

Planning in Project Management: Human vs Artificial Intelligence-driven

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ARTICLE INFO	ABSTRACT
Article History Received 07 February 2026 Accepted 28 May 2026 <i>JEL Classifications</i> M11, O22 Keywords: project management, ai-driven, human-centric, project planning.	Purpose: This paper presents a comparative case study on project planning using two distinct approaches: the traditional human-driven method and an AI-assisted method. The study utilizes a publicly shared requirements for a software project, with the scope limited to the planning phase of the project. In the first scenario, the planning was performed by an experienced PMP-Certified Project Manager, with over seven years of practice, applying industry best practices, Project Management Body of Knowledge guidelines and professional judgement to create a structured plan. In the second scenario, the same requirements were processed through an AI-driven approach, using ChatGPT as a conversational tool, with results obtained through multiple prompt iterations. The outputs were analyzed comparatively, focusing on differences in structure, completeness, and adaptability of the proposed plans. A SWOT analysis was then conducted to evaluate strengths, weaknesses, opportunities, and threats of both approaches. Findings suggest that while the human-driven approach offers a context-aware prioritization, tailored approach and comprehensive stakeholder integration, the AI-generated plan demonstrates rapid structuring and access to vast knowledge base. This work highlights the complementary potential of combining human expertise with AI support in project planning and accelerate the process, providing a broader perspective. While AI might lack contextual sensitivity and domain-specific prioritization that experienced project managers provide, the human expertise can ensure adaptability and creativity, but may be limited by personal experience or oversight. The study concludes that future project management practices can benefit from hybrid approaches, where AI augments human decision-making that could lead to successful completion of the projects. Design/methodology/approach: In this article it will be presented a proposed study case that will compare a phase in project management created by two different entities: a human professional in the field and in comparison, an AI generative tool (ChatGPT-5 model). The study case was applied on a random search for a public official requirement, and selected the first result returned when searching after Software Requirements Specification. The proposed protocol for the analysis follows Yin R. (2003) recommendations. Based on the explanation from his book, the study case starts with formulating the research question, then selection criteria of the study case, study case questions, delimitation of the study case, collection of the data and the results of the analysis of the data. Findings: The proposed study case question is: “How it is different the planning done by a human compared with an artificial intelligence, in terms of structure, sequencing, logic, time, completeness of the documents proposed, compared with project management best practices?”. The results differ in output size (10 pages and 17 annexes vs 20 pages), tool utilization (different tool vs no tool), time invested (3 days vs 1 hour), proposed deliverables, context relevance (tailored vs general information) and completeness (attached annexes vs enumerated). The findings were provided considering the same input and comparing the output received from both actors, emphasising the idea that the utilization of a generative AI tool enhance and complements the role of the human project manager. Although the project manager human is constrained to his experience, the help of the AI tool can be effective by leveraging extensive knowledge. Research limitations/implications:

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The sample size is small and includes only one human project manager, who is also one of the co-authors. Future research could involve multiple AI tools and a larger number of project managers working with the same requirements, allowing comparison across professionals. In addition, future studies could incorporate external expert reviews to validate plans generated by the human professional. Another proposal to extend this study could also be expanded to include multiple project documents rather than a single case. It can be considered as another limitation that the planning activity was created by a project manager and not by multiple participants with different roles. In companies, the planning typically involves contributions from various roles, such as business analysts for requirement breakdown or development teams for effort estimation. Further limitation concerns are related to the quality of the plan generated by the AI that depends heavily on the prompts provided. Since prompting skills vary with the user's experience, the outputs may differ across individuals. Considering the experience of the person that introduces the prompting, the quality of the result can be different.

Originality/value:

The planification phase can be the most time-consuming and needs extensive project management knowledge. At the same time, there is growing discussion nowadays about AI and its impact on the workplace of project management field. In this study the aim was to search for empirical evidence on whether artificial intelligence can truly replicate expert human reasoning in project management planning. The results were presented between the two actors using narrative analysis, comparative analysis, benchmark analysis and SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis, considering the PMBOK guide as a framework. There were also presented responses to the proposed questions. This case study would likely present different results in six months or in one to two years and it will be interesting to document how the impact of AI is evolving and it is integrated into real life projects.

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1. Introduction

Nowadays, planning a software development project as a project manager, can be approached in the traditional way, incorporating agile, using Artificial Intelligence (AI) tools, or a mixture of methods. Using traditional method usually means that a professional project manager reviews the specifications, split them into milestones employing a work breakdown structure and prepare the big picture for the requirements, typically together with a business analyst. A timed box meeting with the development team is scheduled, where the requirements are analysed and each item is estimated. It is not mandatory that the team involved in the estimation process is the one that will do the actual implementation of the project. Commonly, for a more accurate assessment, the team that perform the evaluation should be formed by both senior and junior software developers. In this meeting, it is also covered the discussion regarding the dependency, in order to identify which item will be blocked by another product backlog entry. Typically, the people involved are splitting the requirements into details and discuss the steps that should be done to accomplish specific functionalities. They estimate based on their experience with the past similar projects. After this meeting, the project manager can create a planification, allocate resources and propose the Gant chart.

This entire process takes time, and the quality of deliverables depends, to a large extend, on the project manager expertise. With the technical advancements, project managers, can use artificial intelligence tools to increase the quality of the planification, to better have a view on the Work Breakdown Structure (WBS) and to accomplish it in a shorter time.

2. Background and related work

According to Rita Mulcahy (2020) project management is a methodical approach to manage the work that needs to be accomplish in order to successfully obtain the proposed goal and to do it in an organized manner.

Over time, there were different ways of working that project managers adopted, including traditional, iterative, adaptive, or a hybrid approaches, according to PMBOK (2017), and nowadays integrated with artificial intelligence. While waterfall is referring to going from a phase to another only after finalizing the previous one and the requirements are well defined in advance (Layton et al., 2020), agile propose a shift in mindset and based on a manifesto created in 2001, the delivery is adaptive and is focusing on providing value and a functional product, accepting changes and clarifications even late in development (Perkin, 2020).

Because the methodology chosen is very important for the success of the project, it is also highlighted in the literature, as there are numerous studies that examine the project management approaches and studies about which approaches work best and are recommended. For instance, Maier and Emmerich (2022) conducted their analysis and conclude that agile methodology helps save time. However, it is mentioned that practitioners in domain should train

with both traditional and adaptive methods and be able to use a hybrid of the two. Moreover, Mishra and Ganesh (2026) compared the same two methods and based on a survey of 100 developers found that agile methodology has less delays in the schedule and a lower cost. In addition, more in-depth, Ly et al. (2025) studied the differences in written communication, with the findings suggesting that agile teams present more collaborative exchanges using unofficial channels. Other study highlights the benefits of transition from waterfall and agile, showing better bug trends, more frequent releases and an increase in automation (Natarajan & Shanmugavadivu, 2024). Another study conducted by Leong et al. (2023) analysed the advantages and disadvantages of combining agile and traditional methodologies, while Mishra and Alzoubi (2023) ending with the idea that there is no methodology that can best fit for all type of projects.

In the latest years, it appeared a growing numbers of studies focused on project management and artificial intelligence. For instance, a search in Web of Science database by “project management” and “artificial intelligence” in topics, filtering by open-access articles in English, shows an increase in the numbers of published articles (in 2025, more than twice as many as in 2024), which highlight the interest in exploring the way how these two fields interact and can create a positive impact.

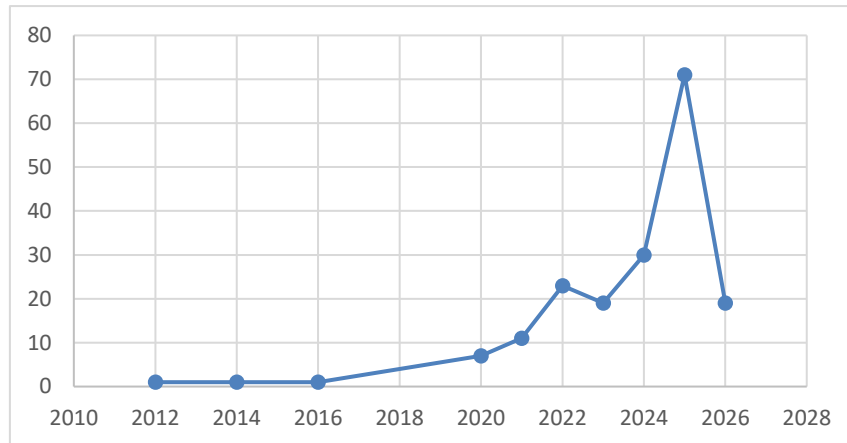


Figure 1: Distribution of articles published by year
(Source: Web of Science)

Some authors studied the impact of artificial intelligence, for instance specific related to costs, risk and scheduling (Fridgeirsson et al. 2023), others discussed about the job’s transformation for practitioners (Mariani & Mancini, 2025) and also the analysis of the gap between junior and senior that can be covered with AI gen tool (Hettrich et al , 2025). Furthermore into the future, Hughes et al. (2025) proposed in their study a framework regarding the ethics and a model for AI adoption for a structured transition to the year 2030. Using specific selected experts from academia and industry, the authors proposed the models based on challenges and possible solution.

Considering the increased interest in using artificial intelligence in management of projects, in the following sections is presented the study case that dive into this topic in more depth and compare how the project planning is done by a generative AI and, and by a human professional in the field.

3. Study case and methodology

In this article it will be presented a proposed study case that will compare a phase in project management (planning phase) created by two different entities: a human professional in the field and in comparison, an AI generative tool (ChatGPT-5 model). Using a qualitative methodology, the analysis is performed on the same set of requirements by both actors involved.

