagnoses even if it has increased the accuracy of diagnosis.

AI is used in the healthcare industry for a variety of purposes. By 2023, healthcare spending is anticipated to be reduced by 25% thanks to predictive analytics [51]. By using more proactive rather than reactive methods, AI may completely transform the way healthcare is now provided.

A patient's chance of defaulting on a debt will be precisely predicted by AI by 2020 by looking at their financial history. Because of this, AI may decide which patients to treat depending on their insurance.

3.4. AI in Construction

The construction sector might undergo a transformation thanks to artificial intelligence (AI), which can improve productivity, security, and decision-making. AI can keep an eye on building sites using IoT sensors and computer vision technologies. It can see possible safety risks immediately, such employees operating without the required safety equipment, hazardous working circumstances, or unapproved persons present.

By evaluating data and producing optimum designs, AI can help architects and engineers in the early phases of a building project. To develop effective and sustainable designs, it may assess several elements including building regulations, environmental considerations, and structural integrity [18]. AI may also mimic various situations, assisting in problem-solving and streamlining building schedules.

When AI is integrated with smart building technologies, finished buildings operate more efficiently. It can automate maintenance procedures, monitor equipment performance, and optimize energy use. AI can manage heating, cooling, and lighting by analyzing occupancy patterns and sensor data, which results in energy savings and increased sustainability.

3.5. AI in Tech (Software Development)

Project managers in the IT sector may benefit substantially from AI and Agile software development approaches by increasing productivity, strengthening decision-making, and enabling communication.

In order to help project managers with resource planning and allocation, AI can examine past project data, team performance indicators, and individual skill sets. AI algorithms may provide insights and suggestions for improving resource allocation, ensuring that the appropriate people are allocated to the right tasks at the right time by taking into account criteria like team availability, workload, and skill needs.

To provide precise forecasts and projections, AI can examine data from prior projects, including timetables, prices, and performance measures. These insights may be used by project managers to establish reasonable project objectives, make more accurate time and cost estimates, and anticipate possible hazards and bottlenecks. This supports decision-making and plan adaptation by project managers using data-driven insights.

Agile development approaches like Scrum and Kanban emphasize incremental and iterative development. Project management systems with AI capabilities can automate team communication, task tracking, and progress monitoring. These technologies provide real-time insight into project status, allowing project managers to monitor development, spot problems, and make necessary plan adjustments. In Agile teams, AI may also spot dependencies, provide reports automatically, and improve communication.

To aid project managers in work prioritizing, AI algorithms can examine project requirements, dependencies, and priorities. AI may assist project managers in determining the most significant and time-sensitive activities by taking into account variables including project deadlines, critical path analysis, and resource availability. Teams are guaranteed to concentrate on high-priority tasks as a result, increasing productivity and project success.

In software development projects, AI may assist project managers in identifying and reducing risks. Artificial intelligence (AI) algorithms are able to forecast possible dangers and suggest mitigating measures by examining historical data, project characteristics, and external influences. These insights may be used by project managers to create backup plans, allocate resources wisely, and proactively deal with possible hazards before they turn into significant problems.

AI may aid in decision-making for project managers by examining different project-related facts. For instance, AI systems might examine market trends, competitive information, and consumer input to provide insights about product features or design choices. This assists project managers in making data-driven choices, enhancing the alignment of products with customer demands, and lowering the likelihood of making subjective judgments.

AI-powered collaboration solutions may help team members communicate and work together more effectively. Artificial intelligence (AI) chatbots may respond quickly to frequent queries, freeing up project managers' time for other important responsibilities. Agile team collaboration is streamlined by AI-powered virtual assistants that can arrange meetings, send out reminders, and help with team communication.

Project managers may improve decision-making, foster teamwork, and expedite project management procedures by combining AI technology with Agile software development approaches. A potent synergy may be created between Agile's iterative and collaborative methodology and AI's predictive skills, data analysis, and automation to enable effective project delivery in the tech sector.

Chapter 4

4. How AI can benefit Project Management

Artificial Intelligence can enhance Project Management in multiple ways. This chapter aims to break down the different areas where AI can affect Project Management positively (and compare them to an extent). Below is a graph highlighting said areas taken from S. Elrajoubi “Artificial Intelligence in Project Management” 2019 [54].

