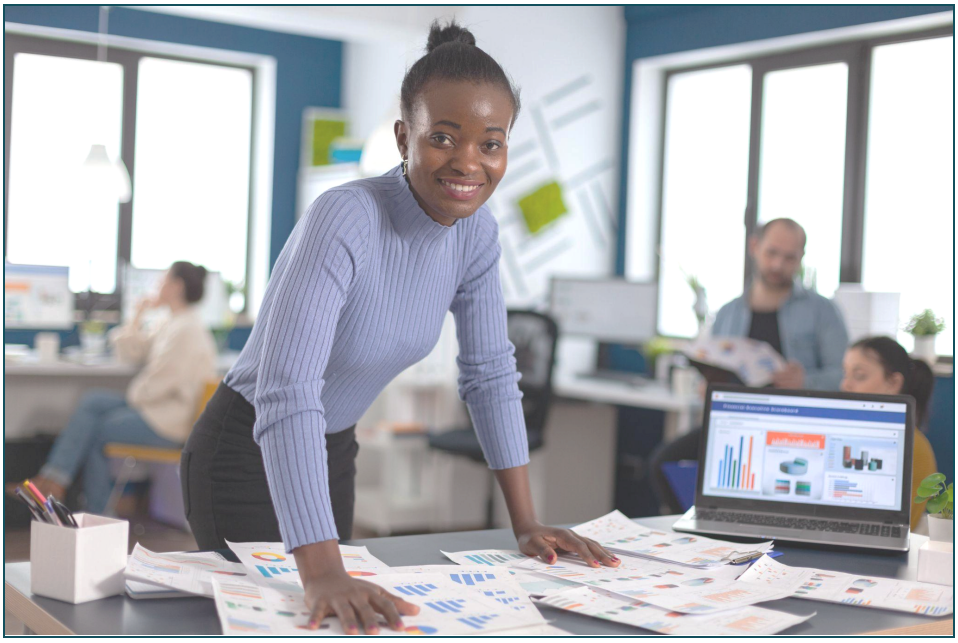
SoftEd

Applying Generative AI in Project Management

Student Guide
Version 2.2

Welcome

Generative AI for Project Managers



1. Introduction

Imagine you could write a letter to yourself ten years in the past, giving yourself career encouragement. It would be a chance to affirm how many new skills, experiences, and opportunities for growth lay ahead. You could give yourself a sneak preview of how your job would change and how your career would progress over the coming decade.

As you were to write this letter, I'm sure you'd be struck by how different you would seem to the past you. And surely your job as you do it today would look very different to your job ten years ago. What would you share with your past self? Just think for a moment about what has changed about your job and your career over the last ten years. Chances are, it's a lot.

Now, what if you could receive such a letter from yourself now, written by you ten years in the future? What kind of career changes and new skills might that future version of yourself promise are coming?

It's impossible to fully predict what impact any ten-year period might have on a job. Only with retrospect can you consider what you'd share with a version of yourself ten years in the past. How much of it would your past self have been able to anticipate?

But once in a while something comes along that is so game-changing that we can immediately recognize it as something we're going to talk about in that letter. Without question, one of those things is generative artificial intelligence. Just a few years ago, as we were preoccupied with pandemics and economic turmoil, we scarcely could have predicted that right around the corner was a technology that would be as accessible as it is powerful, so much so that it would quickly open up entirely different economic concerns for a huge range of professional roles. Suddenly, instead of tradespeople and professional drivers worrying that robots are coming for their jobs, it was professional knowledge workers and the white collar workplace that was being disrupted by machines.

As project managers, we are squarely in this category of professionals who are impacted by the advent of generative artificial intelligence (gAI). The things gAI is good at – analyzing data, repetitive cognitive tasks, creating and summarizing information – lie directly in the path of the project manager's daily duties. The world of project management is already being disrupted, as gAI becomes a standard onboard feature of the tools we use every day, like Microsoft Office, Atlassian's Jira and Trello, ERP systems like Dynamics365, and many others. Huge swathes of project management work stand to be either replaced or augmented by gAI.