This study specifically aims to identify the main differences between a planification done by a person with more than 7 years’ experience in the project management field and one done automatically by a generative artificial intelligence tool. To narrow the scope, the coverage is only for the planification phase, which is the step that comes after the initiation of the project, and before the execution. The aim is to compare how planning looks like when it is performed in a traditional way and how it looks like when it is done by the machines.

The project was selected random based on initial accessibility and relevance. It was identified through a Google search, after Software Requirements Specifications, where the first result led to an official requirement document. Additional related documents were then collected from official sources, including the Ministry of Finance website and Electronic Public Procurement System (SEAP) platform, to ensure consistency and completeness of information. Regarding project size, it can be considered medium to large in scale, with the value established at 344,448 EURO (1722240 without TVA considering 1 EURO= 5 RON) and an estimated completion time of 18 months. This was a real project where the participation announce was published in April 2022 and the attribution decision was made in January 2024, according to the data available in the SEAP (Electronic Public Procurement System) announcements (SEAP, 2024). Furthermore, on this site was presented amongst the selection criteria, the experience of the project manager that was valuing 5% and the proposed methodology and documentation accounted for 25%, representing in total 30% reference to the value on the project manager’s contribution.

The project involves the development of a software system, more specific, for redesigning, improving and migration of current system already in place. It is a software project in the public sector with a moderate complexity considering involvement of multiple institutional stakeholders and compliance with specific requirements, regarding availability and security. The project was chosen because it was easy to access, public, related to software development and relevant to real-world situations, since it was requested to an existing company and with all the information that come from official sources.

In the presented case study, the recommendations proposed by Yin R. (2003) contain the objectives, field procedures, questions and the report. Following the explanation from his book, this analysis starts with formulating the research question: How it is different the planning done by a human compared with an artificial intelligence, in terms of structure, sequencing, logic, time, completeness of the documents proposed, compared with project management best practices?

Withing this research, the approach was to take a formal public requirement for a software development project and act as a project manager to create the planning part. This was accomplished using two approaches, meaning the human and the artificial ways. This perspectives intends to respond to the research question and as suggested by Yin R. (2003) is a contemporary phenomenon as the release of the artificial intelligence tool (ChatGPT-5 model) was done in November 2022 to the wide public (Marr, 2023) and according to Gartner 80% of the work of the project managers will be replaced by artificial intelligence (Gartner, 2019).

Following Yin R (2003) recommendations, this article follows a set of guiding questions to be addressed. For this specific comparative study, the following four questions were proposed:

1. How is the overall structure of the two proposals?
2. What level of details are proposed by the two parts?
3. Do both actors propose the same documents and deliverables?
4. Does any of the actors have wrong or incomplete information?

This study is limited to a comparative study between two actors: a human professional in the field and artificial intelligence chat tool for an official requirement of a software development project.

Following Yin's protocol, the collection of the data are represented by the open-access documents from the existing requirements, the documentation provided by the project manager professional in the field with over 7 years of experience, and a document provided by prompting with ChatGPT as an artificial intelligence model, based on the same tender. Both documents have identical input conditions, to ensure a better comparability. In both cases, were used the PMBOK (Project Management Body of Knowledge) sixth edition, as benchmark for best practices. The data is shared in this study case in a systematic way and contain documents provided by both human and generated by artificial intelligence, narrative analysis, comparative analysis, benchmark analysis and SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis.

The plan for creating the database is to follow the next steps in this specific order:

1. The human-based approach based on the public tender requirements and documentation of all outputs
2. The prompting with an artificial intelligence tool (chat GPT) and saving the results obtained
3. Narrative analysis conducted based on the two results
4. Comparative analysis performed and gathered in a table for a better overview
5. Benchmark analysis carried out following the best practices provided by the PMBOK
6. SWOT analysis with result shared in a comparative tool

In the analysis of the data within this study case, following Yin's approach, the results are presented, compared and explained where needed. The data is categorized, and each proposal, along with its corresponding outcome, is compared against the PMBOK framework to ensure alignment with established project management standards.

The discussion section presents a synthesis of the findings along with their practical and theoretical implications. In the next imagine, (Figure 2) is presented a visualization of the protocol considering adaptation of Yin, R., K., (2003) books and Moss S. adaptation that was edited in Miro tool.

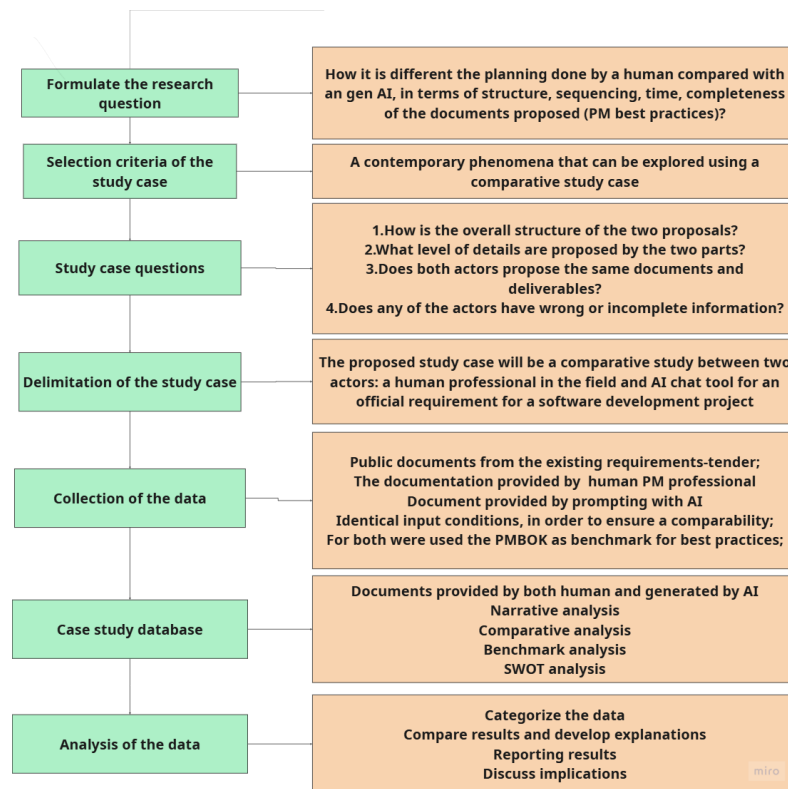


Figure 2: Visualization of the protocol
(Source: Yin, R., K., 2003 book and Moss S. adaptation)

The human approach implies the traditional way of doing the planification for a project, respecting the international standards, specifically following the international guidelines recommended in Project Management Body of Knowledge sixth edition. With a knowledge of over 7 years of experience in project management field, the project manager took the public requirement of the chosen study case and created the plan based on the experience and classical methodology.

The second part of this study consist in the use of an artificial intelligence tool, one of the most popular tools, according to Westfall (2023) from Forbes, chatGPT. The plan was developed by entering a prompt in the chat, that instructed the AI tool to act as a project manager, outline the requirements, and do the planification, same as the human project manager did, enabling a comparison of the results.

In order to evaluate the results of both planification provided by the human and the AI, it was applied a proposed framework based on project planning principles described in PMBOK guide (sixth edition) and Rita Mulchly's work. The evaluation criteria are structured according to the PMBOK knowledge areas. The list of criteria proposed in this framework for evaluation are as follows:

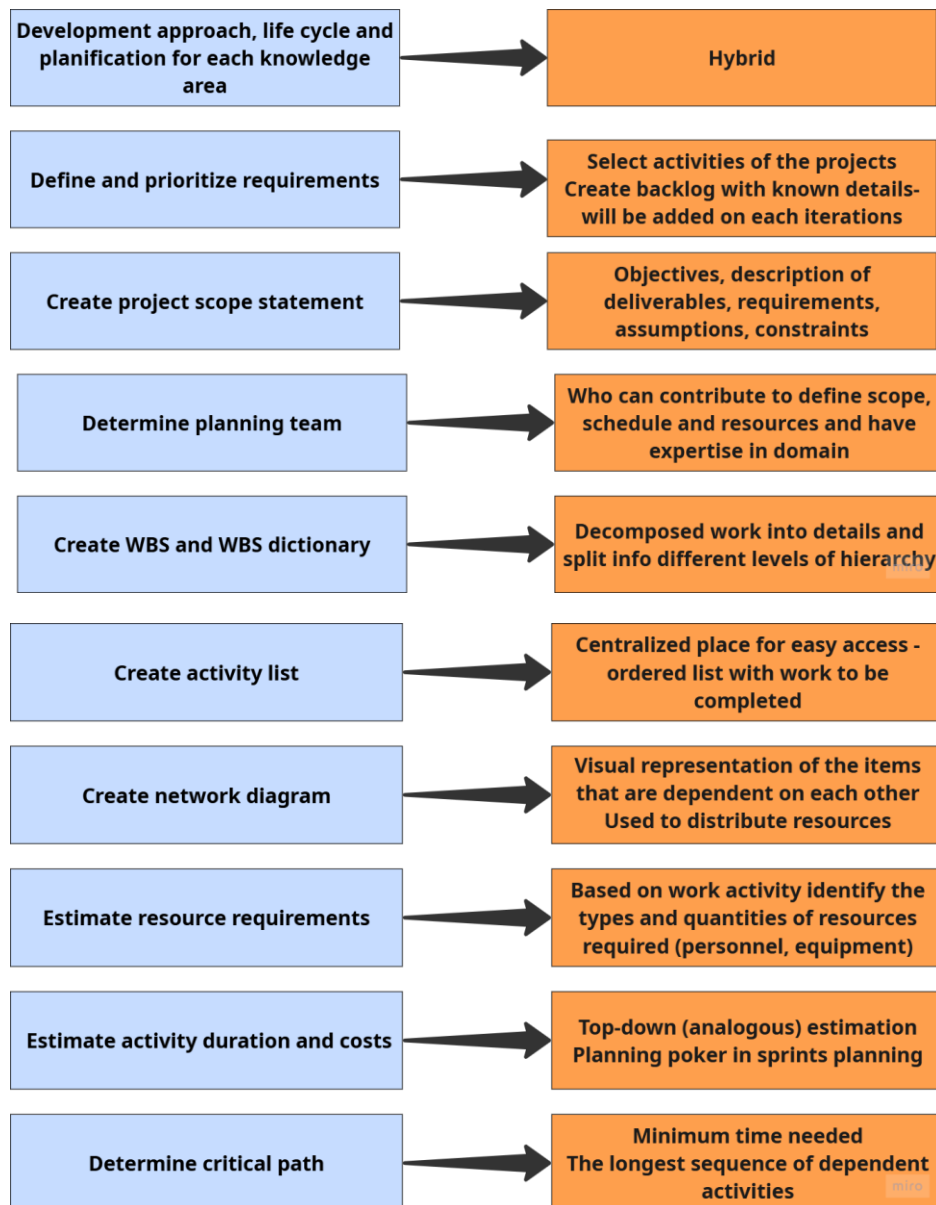
- Scope: level of planning, working methodology, completeness of the list of activities and deliverables, assumptions, constraints, exclusions, acceptance criteria and also the clarity of the breakdown for the proposed tasks in the project
- Schedule: the logical sequencing of activities and the Gantt chart level of detail
- Resources: resource requirements proposals, definition of roles and responsibilities and the breakdown structure
- Risks: identifications and analysis
- Quality: alignment with the proposed standard
- Stakeholders: identification and analysis
- Communication: plan structure and clarity
- Cost: budget details
- Integration: overall level of the integration that was mentioned by the two sided
- Procurement: plan for the procurement, if needed