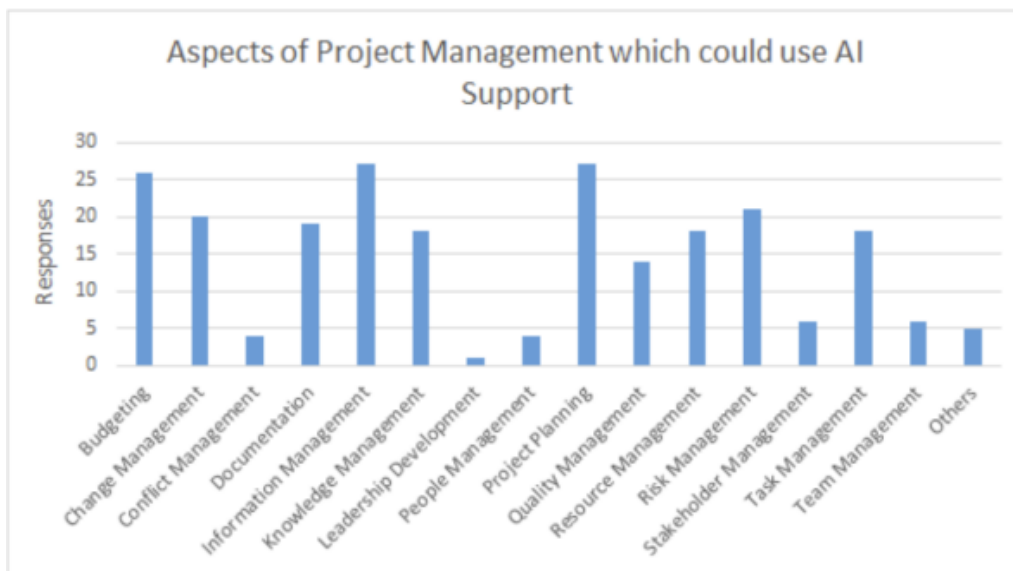


Figure 3. Aspects of Project Management

This chapter is going to explain in depth how Project Management is going to be positively affected by advancements in Artificial Intelligence, and to what extent.

4.1. Agile Methodologies

An AI-based Agile project assistant may help with Agile project management and can raise the success rate of projects. The analytics engine, the planning engine, and the optimization engine are the foundation of this AI system. To learn and produce project data representations that are simple to handle mathematically and computationally, these machines depend on the learning representation

engine. This shows that the system is designed to accept unstructured, raw data from real-world projects and transform it into usable form so that it can be sent to the algorithms that will increase the project's economic worth. The product owner who is in charge of the backlog and items tracking will have less work to accomplish since the system will be able to sort and prioritize things. The system may enhance the "Why" (Descriptive analytics), the "When" (Predictive analytics), and the "What" (Prescriptive analytics) of an event using NLP (Natural Language Processing) as its core technology and other machine learning and deep learning approaches. Prescriptive Analytics then makes recommendations for agile teams in a given circumstance based on descriptive and predictive analysis. The integration of such a system with current project management is not straightforward. However, this system could be able to manage a lot of the administrative and crucial elements of a project.

4.2. Budgeting

By leveraging machine learning algorithms, AI can make accurate predictions about future budget requirements, helping project managers allocate funds more effectively and avoid cost overruns. AI-powered systems can monitor project expenses and financial data in real time. They can automatically collect data from various sources, such as expense reports, invoices, and timesheets, and provide instant updates on the project's financial status. This allows project managers to have a clear and up-to-date view of the budget and make timely decisions to ensure financial objectives are met.

By examining historical spending patterns, resource utilization rates, and vendor performance, AI systems can provide insights into potential cost-cutting opportunities. This information can help project managers optimize budget allocation, negotiate better deals with suppliers, and identify areas of inefficiency that can be improved.

AI can also help project managers assess and mitigate financial risks associated with budgeting. By analyzing historical project data and external factors, AI systems can identify potential risks that may impact the project's budget. This allows project managers to proactively address these risks, adjust the budget accordingly, and implement risk mitigation strategies to minimize financial impact.

4.3. Change Management

AI may assist project managers in managing change by providing insights, streamlining communication, and helping decision-making processes.

By examining the likely effects of a change, AI may also help project managers grasp the scope and impact of a change, identify potential hazards, and effectively design mitigation options.

Project data from the past may be examined by AI algorithms to identify patterns and trends in change management. With the use of this data, AI can predict the likelihood of change requests, identify potential points of resistance or difficulty, and calculate the impact on project budgets and timelines. These insights might help project managers make informed decisions and prepare for change.

AI may help project managers make wise choices by analyzing how well change proposals align with the project's objectives, their feasibility, and their potential repercussions. By accounting for factors like resource availability, dependencies, and project constraints, AI algorithms may provide insights into the viability and potential implications of a change request. This makes it easier for project managers to decide whether to accept or reject modifications based on facts.

The adoption of AI-powered solutions allows project managers to track and evaluate the effectiveness of alterations made. By employing AI algorithms to analyze data from project metrics, user feedback, and performance indicators, it is possible to identify a change's success and potential improvement areas. By refining the change management process, project managers may utilize this to enhance future change implementations.

4.4. Conflict Management

By giving insights, enhancing communication, and encouraging conflict resolution techniques, AI may assist project managers in managing disputes.

Project-related data, including communication logs, task distributions, and performance metrics, may be examined by AI algorithms to spot trends and possible conflict zones. Through the study of this data, AI may be able to provide project managers with analytical insight into the root causes of disputes, enabling them to comprehend the dynamics and take preventative action to resolve them. Chatbots and virtual assistants powered by AI might improve communication and provide solutions for settling conflicts. By assisting team members in communicating their issues, offering unbiased opinions, and recommending conflict-resolution techniques, these AI-powered assistants might serve as mediators. Additionally, they might direct team members to the proper laws or regulations or provide tools for resolving conflicts.

AI can help project managers make decisions in complicated disputes where many elements must be taken into account. AI algorithms may assist project managers in weighing the benefits and drawbacks of different dispute resolution techniques by evaluating a variety of factors, stakeholder

preferences, and prospective outcomes. Project managers may choose the best course of action by using AI-generated insights to inform their decision-making.

AI can forecast probable future disputes by looking at project features and data from previous conflicts. AI may provide project managers with early warnings and suggestions for preventative steps by spotting trends and risk indicators. This aids in project managers' ability to foresee potential problems, put mitigation plans into place, and promote a pleasant and cooperative work environment.