So the question is, what does gAI mean for our careers in project management? In ten years, will we look back and say it was a game-changing tool that supercharged our ability to do our jobs in completely new ways? Or will we look back and realize that robots came for our jobs - reproducing the value we deliver at a fraction of the cost and automating away the things we used to do every day?

Obviously it's a rhetorical question. We need to learn how to leverage what generative AI has to offer in ways that augment, assist, and enhance our roles as project managers. That's the goal of this class.

1.1 Aligning our Expectations

This two-day class is designed for experienced project managers in enterprise environments. The class provides a comprehensive understanding of how generative AI can be applied in project management, covering AI capabilities, limitations, and practical tool integrations. Attendees will engage in hands-on exercises to explore AI applications in project lifecycle stages, risk and stakeholder management, and reporting. The course also addresses ethical considerations and data privacy in AI-assisted projects. By the end of day 2, you will be ready to apply a more AI-enabled project management approach to your work, applicable across various frameworks and tools.

1.2 What to expect from this class:

- Flexibility, conversations, and development of foundational AI literacy
- Practical guidance on applying high-level generative AI principles across a broad range of scenarios and use cases that a project manager will likely find valuable
- Explanation of logical linkages between conventional project management practices and recent AI technologies that can be applied in project management contexts
- An opportunity to practice using a variety of generative AI tools in real-world scenarios and exercises you work through yourself, helping you identify and apply AI where it will be most useful to you
- Knowledge sharing and discovery with your peers

1.3 What not to expect from this class:

- A prescriptive, one-size-fits all approach to either using generative AI or following a rigid AI-enabled project management process
- An exhaustive reference of highly specific or detailed project management use cases
- Extended technical discussions or deep focus on any specific tool or technology
- Perfect solutions that work for everyone
- Silver bullets, panaceas, or big overnight transformations
- Project management principles 101 – we assume you already have extensive experience and knowledge in managing large scale projects

Gartner says 80 percent of today's project management tasks will be eliminated by 2030 as artificial intelligence takes over.

"AI is going to revolutionize how program and portfolio management (PPM) leaders leverage technology to support their business goals.

Right now, the tools available to them do not meet the requirements of digital business."

- *Daniel Stang, Gartner Research Vice President*

  2019

1.4 Learning objectives for this class

By the end of this class, you should be able to:

- Understand how generative AI impacts project management.
- Identify AI automation opportunities within your projects.
- Integrate AI tools effectively with existing project management software.
- Enhance communication and reporting using AI capabilities.
- Manage ethical and data privacy aspects in AI-assisted projects.
- Apply AI in various stages of the project lifecycle.
- Navigate AI applications in risk and stakeholder management.
- Develop a strategy for AI implementation in project environments.
- Utilize AI for improved decision-making and efficiency.
- Implement practical AI solutions and strategies in your workplace.

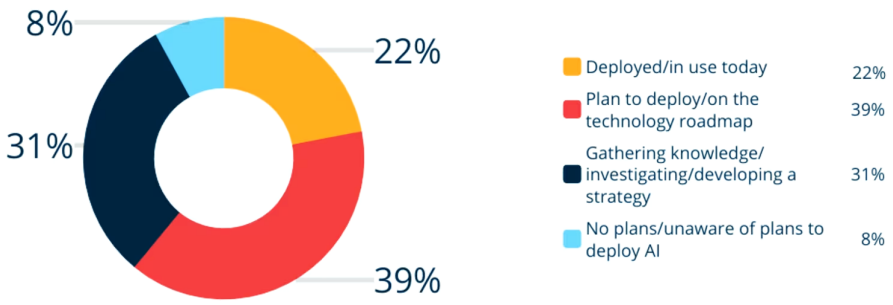
1.5 Your contributions are important!

Active participation in this class, your own insights and ideas, and project management experience from your professional world will be of great help from your side. Together, we'll explore the possibilities that generative AI brings to our field, and ensure you leave this class with the knowledge and skills that set you apart as an AI-enabled project manager. You should return to work confident of relevancy, applicability, and enrichment of your professional capabilities.