This framework was applied to both human and artificial intelligence (GenAI) approach and a proposed score was mentioned based on the level of explanation presented by each side, considering the structure and completeness of the task. A scale from 1 to 5 was used for these criteria and are presented in the results section. The lower scale is 1, meaning that it was not addressed or very poorly addressed, then 2 means that it was presented in the proposal, but limited, 3 means that it was detailed but not structured or detailed and 4 means that it was very detailed and presented in a structured manner. The highest point in the scale 5, is meant for the most detailed and complete detail presented.

The scope is to compare both results and see what strengths and weakness has each approach and what can be done to improve for the future project managers.

3.1 Study case phase 1: Human approach

According to Rita Mulcahy (2020) description in her book at processes and domains, there are five phases that a professional project manager needs to go through to complete a project. It starts with initiating phase, continue with the planning process, which has a set order of 25 actions to follow, then it continues with the execution of the project monitoring and controlling, and in the end the closing part of the project. The actions described for the planning part, starts with the decision of the approach considering the development and life cycle of the project, the defining of the requirements, developing the schedule, budget, communication engagement, risk plan and conclude with obtaining the final approval for the planned project. The planning components that were split into smaller backlog items, can be incorporated in a management tool, such as Jira for instance. In the next image (Figure 3.) are illustrated the steps proposed and description for each of them.



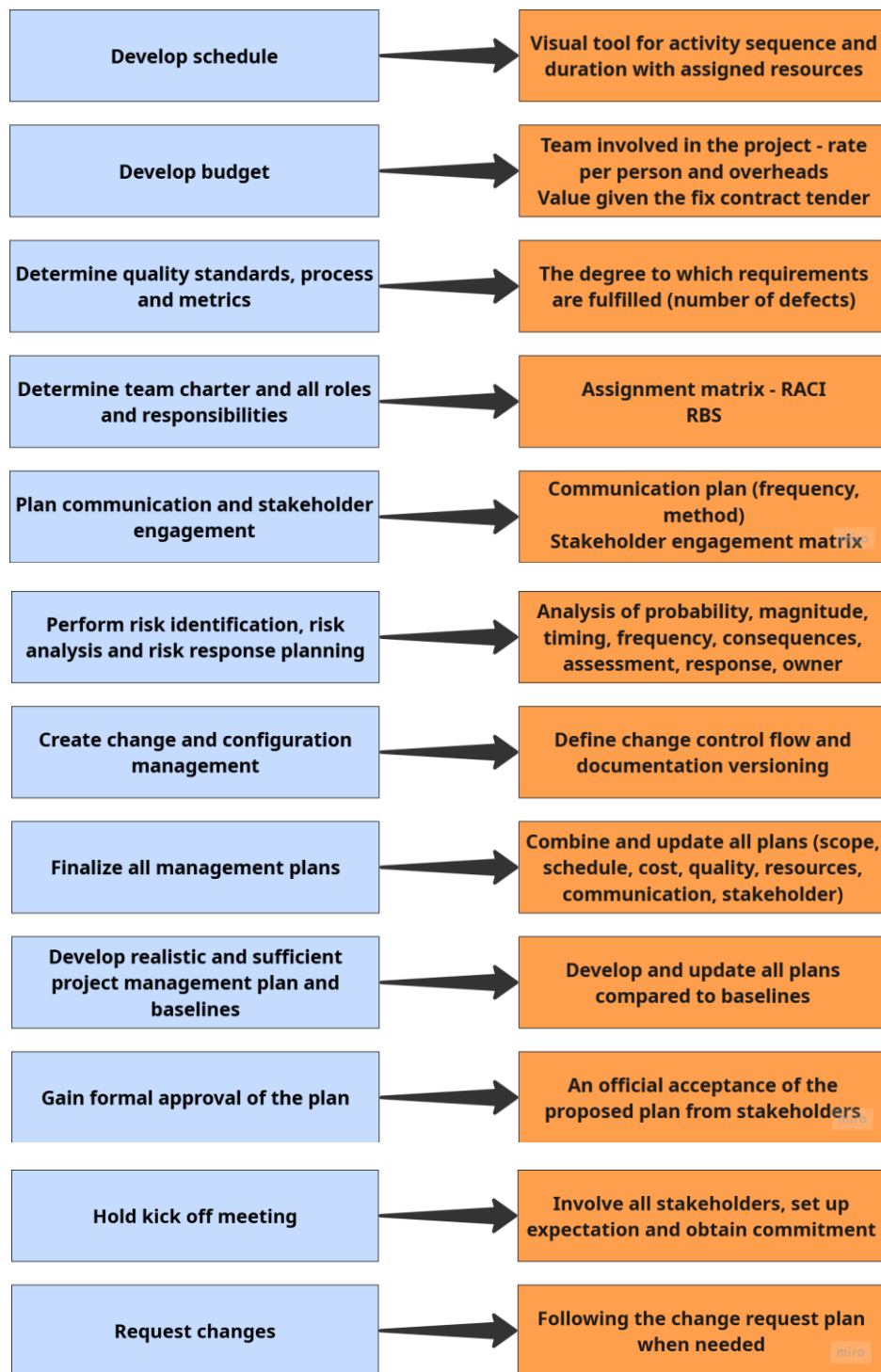


Figure 3: Planning steps adapted for this study case proposed by the human project manager
(Source: Rita Mulcahy, 2020)

Backlog requirements

In this phase of the planning process, project manager centralizes written requirements. These were completed according to the initial request available online.

In the subsequent steps of the traditional execution of the planification for the proposed project, the actions described by Rita Mulcahy (2020) in her book were followed.

Establish the approach: hybrid

A project can be approached using different methodologies: waterfall, agile, or hybrid, as mentioned by project management institute in the PMJ Practitioner Insights (2022). Typically, it depends on each company and on their rules and procedure, however the project manager will decide or will be involved in the decision process for determining the approach of the project.

In this study case, because in the public requirement there is a contract with fix budget, limited in time, and containing multiples objectives requested, the waterfall model alone could be used. Nevertheless, a hybrid approach is proposed, that include both waterfall and agile, because in the Software Requirements Specification was not outline a fix scope, however, was mentioned several times that new requirement which could be discovered during the execution phase must be accommodated, such as changes in the legislations or clarifications during the development that were not specified in detail at the beginning.

With the proposed framework, there will be a fix timeline, a fix budget, and development will be performed in iterations. Moreover, using the agile mindset, the development team will work together with the business and will show regularly the work that was implemented in the previous iteration, in order to receive feedback or confirmation that it is working as expected. Following this approach, the team can be able to accommodate all corner cases that were not included in the initial requirement document.

The proposed phases of the projects will be analysis, design, document proposal, present proposal, approve proposal, update proposal, implementation, migration, optimization, test and adjustment, which are related to the waterfall approach. The development part, migration, optimization, test and adjustment will be done in iterations, which are related to the agile approach. In the next imagine (Figure 4) are illustrated the stages proposed by the human project manager for this project considering the hybrid approach.

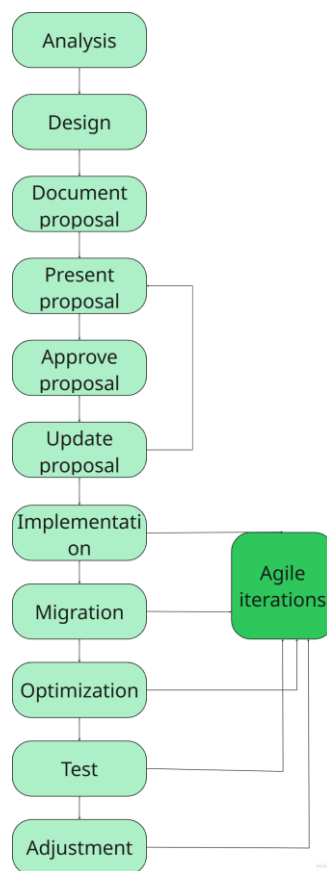


Figure 4: Adapted stages proposed for this study case
(Source: adapted from Microsoft, What is the software development life cycle?)