4.5. Documentation

The capacity of AI to automate certain tasks, raise accuracy, and boost the effectiveness of the documentation process may be advantageous to project managers.

The production of project documentation may be automated with the help of AI-powered technologies. AI algorithms may automatically generate reports, project summaries, meeting minutes, and other documentation by examining project data, milestones, and deliverables. Project managers may concentrate on activities with greater economic value as a result of the time savings. Emails, chat logs, project files, and other sources of information may all be used by AI to extract and organize crucial data. Project managers would find it simpler to search for and retrieve information if Natural Language Processing (NLP) tools were used to help AI comprehend and categorize text data.

The search and retrieval capabilities of document management systems may be improved by AI. AI systems may provide more precise and relevant search results by taking into account document content, metadata, and user preferences. Project managers' efficiency and productivity are increased when they can quickly identify certain papers, sections, or pieces of data in a large repository. Project managers may get help translating project papers into several languages using AI-powered language translation technology. Project managers may effectively cooperate and communicate with international teams and stakeholders by using the exact translation abilities provided by AI, which are made possible by NLP and machine translation algorithms.

4.6. Information and Knowledge Management

AI may help project managers manage information and knowledge by automating procedures, organizing data, encouraging knowledge sharing, and producing insights.

Technologies that use artificial intelligence (AI) may automatically gather and compile data from a range of sources, such as emails, documents, databases, and online platforms. AI algorithms can

analyze and categorize data, classifying it into relevant topics, tags, or metadata. Having a central, well-organized, and easily accessible information repository is now feasible for project managers. Unstructured data sources include documents, reports, and conference transcripts, from which AI systems may automatically extract knowledge and insights. Using techniques like text mining and sentiment analysis, AI may identify significant data, trends, or patterns. Project managers may learn confidential information this way and establish wise judgements as a result.

Knowledge management systems with AI capabilities may make it easier for team members to share knowledge. AI algorithms may look at user profiles, interests, and subject-matter expertise to suggest experts or information within the business that is relevant. This encourages collaboration across functional lines and offers project managers access to the team's pooled knowledge.

AI-driven algorithms are able to assess a project's effectiveness and identify its flaws. AI algorithms may analyze project KPIs, team performance, and historical data to recommend ways to streamline processes, lower risks, or allocate resources more effectively. Project managers may utilize these insights to encourage continuing learning and growth in their efforts.

4.7. Project Planning

Artificial intelligence (AI) can forecast a project's success by using predictive analytics. The Evolutionary Project Success Prediction Model (EPSPM) incorporates a variety of AI techniques, such as fuzzy logic (FL) for reasoning, genetic algorithms (GAs) for optimization, and neural networks (NN) for mapping inputs and outputs. A connection exists between EPSPM and the Continuous Assessment of Project Success tool. By selecting a small number of crucial success variables connected to the project life cycle phase, it is a strategy that can be used to any kind of project and helps project teams to anticipate costs.

4.8. Quality Management

A project administration Methodology for Quality Compliance Over 60 customer projects were tracked and managed using PWC [52], and the associated data was gathered and stored for two years. It has several checkpoints that handle various quality compliance areas. The compliance levels of a representative sample of projects were then evaluated using this procedure, which had been automated using AI & RPA in the form of a virtual assistant robot. This project's data could be correctly and efficiently analyzed by the robot, which was also able to assess each project's compliance levels, provide suggestions for raising quality, and changing the scope of future compliance inspections. Additionally, the robot autonomously developed a thorough executive style

dashboard report with all of these insights, and it quickly sent this report to the necessary stakeholders through email and its own interface.

4.9. Resource Management

AI may improve human capital optimization (a new kind of HRMS) by determining the best resource allocation, pinpointing the training required for a particular employee, forecasting resource excess or shortfall, and providing feedback on the project manager's competence and behavior [52]. Project failure is often caused by teams who are unable to grasp and/or carry out a project's core goals and objectives. This might be a technique to prevent that from happening. Given that companies maintain detailed RACIs for their employees, this might theoretically apply to operational allocation as well, rather than just projects.

The ability of AI to manage complex data makes it an obvious advantage for business efficiency. It makes it possible for a computer to keep track of a project's progress and confidently forecast the project's future. Artificial intelligence is able to [] monitor individuals and make predictions based on trends it observes. Artificial intelligence (AI) systems are able to analyze tasks and the actions of specific team members, detecting trends and nuances that would otherwise go unnoticed. They have the ability to monitor budgets and schedules and, with practice, can identify possible repercussions. AI is able to spot circumstances that might cause scheduling issues, and if the timetable is off course, it could suggest other completion dates. ensures that the software can help by providing tailored advice depending on the behaviors that employees have developed. AI systems are capable of recognizing whether someone is acting in a non-compliant manner, which gives them the ability to spot probable fraud cases and other potential problems. One day, these systems may be able to intelligently modify depending on the conflicts caused by a remote worker operating in a different time zone.

4.10. Risk Management

Contrary to traditional project management methods, AI can more accurately predict impending issues based on past data, lowering risk. This encompasses risks involving the project team, vendors, business partners, and other entities. It is feasible to run several scenarios, develop, evaluate, and compare conceivable outcomes while simultaneously assessing cost assumptions and time constraints by fusing project data from the past with project data from the present [53].