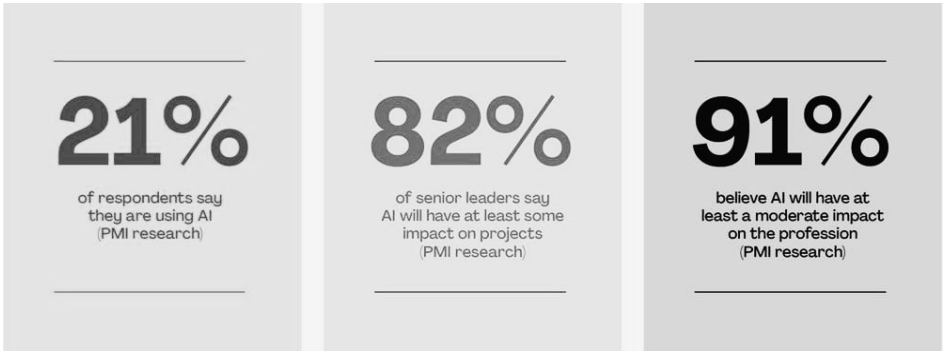
2. The Impact of AI in Project Management

Generative AI has the potential to transform project management, from the automation of everyday activities to providing strategic insight that feeds decision making. We want to understand how AI can be used for things like improving project results, decreasing risks, assisting us with communication, and supporting innovation. But perhaps more importantly, we want to understand how AI can **save us time in our jobs and assist us with our daily work, no matter what we're working on that day.**

According to survey research by software marketplace platform Capterra, the majority of project managers are either already using AI in their work, or are planning to soon.



Source: Capterra 2023 AI in PM Survey.
Question: "Which describes the use and future plans for AI in your overall company?"



2.1 How can AI help the project manager?

Generative AI presents an opportunity to augment enterprise project management by enhancing decision-making, optimizing resource allocation, and improving overall efficiency.

Some of the most obvious value propositions are:

Efficiency and Automation of Routine Work: Generative AI can automate routine and time-consuming tasks within project management, such as scheduling, reporting, and data entry. This automation not only reduces the workload on project managers, allowing them to focus on more strategic tasks but also minimizes human error, ensuring more accurate and reliable execution of project management work.

Predictive Analytics and Risk Management: By leveraging historical data, generative AI can provide predictive insights, forecasting potential project risks and bottlenecks before they occur. This foresight enables proactive risk management, allowing project teams to mitigate issues before they impact the project timeline or budget.

Resource Optimization: Generative AI can analyze vast amounts of data to optimize resource allocation, ensuring that human and financial resources are utilized in the most effective manner. This optimization can lead to cost savings and more efficient project delivery.

Enhanced Collaboration and Communication: AI can facilitate better communication and collaboration across project teams, including stakeholders in different locations or time zones. By generating real-time updates and reports, AI ensures that all team members have access to the latest project information, enhancing coordination and decision-making.

Better Stakeholder Engagement: AI tools focusing on communication can also lend a personal touch in stakeholder interaction so that all information required to update stakeholders or any other may always be timely and effective for fostering a greater level of stakeholder relationship.

Problem-Solving: Generative AI can simulate various project scenarios and outcomes, enabling project managers to explore a wide range of strategies and solutions. This capability supports more innovative problem-solving and strategic planning, potentially leading to more successful project outcomes.

Scalability: As enterprises grow, managing multiple large-scale projects simultaneously can become increasingly complex. Generative AI's scalability allows it to manage the growing volume of project-related data and tasks, ensuring that project management processes remain efficient and effective, regardless of the size or number of projects.

2.2 The Resulting Impact:

Increased Efficiency: With increased routine elimination on the one hand and greater overall efficiency in terms of any particular project, AI permits the project manager to get more done in less time.

Better Accuracy: AI minimizes human possibility for error on activities like analysis and reporting of data to give better accurate insights and results out of the project.

Improved Resource Utilization: Owing to forecasting nature system, usage of AI allows improved utilization of resources in effective placement of time, budget, and people scenario for maximum usage.

Strategic Advantage: The projects that effectively use AI can deliver competitive advantage, more innovative solutions, and achieve objectives faster and more effectively.