Considering the details related to the contract, with a fix time and a clear objective, the project manager will plan, monitor and control the project, according to the approved plan. Since a hybrid method was chosen, the proposal of the human approach is that at the beginning, to have a high view of the planification and as progressing in time, when it is known more about detail to elaborate and update the plan, as the team meets regularly with the business side and check to validate that it is within the scope.

Ordering for required activities

The next step done for the planification of this study case is to define requirements and to make a prioritization in a logical way in order to accomplishing the actions. The professional project manager detailed all activities of the project that need to be completed and included, not only items related to development of the code, but also activities expected to be done by other actors involved. Usually, the backlog that contain all requirements is updated and completed after the analysis phase of the project. At the same time, the chosen approach in our study was the hybrid one, that also assume not all details are known upfront and are expected to be explained as the project advance, in iterations. In addition, part of the documentation of the initial requirement list prioritized, is the assumption log, that contains hypothesis proposed for unpredictable elements.

In the analysis phase, the proposed plan will be to obtain information and collect all details for the implementation, using different methods, such as interviews, observation, facilitation and mind maps, following the PMBOK guidelines. To be sure that all use cases are covered, and considering the hybrid methodology chosen, there will be clarifications discussed that will use the same approaches (interviews, facilitations and mind map). At the same time, these new details in requirements, or possible new addition, will be checked and confirmed by the project manager, if they are within the scope. If yes, then the project manager will also check the impact in time, cost, resource and risks.

The project prioritization plan will first focus to do the update and migration phases, to check and ensure that all system functionalities are working flowless. The next action will involve the implementation of the new requirements module, followed by optimization and automation, while also ensuring security and confidentiality. Additionally, the plan includes provisions for disaster recovery procedures and ongoing maintenance. The proposed idea for prioritization is to have first what we call an MVP (minimum viable product) which in this case is to work with the new update and old functionalities, and then to add new functionalities and improvements.

According to Scrum Guide, the backlog is an ordered list of what needs to be implemented for a specific product or project. All these requirements and all actions performed by the development team will be documented in a dedicated tool where they can be tracked and monitored (such as a shared excel or Jira tool). In this way, all the stakeholders can visualize at any time, the entire backlog with requirements, their order of the implementation and their status. Each item will be added in the product backlog by the business analyst only after it was analysed and confirmed that it is in scope. Every element added in the centralized system, is proposed to have a standard shape, in the format of a user story. The Agile Alliance points out that a frequently suggested format, is the "As a... I want to... So that..." template. This approach is widely used to help teams and product owners when they are first learning to work with user stories and product backlog items. All product backlog items are proposed to have detailed requirements, acceptance criteria and use cases for tests. Following this way, the business analyst has a clear understanding on exactly what it will be implemented and what falls in scope of each item, which then will be confirmed with the beneficiary. At the same time, the developer will gain a clear view of the impact, use cases covered, and acceptance criteria, while the tester will have all use cases needed to be confirmed for validation. For this study case, the human project manager used for the project backlog item the standard format and acceptance criteria.

According to Marone (2000), there can be used a control tool, requirement traceability matrix, so that all the items that are developed to relate to the beneficiary request. In this way, there is a higher chance of acceptance from the client side, and it is also improving the overall quality while will help the tester during the check and validation phase.

For this study case, the PMI (Project Management Institute) template was used by the human project manager to create the requirement traceability matrix, published by Nyantakyi T. The purpose of these actions is to confirm that the scope is well detailed and explicitly write what items are needed to be implemented so that all deliverables are created and the project is considered completed.

Project scope statement

According to Mulcahy (2020), project scope refers to the set of tasks and activities the team undertakes to produce the project's deliverable. Also, according to PMBOK Guide sixth edition (2017), Institute Project management (2020) and Mulcahy (2020), it is important in the planification phase for the project manager to define correctly and completely the scope of the project. In this action is included the creation of the project scope statement, so that it can be used as a guide during the project. The elements added in this document, include the objectives, description of the deliverables, requirements, assumptions and constraints, as described by Institute Project Management (2022).

In this study case, for the creation of project scope statement, was used the example defined by the Institute Project Management (2022) to ensure the team remains focused on the project's objectives and to align the stakeholders.

Project managers also use project roadmap order to have a better visual overview of the progress indicators. According to Atlassian, the roadmap is a strategic tool that can be used to understand high level activities and to have a fast and clear view over the current status comparing to the goals.

This study case has a unique project scope that is tailored based on the specifications and needs described.

Work Breakdown Structure of the project work

According to Berg and Colenso (2000), the project manager should decompose the work into details and split into different levels and hierarchy for a better understanding and managing of the project. As indicated also PMBOK Guide sixth edition, the Work Breakdown Structure (WBS) contains the major elements that need to be implemented in a hierarchical display. This is a tool that was initiated in 1998 according to Berg and Colenso (2000) and has the purpose to be a visual organization of the scope that needs to be accomplished in the project.

According to Mulcahy (2020) the WBS is an essential instrument for the project managers in which the deliverables are identified without dependencies between activities. Together with the WBS diagram, there is also the dictionary, where is the description of the work associated with each element so that it can serve as clarifications for stakeholders.

In this study case, it was created an initial WBS, based on the requirements received and the next step would be for the WBS to be updated after the analysis phases, when different clarifications will be agreed on. As a template for the WBS was used the ones provided by Miro tool.

Prioritized activity list

All activities described in the requirements and composed in the WBS are kept in a centralized place so that both the stakeholders and the development team can have access easily. The project backlog, as described also by Gaona-

Cuevas et al. (2024) is an ordered list with all items needed to complete the request. In this way, the team is working all the time at the most important items that need to be implemented next.

According to Mulcahy (2020), defining and ordering activities means breaking down the WBS into the individual tasks required to achieve the deliverables of each work package. In this specific use case, there are some unknown details that are aimed to be discovered during the analysis phases and some that might appear during the development. To cover unforeseen items that can appear in the project, project manager can plan to use rolling wave planning. According to Microsoft (2024), this tool means to be able to adjust and refine while the work is done and it can be split into two waves: initial planning and as project evolve the more detailed plan.

Network diagram

For a better planification, according to Mulcahy (2020), project managers can create network diagrams in order to see the sequence of the items that needs to be implemented and the relation between activities. According to Sangkon and Shvetsova (2019) using this diagram, a project manager can have a visual representation of the items that are dependent on each other. Based on the network diagram, the project manager can determine which task needs to be accomplished first, in order for another to begin, and also is able to identify other constraints. The network diagram is used to determine the critical path, predict potential bottlenecks according to Mulcahy (2020). It can be used to distribute the resources effectively and better plan the overload. In this study case, the network diagram and critical path were not created, since it required more details than the ones provided in the specifications and could be discovered later, in the analysis phase.

Activities and resources estimate

In this study case, the budget is already publicly available and the company that implements the software is accepting it. Nevertheless, the project manager will do the estimation of the activities together with the development team, so that the project can be split into smaller items, to display it into a timeline and be able to allocate resources. As a best practice, Rita (2020) recommends in her book for a more realistic estimation, not only the list of items to be implemented, but also the assumption log, resources profile and availability and risk registry. In the current study case, the approached established in the plan for the estimation is the top-down type and as the project advance and the agile methodology will be executed, from sprint to sprint, the planning poker could be used.

According to Heldman et al (2018) the top-down technique, is also called analogous estimating and it uses actual costs of a similar activity completed on a different previous project to determine the cost estimate of the current activity. This will be used at the beginning, since not all the details are known before the analyse phase. At the same time, this is a lower technique in accuracy compared to alternative methods.

As the project progress under agile methodology, the team is planned to meet at a regular basis to estimate the items from the backlog. In order for the work to be better planned and accurate, the team will use the estimation poker techniques. Layton et al. (2020) describe this tool as a collaboratively game designed to size each item and build consensus among development team members. Each participant selects a card to represent their estimate for a given item, and the results are then discussed until the team reaches an agreement on the final estimate.

Critical path

Creating a project schedule requires information from past similar projects, including lessons learned, along with key elements of the project management plan as Mulcahy (2020) emphasis in her book. These elements consist in the list of defined activities, project milestones, documented assumptions, the activity network diagram, estimation data, activity duration forecasts, and resources needed. Additional inputs include the resource calendar, the resource breakdown structure, the organizational calendar of working and non-working days, records of resources already allocated by management or agreement, and the risk register.

As described by Abdel-Basset et al. (2022), the critical path constitutes the longest chain of dependent items in the network. It establishes the minimum completion timeframe required to deliver the project, even if though finalization may take longer if delays occur, the critical path represents the fastest possible route. This tool helps the project managers to maintain control and manage deadlines, by focusing on the critical items to be implemented.

In this study case, the critical path was out of scope because more details that should be discovered in the analysis phase were needed.

Project schedule

In the planning phase, the project manager is creating a version of the schedule with start and end date and resource assignments, as also described by Heldman et al. (2018) in their book. In this case study, the human project manager selected the Gantt chart to present the project schedule. This visual tool allows the project manager to view activity sequences and durations alongside the assigned resources.