These processes seem to be far less susceptible to AI for similar reasons. For instance, although AI can mostly execute the duties of identifying stakeholders and monitoring stakeholder engagement,

planning and managing stakeholder interactions is incomprehensibly difficult for AI to do. Understanding stakeholders' interests, needs, expectations, and issues requires interpersonal abilities, emotional intelligence, active listening, and other human traits that machines cannot replicate. In a similar vein, a machine does not yet possess the skills required to correctly identify consumer demands and engage in scope negotiations with them.

4.11. Task Management

Data input, scheduling, and status reporting are just a few of the routine, repetitive operations that AI-powered solutions may automate. AI may undertake these jobs by using robotic process automation (RPA) or workflow automation, giving project managers more time to devote to more strategic endeavors.

To optimize work assignments, AI algorithms may examine project needs, team competencies, and resource availability. AI can recommend the most effective resource allocation by taking into account elements like expertise, workload, and dependencies. This aids in balancing workloads, reducing bottlenecks, and increasing efficiency for project managers.

Based on the objectives, timelines, and dependencies of the project, AI may provide insights and suggestions for work prioritization. AI systems may identify crucial activities, highlight possible dangers, and suggest priority modifications by evaluating project data. This helps project managers focus on and devote resources to the activities that are most important and urgent.

Project managers may get automatic warnings and messages from AI on approaching deadlines, job dependencies, or changes to the project's status. AI algorithms may proactively alert project managers of anticipated difficulties or important events by examining project data and timetables, making sure nothing gets missed.

AI-powered collaboration tools may help team members coordinate and communicate about tasks. These systems may automate requests for feedback, alerts, and reminders, promoting efficient teamwork and prompt job completion. Project managers can efficiently interact with team members and keep track of work progress.

To give insights into individual and team performance, AI can assess stakeholder satisfaction data, team feedback, and task performance indicators. Project managers may pinpoint problem areas, provide helpful criticism, and enhance work execution procedures by using AI-generated insights.

Chapter 5

5. Challenges

5.1. Security

AI technology may not follow the company's security standards. Depending on the desired output of the project, AI can endanger the safety of human beings.

While AI can enhance security measures, it also presents certain vulnerabilities that need to be addressed.

AI relies on large volumes of data to generate insights and make informed decisions. This data often includes sensitive information about projects, clients, and stakeholders. Proper safeguards must be in place to ensure the privacy and protection of this data. Organizations need to establish robust data governance frameworks, implement encryption protocols, and enforce access controls to prevent unauthorized access or data breaches.

AI systems themselves can become targets of cyber-attacks. Malicious actors may exploit vulnerabilities in AI algorithms, models, or training data to manipulate or compromise project management processes. Adversarial attacks, where malicious inputs are designed to deceive AI systems, can lead to inaccurate decision-making, and compromise the integrity of project data. It is essential to regularly update AI systems, perform security audits, and employ techniques like adversarial training to enhance system resilience against attacks.

AI algorithms are trained on historical data, which may contain biases and discriminatory patterns. When AI is used in project management, these biases can inadvertently affect decision-making, resource allocation, and risk assessment. For instance, biased AI algorithms might favor certain stakeholders or exclude certain groups from opportunities. It is crucial to employ fairness and bias mitigation techniques during the development and training of AI models to ensure equitable project management outcomes.

AI systems can increase the risk of insider threats within project management. Insiders with authorized access to AI systems can manipulate or misuse the technology to gain unauthorized privileges, alter project data, or compromise the integrity of the project management process.

Robust access controls, privileged user monitoring, and regular audits are essential to mitigate insider threats in an AI-enabled project management environment.

AI technology can be weaponized by adversaries to launch sophisticated cyber-attacks. Malware powered by AI can evade traditional security measures, automate attack vectors, and adapt its behavior to bypass defenses. Organizations need to stay ahead of emerging threats, employ AI-based threat detection systems, and continuously update their security infrastructure to protect projects from malicious use of AI.

5.2. Privacy

AI cannot appropriately distinguish between approved and restricted data and violates the right to privacy. This can promote collecting personal data, unauthorized recordings and making unethical decisions.

While AI offers numerous advantages, such as improved decision-making and efficiency, it necessitates the collection, analysis, and utilization of substantial amounts of data.

AI systems require access to vast quantities of data to train models, make predictions, and optimize project management processes. This data may encompass sensitive information about projects, individuals, or organizations involved. The collection and retention of such data increases the risk of potential privacy breaches. It is essential to establish clear guidelines on data collection practices, limit the retention period to what is necessary, and ensure compliance with relevant data protection regulations.

AI systems rely on data to function effectively. Therefore, the security and confidentiality of project data become critical concerns. Breaches or unauthorized access to AI systems could lead to the exposure of sensitive project details, proprietary information, or personally identifiable information (PII). Robust security measures, such as encryption, access controls, and secure data storage, should be implemented to protect project data from unauthorized access or data breaches.

AI algorithms often generate inferences and profiles based on collected data. These inferences can reveal insights about project stakeholders, their behavior, preferences, or patterns. While this information can be valuable for project management purposes, it also raises privacy concerns. Organizations must ensure that the inferences and profiles generated by AI systems

are used responsibly and in compliance with privacy regulations to avoid infringing upon individuals' privacy rights.