By incorporating AI into practice, project managers are not only upgrading their toolkit but also pushing their projects to another level of accomplishment in an ever more challenging world of complexities, competing needs and priorities, finite resources, and overwhelming data streams.

2.3 AI myths vs. reality

The growing conversation around generative AI makes it clear the technology is being seen as a new frontier, promising efficiency and innovation. Yet, amidst this enthusiasm, misconceptions have emerged. It's worth taking a moment to address them.

First, the idea that AI could autonomously manage projects from start to finish is more fiction than fact. True, AI excels in tasks like scheduling and data analysis, but the core of project management—leadership, negotiation, conflict resolution—remains distinctly human. AI is a tool to enhance, not replace, the project manager's role.

The belief that AI's analytics could make human expertise redundant also overlooks a crucial point. AI, for all its capabilities, lacks the nuanced understanding that comes with human experience. It provides data-driven insights, yes, but applying these insights effectively demands human judgment. Even with advanced algorithms, and excellent training data, AI is susceptible to errors, particularly with ambiguous or underrepresented data. It's essential for project managers to critically assess AI recommendations, balancing them with other sources of information.

The path forward involves realistic expectations:

- **Augmentation, Not Replacement:** View AI as a tool to augment capabilities, not as a standalone solution.
- **Collaborative Intelligence:** Effective AI integration comes from pairing human expertise with machine efficiency.
- **Continuous Oversight:** AI in project management demands ongoing human supervision to ensure relevance and accuracy.
- **Flexibility and Adaptability:** AI tools must be tailored to fit the unique needs of each project and align with existing systems.
- **Ethical and Responsible Use:** Ethical considerations, particularly around data privacy and bias, are paramount.

By addressing these misconceptions, project managers can leverage AI effectively, enhancing their work without overlooking the human touch that defines their profession.

3. Large Language Models: The engines of generative AI

Understanding the basics of Large Language Models (LLMs) and how to leverage them effectively is key. LLMs and their associated machine learning models such as GPTs (Generative Pre-trained Transformers) are advanced AI systems designed to understand, generate, and interact with human language in a way that's remarkably intuitive and versatile. LLMs are trained on vast datasets of text from the internet, books, articles, and more. This training allows them to recognize patterns, contexts, and nuances in language, enabling them to generate coherent and contextually relevant text based on the input they receive.

Unlike simpler machine learning models that might only categorize or identify information, LLMs can generate new text and content. This means they can draft emails, write reports, or even create project documentation based on guidelines or prompts given to them. They can understand and respond to queries, making them excellent for interactive applications like chatbots or virtual assistants. They can also provide real-time assistance to project teams, answering questions, offering suggestions, or pulling information from project documents.

For the project manager, these strengths are well-suited to applications we might find useful, such as:

- **Automated Documentation:** LLMs can assist in generating project-related documents such as project plans, status reports, and risk assessments, saving significant time and effort for project managers.
- **Enhanced Communication:** LLMs can be integrated into communication platforms to provide real-time language translation, summarize lengthy discussions or documents, and even draft communication based on key bullet points, ensuring clear and effective project communication.
- **Knowledge Management:** LLMs can sift through extensive project archives and databases to surface relevant information, previous project learnings, and best practices, aiding in informed decision-making.
- **Training and Onboarding:** With their ability to generate educational content, LLMs can assist in creating customized training materials for new project management tools, methodologies, or project briefs, enhancing team capabilities and project alignment.
- **Risk Analysis and Problem Solving:** By analyzing project data and historical trends, LLMs can identify potential risks or suggest creative

solutions to complex project challenges, supporting proactive project management.

3.1 Practical Considerations of working with LLMs

- **Integration:** LLMs can be integrated into existing project management software and tools, enhancing their capabilities without disrupting workflows.
- **Customization:** While LLMs like GPT come pre-trained, they can be further fine-tuned or customized to better understand the specific language, acronyms, and nuances of your organization or industry.
- **Data Security:** It's crucial to consider data privacy and security, especially when dealing with sensitive project information. Solutions can include using LLMs in controlled environments or opting for versions that can be hosted on private servers.

Chat GPT-4 is one of the most advanced LLM systems as of January 2024.