According to Moylan (2002), the project schedule serves as a roadmap of planned activities, integrating scope requirements with work packages. It functions as both a guide for the project journey and a reference point for measuring progress, enabling the team to track achievements and management to assess performance. The schedule acts as a milestone indicator and a benchmark, and it is providing the structure for organizing project outcomes.

Cost management plan

According to Georgas and Vallance (1987), cost management is a function applied by project managers that integrates the processes required to maintain financial control of a project. It typically includes activities such as evaluation, estimation, budgeting, monitoring, analysis, forecasting, and the reporting of cost information. According to PMBOK Guide sixth edition, the cost management plan includes historical information, existing cost estimating guidelines, and different financial controls procedures.

In this study case, the budget is defined from the beginning, and the project manager is responsible to keep it under control. For a better oversight, the project manager can break down the budget into activities and phases. In

this specific analysis, the main costs included are related to the team involved in the project directly. This can be calculated by having a rate per persons and the estimation for each activity. Overheads are also included in the rates.

Quality standards, process, and metrics

According to PMBOK, the quality management outlines the activities and resources needed for the team to fulfil the project's defined quality objectives. Pribadi et al. (2020) describe quality as the extent to which inherent characteristics satisfy requirements, while project quality refers to the process of achieving business objectives as outlined in the project charter. As Mulcahy (2020) describe in her book, quality is the degree to which requirements are fulfilled, nothing less, nothing more. The requirements are planned to be described in this use case, as user stories and acceptance criteria for each item, to ensure the quality of each functionality developed.

The PMBOK Guide sixth edition defines a quality metric as a specific description of a project attribute that will confirm its compliance. Examples of such metrics include the percentage of tasks completed on schedule, defect rates, the number of errors detected daily, total monthly downtime, errors per line of code, customer satisfaction ratings, and the percentage of requirements addressed by the test plan as an indicator of test coverage. Specific for this study case, there are some quality measures requested to be fulfilled specifically, such as services available 24x7x365.

Roles and responsibilities

The PMBOK identifies the RACI (Responsible, Accountable, Consulted, Informed) chart as a widely used assignment matrix that categorizes stakeholder involvement in project activities by labelling them. As a form of responsibility assignment matrix, RACI is described as being a list with all stakeholders known and roles assigned to each of them.

According to Miranda et al. (2025) this type of chart is popularly used in project management, and it helps with the communication flow across the participants. The project manager designates the personnel responsible for each activity, and this document allows all participants to review their roles and responsibilities, ensuring transparency, preventing misunderstandings, managing expectations, and confirming that every task is assigned to the appropriate person, who understands what is required of them.

As outlines by Mulchay (2020), the project manager designates the individuals and stakeholders responsible for providing updates and reports, determines reporting lines, assigns participation in meetings, and identifies who will support risk management, collaborate with the quality department, and contribute to other project activities.

The resource breakdown structure (RBS) is a valuable tool that can be used by the project managers as a list of the resources allocated with their costs and recommended to be used in organizations as detailed by Rad and Cioffi (2004). Atlassian emphasis on the fact that resource breakdown structure demonstrates how the tool evolves throughout each phase of its life cycle, capturing changes in resource availability, project scope, and organizational priorities. In this study case, the resource breakdown structure, was made following the model proposed by Bika (2024) where can be seen the visual representation of the members categorized.

Communication and stakeholder plan

Ganis and Waszkiewicz (2018) highlight that projects rely heavily on communication because of the high level of interdisciplinarity within teams and the possible different location of their members. Choosing the right tool that can be used by the team will help improving the success rate of the project.

According to Minois (2023) there are different categories in this field, including stakeholder engagement and team collaboration. There is also a formula provided by the PMBOK Guide and described also by Rajkumar (2010) which refers to the range of possible communications routes. This calculation is presented as $n(n-1)/2$, with n used to signify the numbers of individuals on the team. As an example, for five people in a team, there will be calculated ten possible channels for communication. This means that the project manager will make sure that every team member involved will be informed and aligned with the requirements, status and details of the project.

To ensure that everyone involved in the project receives clear and consistent information, provided just in time and align with the objective of the project, a communication plan is recommended as a tool for the project manager, as detailed by Atlassian. In this study case, the communication plan was designed considering the proposed way of working, meaning hybrid. In the agile section of the methodology used, the team will meet on the daily basis to align on the project, in the daily meeting. Because the team is proposed in the plan to use a two-week sprint, there will also be a bi-monthly meetings, as described in scrum guide, such as planning meeting, review meeting and retrospective. At the same time, the project manager will meet weekly with the project manager from the beneficiary side to discuss on status and progress, as requested in the initial documents of the project.

According to PMBOK all stakeholders impacted by the project should be identified and their expectation, interest, level of influence and level of authority should be established to be effectively managed and engaged throughout the project lifecycle. According to Mulcahy (2020), the project manager should plan for stakeholders to be engaged, and define a communication approach, manage their expectations and continuously monitor both communication and stakeholder engagement.

According to Miller and Oliver (2015) the project manager should engage stakeholder in a consistent and organized manner. A stakeholder management plan is recommended. In this study case, the human project manager created the stakeholder management plan following the template provided by Snyder (2013) from project management institute. In the plan are detailed all the people identifies and their current level of engagement.

In addition, there can be a gap caused by unclear feedback, also known as gulf of evaluation. As described by Project Management Research Institute, this describes the disconnect between the actual state of a system and the user perception. If there is a mismatch and it is not checked and confirmed for a longer period, it could lead to rework, additional costs and negative impact on the entire project.

PMI is also recommending the use of the stakeholder engagement assessment matrix. As Vogwell (2003) describes, the project manager should do a classification for all stakeholders according to their interest and impact that they can have on the project. In this study case, the professional project manager detailed all stakeholders identified and categorised them in a matrix from low to high power and interest.

Risk management

According to Mulcahy (2020), there are risk factors when trying to determine the likelihood of a risk event happening, the potential consequences or scale of impact, the point in the project life cycle when it might occur, and how frequently such an event could arise from that source. This means the analysis of the probability, magnitude, timing and frequency. PMBOK edition sixth outlines the steps project managers should follow in order to manage risks that may arise during a project. Pym (1987) argues that when it comes to risks, one can never be too prepared. In his article, a project manager should identify the risk, create a response system, made an analysis of the impact and a plan for response.

According to Mulcahy (2020) the project manager can use different tools to identify risks that might arise in the project, for instance data gathering and data analysis. In these categories, can be included brainstorming, conducting interviews, reviewing documentation, performing root cause analysis, examining assumptions and constraints, SWOT analysis, and utilizing checklists for analysis.

In the PMBOK, the risk register is detailed as a document prepared at project beginning and continuously updated during execution. In this study case, the human project manager created the project risk register, following the template format provided by Masood, provided by PMI. In the matrix there are outlined the entire list of risks identified, date, the details and consequences, what can trigger it, who is the owner of it, an assessment, and response details.

According to Mulcahy (2020), a project manager should perform a qualitative and quantitative risk analysis in order to have a clear view of the probability, impact, and to determine the overall project risk exposure. There are also described different strategies to respond to risks, such as avoid, mitigate or transfer.

Formal approval and kick off

Depending on the company and its internal policies, the management plan may need to be a formal document approved by senior management, or in some cases, it might even require official client approval. In this study case, the plan proposed by the project manager is set to be presented and approved by the beneficiary.

The following step involves the project manager initiating the plan's execution with the assigned team. One of the suggestions of Mulcahy (2020) book is to do the kick off meeting with all the stakeholders involved in order to set up the expectation and to obtain commitment.

Next steps

In this study case, the project management integrate all the proposed documents and can start the execution. As also recommended by the PMBOK, all these documents should be iterated and updated later in the project, as project evolve and more details are known and could have different impact. This may involve adding new items to the product backlog, updating the stakeholder list or identifying additional risks.

3.2 Study case phase 2: Artificial intelligence approach

The tool used for this second approach, AI-driven is ChatGPT Plus (OpenAI), utilizing a GPT-5 model available at the time of the analysis. The initial prompt given was the following: "Act as a professional project manager with over 7 years of experience in project management for software development. The project manager has won a new project and attached are the official specifications document, which contains the detailed requirements. Develop the complete planification of this project in details. Structure everything in a professional, clear, and well-organized document that can be presented directly to the client. Write the response in English".

The initial response was to present a big picture plan, aligned with international best practices, such as PMBOK and Prince2. The response starts with an executive summary, objectives, general and specific, scope and deliverables, a description of the project organization and a WBS and schedule proposed. It was also mentioned the risk and quality management, communication and reporting, logistic and reporting and acceptance and closure.

In the Figure 5 can be visualized the steps proposed by the generative artificial intelligence created in Miro tool.