In some cases, organizations may utilize third-party AI services or collaborate with external entities to leverage their AI capabilities. This collaboration may involve sharing project data with external parties, potentially raising privacy risks. Organizations should carefully evaluate the privacy policies and practices of third-party AI providers, establish data-sharing agreements, and implement measures to safeguard the confidentiality and integrity of project data shared with external entities.

AI systems should adhere to ethical guidelines and principles to protect privacy. It is crucial to ensure transparency in AI algorithms and decision-making processes, provide clear information about data usage and privacy practices, and obtain informed consent from individuals whose data is being processed. By incorporating privacy by design principles, organizations can prioritize privacy considerations during the development and deployment of AI systems.

To address privacy concerns associated with AI in project management, organizations should adopt a privacy-centric approach. This involves implementing privacy policies and procedures, conducting privacy impact assessments, anonymizing or aggregating data whenever possible, and regularly auditing the AI systems' compliance with privacy regulations. Furthermore, organizations should educate employees about privacy best practices, raise awareness about potential privacy risks, and establish a culture that values and respects privacy rights.

By proactively addressing privacy considerations and integrating privacy safeguards into AI-enabled project management processes, organizations can ensure that the benefits of AI are harnessed while protecting the privacy of individuals and maintaining compliance with relevant privacy laws and regulations.

5.3. Autonomy

People can feel like "slaves" to the computer as AI takes over more and more of the surroundings. After a while, AI develops its own will, which causes Project Managers to get confused about how and when to halt AI.

Although AI may increase project autonomy, there may also be drawbacks that must be taken into account. The following are some ways that utilizing AI might harm a project's autonomy:

The autonomy of a project may suffer from an overreliance on AI systems. The project team's capacity for critical thought and independent judgment may be compromised if it unduly relies on AI to make decisions or carry out tasks. Without enough review or human supervision, relying only on AI suggestions might result in a loss of autonomy and possible mistakes if the AI system is unreliable or makes inaccurate predictions.

Because AI algorithms may be complicated and function as "black boxes," it might be difficult for project team members to understand the justification for suggestions or judgments made by AI. Members of the project team may lose their autonomy if they are unable to dispute or scrutinize the AI's output due to a lack of understanding of the inner workings of AI systems. The lack of transparency may also make it difficult for the project team to grasp how the AI system generates certain insights, perhaps resulting in their blind adoption.

The training data used to create AI systems may include biases or inaccuracies. The AI system may provide biased or erroneous results if the training data is faulty or prejudiced. By fostering or magnifying preexisting biases or adding unexpected mistakes into decision-making processes, this might negatively affect project autonomy. In certain circumstances, the project team may need to overrule or contradict the AI system's outputs, which might hinder autonomy and present new difficulties.

Team members who are unsure of or uncomfortable with the technology may object to the use of AI in project management procedures. The opposition may be motivated by worries about job security, apprehension about AI taking over human tasks, or mistrust of the insights produced by AI. The adoption of autonomous behaviors and the project's capacity to successfully use AI may be hampered if team members oppose or reject the incorporation of AI.

Systems for managing projects using AI may face moral conundrums that limit autonomy. For instance, AI systems may give preference to specific decision-makers or stakeholders based on unspoken prejudices or pre-established regulations. The autonomy of the project may be compromised if these biases run counter to ethical principles like fairness or inclusion by restricting the range of possibilities or preferring specific results.

Organizations may benefit from AI while maintaining project autonomy and assuring the ethical, efficient, and responsible use of AI in project management by carefully addressing these issues and encouraging collaboration between AI and human project team members.

5.4. Employment

It is possible that repetitive and low-skilled occupations are no longer accessible. Due to its lack of interpersonal and social abilities, AI may not be able to delegate a job to the appropriate individual.

Both good and negative consequences on employment inside a project might result from the incorporation of AI in project management. While AI might bring about new possibilities and efficiency, it can also bring about certain difficulties and alter the nature of the labor market. The following are some ways that adopting AI might harm employment in a project:

Certain jobs that were previously carried out by people may be automated by AI technology. As AI systems improve in capability, they may eventually be able to replace manual or routine employment tasks, which would result in job redundancies. Roles like data input, elementary analysis, or ordinary administrative duties may be impacted by this automation. Project team members who are mainly responsible for these duties run the risk of losing their jobs if their responsibilities and skill sets become obsolete.

The skill sets required by the employment market may need to change as a result of the use of AI technology in project management. Project team members may need to learn new skills when AI takes over certain duties in order to stay relevant in the changing labor market. As a result, there can be a skills gap, which might put certain workers at a disadvantage if they cannot get the abilities needed to adjust to the shifting demands. Upskilling and reskilling become essential to minimizing the detrimental effects on employment.

The project's personnel may alter as a result of the use of AI. While new positions relating to the installation, upkeep, or monitoring of AI may develop, certain occupational types may decline or become outdated. It may be necessary for businesses to redistribute resources and clarify job duties as a result of this reorganization, which might result in job losses or changes to the project team's composition.

The use of AI to project management creates moral questions. AI systems may decide or suggest actions that have ethical repercussions, such as prioritizing stakeholders or allocating resources. It may be difficult to strike a balance between moral concerns and guaranteeing fairness and openness in AI-enabled decision-making. If ethical issues are not appropriately handled, it may result in a bad reputation, legal troubles, or other problems, all of which may affect job chances for the project.