- 45 terabytes of training data (before compression)
- 1.8 trillion parameters
- 1,000+ A100 GPUs
- $100 million to train (according to Sam Altman)

In sum, Large Language Models offer a powerful suite of capabilities that can automate routine tasks, enhance decision-making, and improve communication within enterprise project management, ultimately driving efficiency and innovation in project execution.

Here are a few basic tips for project managers as they integrate LLMs into their workflow:

- **Grasp of Capabilities and Limits:** Understand the strengths and weaknesses of LLMs. They excel at tasks like text generation and data synthesis but may falter when context or specialized knowledge is crucial. Knowing these limits can streamline task allocation.
- **Precision in Communication:** When engaging with LLMs, clarity is paramount. Craft prompts that are straightforward and devoid of ambiguity to ensure relevant outputs. For instance, a direct request for a progress report with specific details will yield better results than a broad, undefined query.
- **Iterative Engagement:** Interaction with LLMs is rarely a one-shot affair. Outputs may need refinement; thus, adjusting inputs based on initial results can enhance accuracy and relevance.
- **Tool Integration:** Harmonizing LLMs with existing project management software, such as Microsoft Project or JIRA, can significantly boost efficiency. This integration enables seamless synthesis of insights generated by LLMs into the project's workflow.
- **Data Ethics:** When deploying LLMs, vigilance around data privacy and security is crucial, especially with sensitive project data. Align LLM use with both organizational protocols and broader regulatory standards.

- **Adaptive Learning:** The AI landscape is dynamic. Staying abreast of advancements and adapting strategies accordingly can position project managers at the forefront of AI application in project management.

Leveraging LLMs should be a team endeavor. Cultivating a culture that values shared learning and innovative thinking can elevate the entire team's capacity to engage with AI tools effectively.

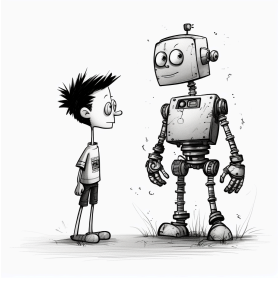
LLMs are not merely one-way conduits of information but are capable of dynamic, two-way interactions, making them invaluable for nuanced tasks like risk analysis or stakeholder engagement simulations. This interactive capability allows for iterative queries and refinements, making LLMs adaptable allies in project management.

3.2 Interacting with LLMs - Using a dialectic approach

Approach interactions with an LLM as a conversation.

We primarily interact with LLMs using what we'll call a "dialectic approach," meaning that we should always approach interaction with an LLM as a conversation, anticipating that we may not get what we need from the AI tool in just one exchange – it will likely require a series of exchanges so we can establish context, help the AI learn what we need, and refine the direction of the conversation as we go. LLM tools don't just use machine learning to power their core features - they also learn as they go, adapting to our feedback in real time. This adaptation and ability to process feedback is critical to achieving real utility with an LLM tool.

This approach emphasizes the use of structured, thoughtful dialogue as a means to effectively interact with LLMs. By adopting clear, precise conversational guidelines, project managers can guide LLMs to generate valuable insights, solutions, and documentation relevant to their projects. This approach involves framing queries and prompts in a way that leverages the LLM's understanding of context and nuance, thus fostering a productive exchange of ideas. For instance, instead of vague requests, project managers can pose specific, goal-oriented questions or scenarios, enabling the LLM to apply its vast dataset in a focused manner. By iteratively refining questions based on the LLM's responses, project managers can navigate towards more accurate and useful outcomes, much like a strategic dialogue. This dialectic method ensures that interactions with LLMs are not just transactions, but collaborative efforts towards iterative problem-solving. Along the way, we build "layers" of context and framing which help the LLM behave with more situational awareness, and less like a dumb robot that simply regurgitates generic information contained in its default training dataset.



Large language models are ready to talk with you!

To optimize this two-way interaction, project managers should:

- Initiate with comprehensive context to guide the AI's understanding and responses.
- Employ iterative refinement to hone in on precise information, leveraging the AI's initial outputs to refine subsequent queries.
- Establish feedback loops to improve the AI's accuracy and relevance over time.