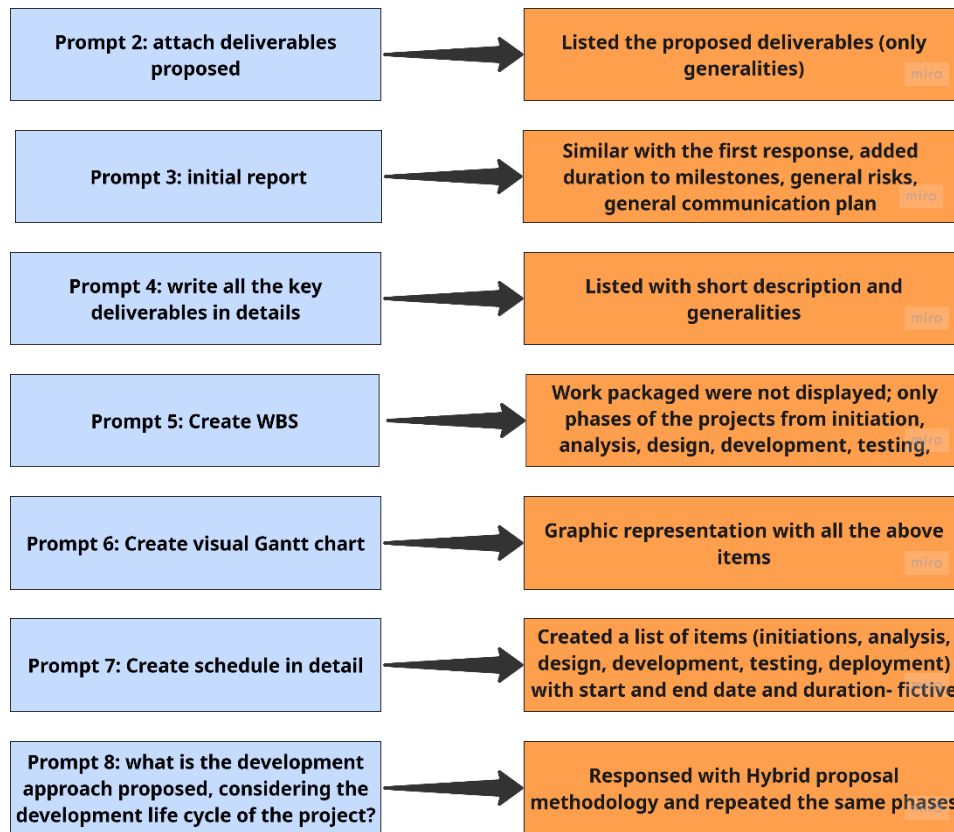


Figure 5: Planning steps proposed by ChatGPT
(Source: ChatGPT)

As it can be seen in the figure above, the prompt continued with the second iteration, where it was proposed to “Attach all deliverables proposed”. The response was a list of deliverables mentioned for each phase considered, starting with the initiation, continuing with the analysis and closing with maintenance, change request and project closure, as a response from the AI tools side. The third iteration input was to “Write the initial report” and the response displayed was an overview of the scope, details about governance and organization, a high-level Work Breakdown Structure description, details regarding phases and milestones with duration proposed, an initial version for the risk register, short details regarding quality assurance, communication, next steps and approval. On the fourth iteration, the prompt added was to “write all these key deliverable in details”, that were referring to the deliverables mentioned by Gen AI tool in the previous prompt. For each line it was received high-level input. The fifth iteration was to “create the WBS”, but the response was split in phases, such as initiation, analysis, design and closure, similar with the previous responses already given. At the end of this response of the fifth iteration, the AI asked if it is needed a visual Gantt chart. The sixth iteration was with the response “yes” and then ChatGPT presented the visualization of the proposed Gantt chart.

Furthermore, the seventh iteration was with the following instruction “create the schedule in detail” and a document split in tasks and grouped by phases, with proposed start date, end date and durations was displayed. The last iteration, the eighth one, was “what is the development approach proposed, considering the development life cycle of the project?” and it responded with details regarding split on proposed phases, but also the hybrid proposal.

The entire conversation with the questions asked and the responses received from ChatGPT is available in appendices.

4. Results

The result suggests two project planning proposals considering identical input conditions. The plan created by the human project manager relies on contextual understanding, industry practices, and various tools like Jira, Miro, and Atlassian templates. The proposed plan reflects practical experience, iterative reasoning and methodological justifications.

The AI-generated plan follows a structure based on PRINCE2 and PMBOK terms (version not mentioned). The results received are different in size, while the AI produced 20 pages, the human project manager approach had 10 pages and 17 Annexes. The human plan covers PMBOK areas and details for the planning processed, as described by Mulcahy (2020), whereas the AI plan addresses them conceptually but lacks documentation details specific for the requirements received.

Below in Table 1, is summarised the comparison between the two approaches, using the following proposed criteria. The AI generated plan is fast, however it can be at risk to provide insufficient information and not tailored on

the project. The human plan is more time consuming, however it has a higher fidelity to industry standards and domain specific of the requirements provided.

Table 1: Comparison between the two approached based on proposed criteria

Criteria	Human Approach	AI approach	Comments
Time spent to produce the plan	3 working days	1 hour (considering the checking, reading responses)	Artificial intelligence gives an almost instant response; however, it requires human supervision and input and knowledge to observe the wrong information received
Proposed documents and deliverables	17 annexes part of the planning and 39 deliverables mentioned	19 mentioned at the first iteration and 34 only listed at the second iteration	AI did not provide some documents that are mentioned in best practices (e.g. Project Scope Statement, WBS Dictionary, Responsibility Assignment Matrix (RAM), RBS, Stakeholder engagement assessment matrix)
Context relevance	High (tailored on the specific tender and annexes likely cannot be used as it is for another project)	Lower (focused on general information) Inaccurate details (such as initiation, closure mentioned in planning phase)	Human professional relied on the contact and specific requirements provided, AI lacks specificity
Output	10 pages and 17 annexes	20 pages	The human approaches have tables and figures created in different tools
Tool utilization	Jira, Miro, Atlassian	No tool proposed	Human approach used different templates
Best practice guide	Mulcahy, PMBOK	PMBOK, PRINCE2	

(Source: Authors analysis comparing the response following best practices PMBOK)

Regarding the response time, the planification done by the human project manager is approximatively 24 times bigger than the one done by AI. ChatGPT gives almost instant responses, however the mention 1 hour from the above table include the entire conversation, reading the details received and decide how to proceed with the next prompting integration.

The professional project manager, considered the planification based on the best practices from PMBOK guide and created the list of deliverables, as follows: backlog requirements, list of activities of the project, traceability matrix, project scope statement, work breakdown structure, document assumptions, resource requirements, risk register, Gantt Chart, RACI Matrix, resource breakdown structure, communication plan, stakeholder management plan and stakeholder matrix. The AI generated response provided description on the project management plan, mentioned risk, quality, communication management, work breakdown structure, Gantt chart visualization based on the phases of the project (not based on activities) and a schedule.

4.1 Narrative analysis

Using Yin's (2003) case study methodology, both documents were analysed narratively, considering qualitative insight and analytical reasoning. Human approach follows a logical sequence, link the process to best practice and explain why the proposed steps were chosen (for instance, how the hybrid model was chosen due to fix cost from the contract, but evolving requirements). While the artificial intelligence approach listed all the proposed elements in high level details, it does not explain the details proposed or context specificity.

The traditional approach made by a human project manager was based on the experience of one of the authors and best practice from the industry from PMBOK and described in Mulcahy's book. In the next imagine (Figure 6) can be visualised the proposed steps for planification done by the human project manager, while the imagine below (Figure 7) can be visualised the steps proposed by ChatGPT.

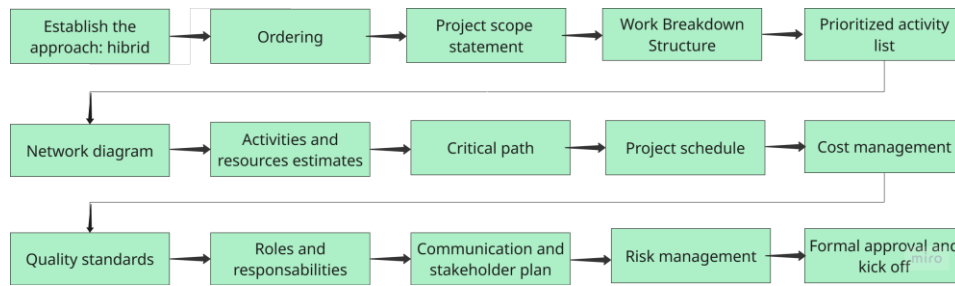


Figure 6: Proposed steps for planification by the human project manager
(Sources: adapted after Mulcahy, 2020)

In contrast, the artificial intelligence approach provided a slightly different proposal for the structure in the first iteration of the prompting request, as can be seen in the next image.

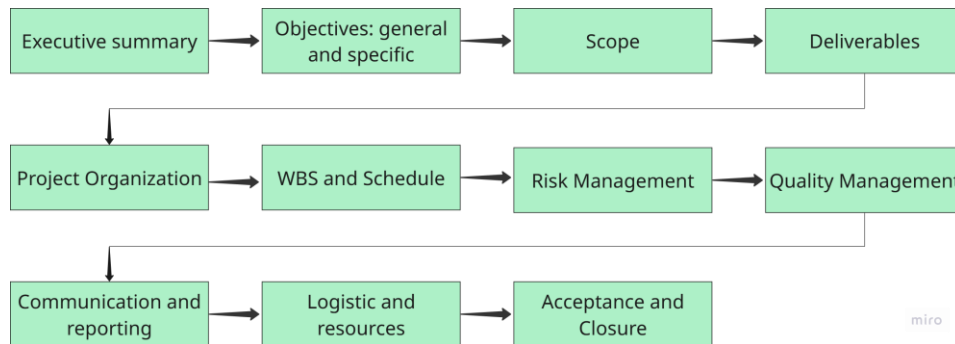


Figure 7: Proposed steps for planification by artificial intelligence on first prompt
(Source: ChatGPT)

The steps proposed for the description of the plan are slightly different between human and artificial intelligence. While both have the Project scope, WBS, Schedule, Communications, Quality and Risk management, there are also some differences in approaches. The artificial intelligence proposed the start with an executive summary and description of the objectives and deliverables, while in the human approach, the objectives and deliverables were included in the “Project scope statement”. Artificial intelligence proposed in the planification, details regarding project organization, while the human approach included these details in Roles and Responsibilities and Communication and Stakeholder plan. Artificial intelligence mentions logistics and resources in a separate section, while in the human approach the logistics are not mentioned, based on relevance.