Project team members may express concerns and opposition when AI technologies are introduced. Employee morale and productivity may be impacted by a sense of employment uncertainty or fear of job loss. Even if it is not true, the impression that AI may replace human labor might cause resistance and unwillingness to use AI-enabled project management approaches. The effective integration and use of AI in projects may be hampered by this reluctance.

While AI may have an impact on certain work responsibilities, it may also open up new career paths and positions that call for human knowledge, creativity, and problem-solving abilities. To counter the possible detrimental effects on employment, organizations should take a comprehensive strategy that balances the use of AI with workforce planning, skills development, and support systems. The negative consequences may be reduced and a smoother transition in the job market can be facilitated by investing in upskilling and reskilling programs, establishing a culture of continuous learning, and offering support for people in transition.

Chapter 6

6. Conclusions and Future Work

As AI continues to advance, the future of work in project management is poised for significant transformation.

The future will see an increased focus on integrating AI to augment human decision-making processes. AI systems will become more and more self-sufficient and will slowly require less and less input from the user.

Automation powered by AI will play an even more crucial role in streamlining project management processes. Future work will revolve around identifying repetitive and time-consuming tasks that can be automated through AI, such as resource allocation, scheduling, and progress tracking. Organizations will need to invest even more in AI-powered tools and systems that seamlessly integrate with existing project management platforms.

This thesis can be greatly expanded by extending the scope of the research and effectively researching the effects of AI in more industries.

7. Bibliography

References that have not been used in the text to back up statements have been used for general research and are still listed here.

- [1] Srivastava P., Srivastava, N., Agarwal R., Singh P., “Estimation in Agile Software Development Using Artificial Intelligence”, Proceedings of Trends in Electronics and Health Informatics (p.p. 83-930, http://dx.doi.org/10.1007/978-981-16-8826-3_8, March 2022.
- [2] Khaled A.S.D., Sharma D.K., Yashwanth T., “Evaluating the role of Robotics, Machine Learning and Artificial Intelligence in the field of Performance Management”, Proceedings of Second international Conference in Mechanical and Energy Technology : ICMET 2021, India, 2022
- [3] Hsu Y., Chaing Y.H., “The Strategic Advantage of Artificial Intelligence systems for Product Design Teams with Diverse Cross-Domain Knowledge “, Conference paper, HCII 2021: Cross- Cultural Design, Experience and Product Design Across Cultures pp 408 – 419, 2021
- [4] Giraud L., Zaher A., Hernandez S., Ariss, A.A. “Artificial Intelligence and the Evolution of Managerial Skills: An Exploratory Study”, conference paper, I3E 2021: Responsible AI and Analytics for an Ethical and Inclusive Digitized Society, 2021
- [5] Jelonek D., Mesjasz-Lech A., Stepniak C., Turek T., Ziora L., “The Artificial Intelligence Application in the Management of Contemporary Organizations Theoretical Assumptions, Current Practices and Research Review”, Conference paper, FICC 2019 : Advances in Information and Communication pp 319-327, 2019
- [6] Bruhn J., Anderer M., “Implementing Artificial Intelligence in organizations and the special role of trust”, https://doi.org/10.1007/978-3-030-30774-5_14, Springer, 2019
- [7] Kulkarni V., Kolhe A., Kulkarni J., “Intelligent Software Engineering: The Significance of AI techniques in Enhancing Software Development Lifecycle Processes”, Conference paper, ISDA 2021 : Intelligent Systems Design and Applications pp 67 – 82, 2021
- [8] Pinero Perez P., Bello Perez R., Kacprzyk J., “Artificial Intelligence in Project Management and making Decisions”, <https://doi.org/10.1007/978-3-030-97269-1>, Springer 2022.
- [9] Goyal S., Jha H., Gupta A., “Automation in Project Management 4.0 with Artificial Intelligence”, Conference paper, Proceedings of 3rd International Conference on Recent Trends in Machine Learning, IoT, Smart Cities and Applications pp 561-567, 2023

- [10] Camarinha R., Porter D., Quang C., “Disruptive Innovation in AEC: The case of Artificial Intelligence applied to Project Management”, Conference paper, ISIC 2022: trends on Construction in the Digital Era pp 36 – 46, 2022.
- [11] Endo H., Kohda Y., “Case Study on Applicability of Artificial Intelligence for IT Service Project Management with Multi Value Systems in the Digital Transformation Era”, Conference paper, AHFE 2020 : Advances in the Human Side of Service Engineering” pp 278 – 288, 2020.
- [12] Dahmani S., Ben-Ammar O., Jebali A., “Resilient Project Scheduling Using AI: A conceptual framework”, Advances in Production Management Systems, Artificial Intelligence for Sustainable and Resilient Production Systems, Springer International Publishing, 2021
- [13] Yu L., “Project Engineering Management evaluation based on GABP neural network and Artificial Intelligence”, Soft Comput 27, <https://doi.org/10.1007/s00500-023-08133-9>, Springer, 2023
- [14] Otero-Mateo M., Cerezo-Narvaez A., Pastor-Fernandez A., Castilla-Barea M., Ramirez-Pena M., “Stakeholder Management in Technological Projects and the Opportunity of AI: A case study”, Conference paper, DTI2022: Digital Transformation in Industry pp297-318, Springer, 2023.
- [15] Yordanova Z., “Artificial Intelligence in the Innovation Process – Do We Pay Attention to this Participant in Innovative Projects?”, Conference paper, EMCIS 2021: Information Systems pp 427-438, European, Mediterranean, and Middle Eastern Conference on Information Systems, Springer 2021.
- [16] Hassan A., Elrahman M., Ali S., Mohammed N., Abdulkhaleq S., Dahlan M., Shaker G., “Using AI in the management Process”, Conference paper, ICBT 2022: Digitisation : Opportunities and Challenges for Business pp549-557, Springer 2022.
- [17] Wodecki A., “Influence of AI on Activities and Competitiveness of an Organization”, Artificial Intelligence in Value Creation pp133-246, https://doi.org/10.1007/978-3-319-91596-8_3, Springer 2018
- [18] Alrifai K., Obaid T., Abulehia A., Abualrejai H., Nassoura M., “The Role of Artificial Intelligence in Project Performance in Construction Companies in Palestine”, Conference paper, ICISIA 2022: International Conference on Information Systems and Intelligent Applications pp71-82, Springer 2022
- [19] Alserr N., Salepcioglu M., “Success Factors Affecting the Adoption of AI and the Impacts of an Organizational Excellence: A case to be studied in the MENA Region, and in Turkey in particular”, Conference paper, ICBT 2021: Impact of Artificial Intelligence, and the fourth Industrial Revolution on Business Success” pp3-16, Springer 2021
- [20] Wamba S., Queiroz M., Braganza A., “Preface: Artificial Intelligence in Operations Management”, Article, Annals of Operations Research, Springer 2021
- [21] Abdirad H., Mathur P., “Artificial Intelligence for BIM Content Management and Delivery: Case Study of association rule mining for construction detailing”, <https://doi.org/10.1016/j.aei.2021.101414>, Science Direct, 2021

- [22] Egwin C., Alaka H., Tiriola-Coker L., Balogun H., Summola F., “Applied Artificial Intelligence for Predicting Construction Projects Delay”, <https://doi.org/10.1016/j.mlwa.2021.100166>, Science Direct, 2021
- [23] Nagwani N., Suri J., “An AI Framework on Software Bug Triaging, Technological Evolution, and Future Challenges: A Review”, <https://doi.org/10.1016/j.ijime.2022.100153>, Science Direct, 2023.
- [24] Merhi M., “An Evaluation of the Critical Success Factors Impacting AI Implementation
- [25] A Systematic Literature review on the impact of AI on workplace outcomes: A multi-process perspective”, <https://doi.org/10.1016/j.ijinfomgt.2022.102545>, Science Direct, 2023
- [26] Alter S., “Understanding AI in the context of usage: Contributions and Smartness of algorithmic capabilities in work systems”, <https://doi.org/10.1016/j.ijinfomgt.2021.102392>, Science Direct, 2022
- [27] Borges A., Laurindo F., Spinola M., Concalves R., Mattos C., “The Strategic use of AI in the digital era: Systematic literature review and future research directions”, <https://doi.org/10.1016/j.ijinfomgt.2020.102225>, Science Direct, 2021
- [28] Wamba S., “Impact of AI assimilation on firm performance: The mediating effects of organizational agility and customer agility”, <https://doi.org/10.1016/j.ijinfomgt.2022.102544>, Science Direct, 2022.
- [29] Mikael P., Gupta M., “Artificial Intelligence capability: conceptualization, measurement, calibration, and empirical study on its impact on organizational creativity and performance”, <https://doi.org/10.1016/j.im.2021.103434>, Springer 2021.
- [30] Dennehy D., Griva A., Pouloudi N., Mantymaki M., Pappas I., “Artificial Intelligence for decision making and the future of work”, <https://doi.org/10.1016/j.ijinfomgt.2022.102574>, Science Direct, 2023.
- [31] Shi T., Wu J., “Application of AI in Water Conservancy Project Management”, IEEE 2022 International Conference on Computing, Robotics and System Sciences (ICRSS), <https://doi.org/10.1109/ICBASE53849.2021.00109>, 2022
- [32] Alshaikhi A., Khayyat M., “An Investigation into the impact of AI on the Future of Project Management”, 2021 IEEE International Conference of Women in Data Science at Taif University (WiDSTaif), <https://doi.org/10.1109/WiDSTaif52235.2021.9430234>, 2021
- [33] Dam H., Tran T., Grundy J., Chose A., Kamei Y., “Towards effective AI-Powered Agile Project Management”, 2019 IEEE/ACM 41st International Conference on Software Engineering : New Ideas and Emerging Results (ICSE-NIER), <https://doi.org/10.1109/ICSE-NIER.2019.00019>, 2019
- [34] Auth G., Johnk J., Wiecha D., “A conceptual framework for Applying Artificial Intelligence in Project Management”, 2021 IEEE 23rd Conference on Business informatics (CBI), <https://doi.org/10.1109/CBI52690.2021.00027>, 2021
- [35] Koulinas G., Xanthopoulos A., Kiatipis A., Koulouriotis D., “A Summary of Using Reinforcement Learning Strategies for treating project and production management problems”, 2018 Thirteen International Conference on Digital Information Management (ICDIM), <https://doi.org/10.1109/ICDIM.2018.8847099>, 2019