In the artificial intelligence response, the last proposal is related to acceptance and closure, and it is referring to the completion of the project (a different phase than the planning phase), the human approach was related to the end of the planning phase, obtaining approval for it and start the execution with a kick-off meeting.

The human approach contains some elements that were not included in the initial proposal from artificial intelligence, such as prioritized activity list and kick-off. Prioritization and critical path appeared in the AI generated, however only in the fourth iteration of the prompting, when explicitly required more details.

Both the AI system and the human project manager suggested adopting a hybrid development life cycle, using the waterfall model for overall contractual requirements and deliverables, while carrying out the software implementation through iterative cycles. Both the human and the AI had the same idea to build on the predictive methodology all the details from the contract, and in Agile iterations to start building it, in order to be able to obtain early feedback from the beneficiary.

On the human perspective, the proposed phases were analysis, design, document proposal, present proposal, approve proposal, update proposal, implementation, migration, optimization, test, adjustment. In contrast, on the first iteration of the prompting in ChatGPT, the response was project initiation (a different phase than planning phase), analysis, design, development and migration, testing and validation, deployment, training and documentation, maintenance, change requests. While both approaches contain analysis, design, development, migration and testing, there are also slightly different responses. The human perspective presented some iteration on the document proposal and approval, as requested in the specifications, while were also included a part for optimization and adjustment, as requested in the document. The AI tool started with the project initiation phase, which is a phase that should happen, according to PMBOK, before the planning phase. It mentions specific the deployment, training and documentation, maintenance and change requests.

Regarding the prioritization of the required activities, the human approach was to have a backlog that is refined periodically with the team, and it is in the order of the priority, so that the developers will work on the most important item at a certain point. In real life projects, this prioritized work is performed because, in case the project stops at a certain point (for instance because of lack of funds) is better to have something implemented with the most

important features, even if it is not completed, and does not have ‘nice to have’ functionalities. The artificial intelligence mentioned prioritization as a recommendation in the fourth iteration on the prompting.

The project scope statement was added in the human planification phase, following the best practices in the industry, but not in the AI generated response. However, details about the scope, description, and deliverables were mentioned in the AI proposal, nonetheless not specific mentioned on the scope statement. Work Break down Structure was proposed as an important topic in both human and AI approaches, while network diagram is only found mentioned in the human approach proposal, but not developed.

4.2 Comparative analysis

Below is a description of the comparison (Table 2) between the two approaches, considering the proposed criteria and the results for each side.

Table 2: Comparative analysis

Criteria	Human Approach	AI approach
Proposed structure of the planification phase	Establish the approach, Ordering, Project Scope Statement, WBS, Prioritized Activity List, Network diagram, Activities and Resources Estimate, Critical path, Project Schedule, Cost Management, Quality Standards, Roles and Responsibilities, Communication and Stakeholder plan, Risk Management, Formal approval and kick-off	Executive summary, Objectives, Scope, Deliverables, Project Organization, Risk Management, Quality Management, Communication and reporting, Logistic and Resources, Acceptance and Closure
Development life cycle	Hybrid (Proposed at the beginning of the planification)	Hybrid (Proposed on the 8th prompting iteration, after specific questioning about it)
Proposed phases of the planification of the project	Analysis, Design, Document Proposal, Present Proposal, Approve Proposal, Update Proposal, Implementation, Migration, Optimization, Test, Adjustment	Project Initiation, Analysis, Design, Development and Migration, Testing and Validation, Deployment, Training and Documentation, Maintenance, Change Requests (1st iteration)

(Source: Authors comparison based on the two approaches responses)

4.3 Benchmark analysis

This is a comparison of the two approached based on the ten PMBOK sixth edition knowledge areas, as described by Thoughts C (2025). In the following imagine (Figure 8) it was used Project schedule as described in PMBOK, instead of project time management as mentioned by Thought.

PMBOK knowledge areas	Human Basis approach		Artificial intelligence approach	
	Mentioned	Processes	Mentioned	Processes
Project Integration Management	Yes	Develop Project Management Plan	Yes (but integration not named)	Develop Project Management Plan
Project Scope Management	Yes	Plan Scope Management	Yes	Plan Scope Management
		Collect Requirements	Yes	Requirements
		Define Scope	No	No
		Create WBS	Yes	Create WBS
Project Schedule management	Yes	Plan Schedule Management	No	
		Define Activities	partially mentioned	Activities
		Sequence Activities	Yes	Sequence Activities
		Estimate Activity Duration	partially mentioned	Estimated duration
		Develop Schedule	Yes	Develop Schedule
Project Cost Management	Yes	Plan Cost Management	No; Only mentioned once	Plan Cost Management
		Estimate Costs	No	Estimate Costs
		Determine Budget	No	Determine Budget
Project Quality Management	Yes	Plan quality management	Yes	Quality management (not mentioned as a plan)
Project Resource management	Yes	Plan Resource Management	Partially mentioned- Not mentioned as a plan	
		Estimate Activity Duration	No	
Project Communication management	Yes	Plan Communication Management	Yes	Communication Plan
Project Risk management	Yes	Plan Risk Management	No	not mentioned as a plan
		Identify Risks	Yes	Identify Risks
		Perform Qualitative Risk Analysis	No	Perform Qualitative Risk analysis
		Perform Quantitative Risk Analysis	No	Perform Quantitative Risk Analysis
		Plan Risk Responses	No	Plan Risk Responses
Project Procurement Management	No	not applicable	No	not applicable
Project stakeholder management	Yes	Plan stakeholder engagement	partially mentioned	not mentioned as a plan

Figure 8: Comparison between human and AI considering PMBOK benchmark and Mulcahy's book
(Source: Author comparison based on best practices)

On the human approach, the alignment with the process was 9 out of 9 and on the AI approach, the alignment was 7 out of 9 partially mentioned.

4.4 SWOT analysis

On the below table (Table 3) was created a SWOT analysis (Strengths, Weaknesses, Opportunities and Threats) for both the artificial intelligence and human approach.

Table 3: SWOT Analysis

	Human Approach	AI-Driven Approach
Strengths	Context understanding and tailoring Methodological rigor Supporting reasoning Stakeholder awareness Communication skill focus Creativity (for instance utilization of different tools) Specific and details annexes (requirement list, assumptions, stakeholder engagement etc) Compliance with PMBOK	Fast plan generation Clear Structure Deliverable list Access to large sets of data Continuous improvement using prompt engineering The information reveals and is presented in more details if asked specific in prompts Include more standards than the PMBOK (such as ISO, Software development practices)
Weaknesses	Time consuming Subjectivity Dependent on individual expertise Potential over-documentation Can be prone to human errors	Limited contextual adaptation Potential factual inaccuracies and omissions of important references Presented a lot of details and duplicate information Lack of specific details (example of risk register, stakeholder matrix, RACI) Partial compliance with PMBOK
Opportunities	Integration with AI tools Access to possibility to generate automated templates	Can be used by non-experts to create a good plan in a fast way
Threats	Human biases Dependence on individual experience Limited knowledge in industry or project management best practices	Ethical and data privacy concerns Prompt bias Risk of inaccurate information that cannot be detected by new-entry in the field

(Source: Authors analysis on the two approaches)

4.5 Framework evaluation

On the below table is presented each approach based on the proposed framework criteria and a score given for each line.

Table 4: Comparison between human and AI approach considering the proposed framework

Area	Criteria	Human approach	Artificial intelligence approach	Score human vs GenAI
Scope and Structure	Level of planning depth	detailed and structured	structured moderated detailed	4 vs 3
	Working methodology	described and explained	described and explained	5 vs 5
	Completeness of the list of activities and deliverables	detailed and structured	detailed and structured	4 vs 4
	Assumptions, constraints, exclusions	detailed	not mentioned specifically	4 vs 1
	Acceptance criteria	detailed	minimal	4 vs 1
	Clarity and completeness of task breakdown	detailed with specific activities from the projects using a schema	detailed with phases in the project	3 vs 2
Schedule	Logical sequencing of activities	detailed steps /explicitly addressed	detailed with phases, not activities of the projects	4 vs 3
	Gantt chart	detailed on each activity	detailed with phases	4 vs 3
Resources	Clarity of resource requirements	clearly detailed	minimal mention	5 vs 1
	Roles and responsibilities	detailed in RACI	minimal mention, but not detailed, nor structured	4 vs 1
Risk	Resource breakdown structure	detailed in schema	minimal mention	4 vs 1
	Identification and analysis depth	detailed with cause, consequence, trigger, owner	moderated detailed	4 vs 2
Quality Stakeholders	Alignment with project standards	slightly mentioned	moderately detailed	1 vs 3
	Stakeholder plan	detailed with level of engagement, communication needs, method and frequency	not mentioned specifically	4 vs 1
	Stakeholder analysis	identified and categorised on function, role, power and interest	not mentioned specifically	4 vs 1
Communication	Communication planning structure and clarity	detailed with description, frequency, channel, audience and owner	detailed but not in a structured manner	4 vs 3
Cost	Budget	slightly mentioned	mentioned once	2 vs 1
Integration	Level of integration plan	not mentioned specifically	not mentioned specifically	1 vs 1
Procurement	Planification for the procurement	not mentioned specifically	not mentioned specifically	1 vs 1

(Source: Authors analysis on the two approaches)

The total score for the human approach in this particular case is 66 points and for artificial intelligence is 38. It is very important to mention that this does not mean that ChatGPT tools does not know how to create a more detailed and structured plan. This scored was given specific on the results presented from both side giving the same input (to act as a project manager and do the planification phase). Since AI did not receive specific instruction to deliver specific documents, it did not provide nor mention, hence the lower score. Most likely if in prompting, it was added all the above criteria in requests, the result and score would have been different. However, the comparison proposed was

based on the same input and the same level of details provided. Since nor the human project manager did not receive specific instruction to provide a certain documentation, this is the reason why neither the AI did not receive it.

Another reason for this score differences could be these specific criteria selected, that were based on the knowledge area from PMBOK.

At the same time, the scoring was performed based on qualitative analysis considering the criteria proposed for each component. Higher score was provided to the elements that presented detailed and structured documentation, based on the best practices. The lower score means missing details, or briefly mentioned or vague presented. It needs to be considered that might exist the evaluator bias, since the scoring was done based on subjective assessment.

The differences between the approaches, could also be because the human professional has a certain experience based on the project that managed in his experience, the industry knowledge and knowledge about how a response to a public auction could be written based on his experience. The AI is not limited to one person experience, but it has a very big database. However the response depends on the input provided, requirement given and on the development of the AI model used at the moment of the analysis.

The impact that this could have for project management practice, depends on how is using AI. If a junior professional is using the AI tool, can receive a useful input. However, it might not be able to distinguish on what is wrong information, because it does not have enough experience or knowledge to compare or to identify misleading details.

AI tool can be used as a very good start, but it should be checked with an official and recognized methodology.

5. Discussions

5.1 How does the study case respond to research questions

The proposed study case question is: “How it is different the planning done by a human compared with an artificial intelligence, in terms of structure, sequencing, logic, time, completeness of the documents proposed, compared with project management best practices?” In the next table (Table 5) are described details for each approach, on different criteria, such as structure, sequencing, logic, time consumed, completeness and comparison with the best practice in this field. Based on this question, it can be seen that there are similarities and differences. In terms of proposed structure, the order is different and the human project manager presented more details deliverables and processes proposed, respecting the best practices. If asked specifically, the artificial intelligence can also give good input about these topics, but was not included in the first broad prompt response.

Based on the time involved, the human project manager spent 3 days on the planification for this project. The prompting took approximately 1 h for all 8th iterations, considering also the reading of the description followed by specific input. The response of the AI is immediately (under a minute), the rest of the time is based only on the reading of the provided information, processing and establishing the next steps. At a first sight, the human based approach seems to be more complete than the artificial intelligence but only based on the experience and theoretical knowledge of the project manager. At the same time, the generative AI response, can become better, if asked specific for a certain output.

Table 5: Discussion based on the research question

	Human Approach	AI approach
Structure	Fundamental structure, mixed with contextual details	Clear, standardized plan- organized with heading and logical flow
Sequencing	Dynamic sequencing, considering constraints and risks	Linear sequencing, and lack justification (if not asked specifically)
Logic	Specific why methods were chosen	Formal logic
Time	Substantial investment of time (3 days)	Very fast, almost instant responses (1h)
Completeness	Broader completeness (assumption details, constraints, backlog list, activity list, stakeholder engagement strategies)	Enumerate standards and project deliverables, however some without details
Comparison with best practices	Align with processed and knowledge areas	Align with PMBOK; the link with the processes is not mentioned

(Source: Authors based on the responses presented in this study case)

5.2 How does the study case respond to the proposed questions

On this study there were proposed 4 questions, as follows:

1. How is the overall structure of the two proposals?
2. What level of details are proposed by the two parts?
3. Do both actors propose the same documents and deliverables?
4. Does any of the actors have wrong or incomplete information?

In the following table (Table 6) are presented the similarities and differences between the two approaches for each question proposed.

Table 6. How does the study case respond to the proposed questions

Question	Human approach	AI approach
How is the overall structure of the two proposals?	Structured aligned with project management standards Logical integration Contextual adaptation Explanatory flow	Structured plan Formal completeness
What level of details are proposed by the two parts?	Expanded discussion for each management process Include templates, annex references (such as WBS, RACI, risk matrix, stakeholder matrix) Include tools recommendation (Miro, Jira) Describe rationale for chosen methods	Extensive list of deliverables, without explanation in detail on how the elements were added or validated (if not asked specifically) Elaborates phases, milestones and deliverables, without elaborate more details or assumptions or decision making
Do both actors propose the same documents and deliverables?	Both approaches overlap a big number of deliverables (project backlog, requirements traceability matrix, WBS, Activity list, Risk register) Connects deliverable to a process	List the deliverables to be produced sequentially
Does any of the actors have wrong or incomplete information?	Connects each deliverable to a process Covers assumptions, constraints Can have incomplete output, based on the experience of the professional project manager	Can have omissions – lack certain documents Lack contextual clarifications Does not present any specific details based on the requirements (backlog, activity list, risk register) Present unclear details (initiation, closure-different from planification phase)

(Source: Authors based on the responses presented in this study case)

The overall structure of the two proposal is slightly different. The response of the same planification performed by different professionals could be very different and it is based exclusively on experience and theoretical knowledge of the individual. Both approaches cover the main essential requirements, while the human approach has some details that were not mentioned by the artificial approach. The AI response is general and not related in detail with the initial requirement. The human based approached is more detailed and specific to context described in the tender.

As an overview of the results received in this study, generative artificial intelligence (ChatGPT) can be used complementary rather than in replacement. A human project manager expertise could be beneficially when integrating tailoring specific to context and apply ethical reasoning. At the same time, artificial intelligence can be used for a fast generation of information, automatization of the tasks, such as utilization of the templates for different deliverables.

In this study it was emphasized that the human project management expert judgement could be considered as irreplaceable for interpreting ambiguous requirements, at least at this point of the artificial intelligence evolution. A human professional that would direct, correct and filter AI result is strongly still needed. At least for the near future, the professionals human project managers should validate AI responses and make contextualized outputs, rather than producing all content manually and save a lot of time.

6. Research motivation

The authors selected the second phase of a project, meaning the planning phase, that can be referred as the most time-consuming and that needs extensive project management knowledge. This can be considered because the list of strict activities that needs to be done in a certain order, as described by Mulcahy on process on domains chart.

In addition, there is growing discussion today about AI and its impact on the workplace of project management field. The authors aimed to search for empirical evidence on whether artificial intelligence can truly replicate expert human reasoning in project management planning. This same case study would likely present different results in six months or in one to two years and it will be interesting to document how the impact of AI is evolving and it is integrated in real life projects.

7. Ethical considerations

Applying the planning-phase analysis to an actual project within a specific company was not feasible, so the study used a publicly available set of documents to avoid confidentiality risks. Another ethical concerned is related to the content generated by artificial intelligence (ChatGPT) that lack traceability in order to verify sources.

A potential ethical concern is related to the fact that there is a dual role of the human project manager and one of the co-authors. This dual role could produce potential biases. To mitigate this, the co-authors selected a document requirement that the authors have no prior exposure and unrelated to the field that the project manager is working currently. In addition, the results were compared with the best practices in the field. In order to minimize bias associated with self-knowledge, all procedures were documented systematically. In addition, there are included the output evidence for traceability. All these actions were done in order to ensure methodological differences comparison and a neutral rather than subjective interpretation.

8. Assumptions, constraints, limitation of the study case

This study has several limitations, which are outlined in the following sentence. The sample size is small and include only one human project manager, who is also one of the co-authors. In addition, the comparison was done once, and this might limit the consistency of the findings. Future research could involve multiple AI tools and a larger number of project managers working with the same requirements, allowing comparison across professionals. In addition, future studies could incorporate external expert review to validate plan generated by the human professional. Another proposal to extend this study could also be expanded to include multiple project documents rather than a single case.

It can be considered as another limitation that the planning activity was created by a project manager and not by multiple participants with different roles. In companies, the planning typically involves contributions from various roles, such as business analysts for requirement breakdown or development teams for effort estimation.

A further limitation concerns is related to the quality of the plan generated by the AI that depends heavily on the prompts provided. Since prompting skills vary with the user's experience, the outputs may differ across individuals. Considering the experience of the person that introduce the prompting, the quality of the result can be different.

9. Conclusion

This study presented empirical evidence for the comparative results between the two actors involved, the human professional project manager and the generative AI. This evidence was provided under comparative input and differences and similarities were presented. The human project manager can overlook to include certain elements due to limited experience or domain knowledge. At the same time, the AI tool can be used exactly with this purpose, to help identify missing components or to offer alternative ideas.

Also, the human project manager perspective is shaped by the professional exposure and practical judgement, while the AI can rely on extensive knowledge that is not always delivered in the most useful way. Specific, as it is presented in the article, AI may provide either excessive details without meaningful substance or insufficient information that do not cover all required aspects. Moreover, based on the prompter experience, the response can be very different.

This study provides practical evidence that AI can support traditional project planning by speeding up the process while still producing a complete structure, although it can be considered limited in understanding context. The combination between human expertise and AI can be effective, because based on the project manager expertise, the AI can develop specific requirements that were not displayed on a broader question. Typically, a more precise prompt, can generate more insightful and relevant output.

Overall, the human plan aligns with the PMBOK sixth edition areas at a detailed level, and integrates judgement, making it an adaptable and tailored plan. In contrast, the AI plan aligns at a conceptual level, significantly reduce time and effort providing a well structured plan, but omits documentation level depth.

In conclusion, at this stage of technological development, the generative artificial intelligence can be viewed as a collaborative tool that can be used by professionals in order to increase efficiency, generate templates or refine outputs.

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