- [36] Marchinaras A., Rodriguez C., "Online Solution Based on Machine Learning for IT Project Management in Software factory companies", 2021 13th International Conference on Computational Intelligence and Communication Networks (CICN), <https://doi.org/10.1109/CICN51697.2021.9574682>, 2021
- [37] Zabil M., Mahdi M., Azmi M., Cheng L., Yusof A., Ahmad A., "Software Project Management Using Machine Learning Technique – A Review", 2020 8th International Conference on Information and Multimedia, <https://doi.org/10.1109/ICIMU49871.2020.9243543>, 2020
- [38] Pang D., Shavarebi K., Ng S., "Development of Machine Learning Models for prediction of IT Projects Cost and Duration", 2022 IEEE 12th Symposium on Computer Applications & Industrial Electronics (ISCAIE), <https://doi.org/10.1109/ISCAIE54458.2022.9794529>, 2022
- [39] Hamada M., Abdallah A., Kasem M., Abokhail M., "Neural Network Estimation Model to Optimize Timing and Schedule of Software Projects", 2021 IEEE International Conference on Smart Information Systems and Technologies (SIST), <https://doi.org/10.1109/SIST50301.2021.9465887>, 2021
- [40] Tan J., Lu Q., "Garden Project Management System Design Based on IoT and GIS Technology", 2022 International Conference on Artificial Intelligence and Crowdsensing (AloTCs), <https://doi.org/10.1109/AloTCs58181.2022.00052>, 2022
- [41] Tashtoush Y., Doulat W., Banat S., Alkhdour N., Darweesh D., Darwish O., "Project Management Effort Estimation Using Agile Manager Game Platform", 2022 13th international Conference on Information and Communication Systems (ICICS), <https://doi.org/10.1109/ICICS55353.2022.9811211>, 2022
- [42] Abousamra R., Hosam O., "Quantitative Classification of Cognitive Behaviours for Industrial Projects' Managers in the MENA Region", 2022 8th International Conference on Information Technology trends (ITT), <https://doi.org/10.1109/ITT56123.2022.9863957>, 2022
- [43] Javed S., Liu A., "Bidirectional Absolute GRAIGIA Model for Uncertain Systems: Application in PM", IEEE Access, <https://doi.org/10.1109/ACCESS.2019.2904632>, 2019
- [44] Tshimula J., Togashi A., "Machine Learning – Based Framework for the Analysis of Project Viability", 2018 IEEE 3rd International Conference on Computer and Communication Systems (ICCCS), <https://doi.org/10.1109/CCOMS.2018.8463271>, 2018
- [45] Nikulina N., Malakhova A., Ivanova I., "Application of Intelligent Technologies in Solving the Innovative Projects Problems", 2019 IEEE XXI International Conference Complex Systems : Control and Modeling Problems (CSCMP), <https://doi.org/10.1109/CSCMP45713.2019.8976870>, 2019
- [46] Weichenhain M., Fengler W., Streitferdt D., "How to bring Project Management of Embedded Systems to an Appropriate level of Abstraction for a Discrete Event Model", 2019 IEEE 43rd Annual Computer and Applications Conference (COMPSAC), <https://doi.org/10.1109/COMPSAC.2019.10202>, 2019

- [47] Nankap L., Bouchard B., Francillette Y., Imbeau G., “Scrum and Remote Work in Video Game Projects: Improving Communication, Trust and Efficiency”, 2022 IEEE Games, Entertainment, Media Conference (GEM), <https://doi.org/10.1109/GEM56474.2022.10017472>, 2022
- [48] Bogdan D., Marginean A., “Predicting Structure & Clarity of Software Projects with Machine Learning”, 2020 IEEE 16th International Conference on Intelligent Computer Communication and processing (ICCP), <http://dx.doi.org/10.1109/ICCP51029.2020.9266211>, 2020
- [49] Costa A., Ramos F., Perkusich M., Neto A., Silva Luiz, Cunha F., Rique T., “A Genetic Algorithm-Based Approach to Support forming Multiple Scrum Project Teams”, IEEE Access, <https://doi.org/10.1109/ACCESS.2022.3186347>, 2022
- [50] Noelle C., “Why AI is the Future of Finance”, <https://www.processmaker.com/blog/why-ai-is-the-future-of-finance/#>
- [51] Saracco R., “The Future of Healthcare is tied to Big Data”, IEEE Future Directions, <https://cmt.ee.org/futuredirections/2018/05/18/the-future-of-health-care-is-tied-to-big-data/>
- [52] PWC, “A Virtual Partnership: How AI will disrupt Project Management and change the role of Project Managers”, <https://www.pwc.com/m1/en/publications/virtual-partnership-artificial-ntelligence-disrupt-project-management-change-role-project-managers.html>, 2019
- [53] PWC, “AI will transform project management. Are you ready ?” <https://www.pwc.ch/en/publications/2019/ai-will-transform-project-management-en2019-web.pdf>, 2019
- [54] Elrajoubi S., “Artificial Intelligence in Project Management”, Academia.edu, https://www.academia.edu/41734485/Artificial_Intelligence_in_Project_Management, 2019
- [55] Dacre N., Kockum F., “Artificial intelligence in project management : A review of AI;s usefulness and future considerations for the project profession”, APM Research Fund Series, 2022