Understanding and utilizing this dynamic interaction with LLMs can significantly amplify their utility in managing complex projects, providing a responsive and adaptable tool that better aligns with the intricacies of our project management work. Embracing a dialectic method can significantly enhance project managers' interactions with LLMs, especially in complex project settings where depth and adaptability in problem-solving are essential.

Key Practices for Dialectic Engagement with LLMs:

- **Clarity and Precision:** Start by clearly defining your needs. Precise language helps avoid misinterpretations, ensuring responses are aligned with your objectives.
- **Contextual Framing:** Provide comprehensive background information. Detailing the project's scope and challenges helps the LLM understand the specific context, leading to more relevant outputs.
- **Iterative Questioning:** Use the LLM's responses as a springboard for further inquiries. This back-and-forth sharpens the focus, gradually honing in on the most pertinent insights.
- **Critical Evaluation**: Scrutinize the LLM's replies for their practical application and accuracy. This ensures the integration of AI insights into project decisions is both meaningful and constructive.
- **Feedback Loops:** Offer feedback on the utility of the LLM's responses. This input can refine the model's future performance, making it a more effective tool over time.
- **Ethical Considerations:** Stay mindful of ethical aspects, especially regarding content use and data handling. Ensuring ethical interactions preserves integrity and compliance.

By adopting these principles, project managers can effectively leverage LLMs, turning these machines into “power tools” that contribute valuable assistance to our work.

3.3 The Role of Context in AI Interactions

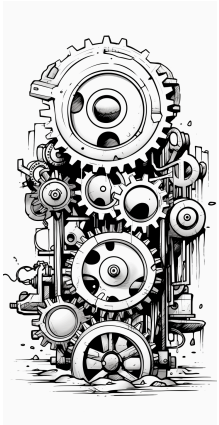
In dealing with AI tools, context is everything. For LLMs to be truly effective, they require an understanding of our project's specifics, as well as the specifics of what

we need to get out of them. This encompasses the project's objectives, the team dynamics, specific challenges, and industry or product nuances.

Strategies for Contextualization:

- **Comprehensive Briefing:** Initiate interactions with a detailed overview of your project. Include essential aspects like scope, goals, and current challenges to give the AI a solid foundation to work from.
- **Relevant Data Inclusion:** Provide the AI with pertinent data, from project timelines to stakeholder feedback. Rich data input leads to more nuanced and applicable outputs.
- **Continuous Updates:** Keep the AI informed about new developments and shifts in the project landscape. This ensures its contributions remain relevant and aligned with the project's evolving needs.
- **Feedback Mechanisms:** Establish a feedback loop to assess the AI's outputs. Refine the provided context based on this feedback to enhance the AI's understanding and effectiveness.
- **Ethical and Privacy Considerations:** When sharing information with the AI, ensure adherence to ethical standards and data privacy regulations. Protecting sensitive information is paramount.

Effectively establishing context not only improves the relevance of LLM outputs but also ensures these insights are actionable within the specific framework of your project. This tailored approach enhances the symbiosis between project managers and AI tools, all based on the quality of our conversation skills.



4. Automation Fundamentals: Understanding what machines are good at

Automation in project management – or any other job role – involves the use of technology to perform routine tasks without human intervention. The concept of automation should be well understood as a foundation for using AI, since AI is first and foremost a machine we use to automate things.

For the project manager, opportunities to automate can include tasks like data processing, reporting, task assignments, and communication among team members. You may not need AI to do so. By integrating automation, project managers can encourage consistent and error-free execution of tasks, leading to improved accuracy and reliability. But above all, automation is about saving time.

Let's compare a few of the strengths and weaknesses of machines compared to us humans.

4.1 Human Attributes	4.2 Machine Attributes:
Strengths: • Instinctive judgment • Creativity • Emotional perception, • Context-sensitive understanding • Versatility • Task switching (sort of) **Challenges:** • Susceptibility to fatigue • Limitations in scaling • Error-prone, especially in monotonous or repetitive tasks	**Strengths:** • Handling repetitive actions • Analyzing vast data sets • Consistent performance • Tireless operation • Scalability **Limitations:** • Lack of instinctive understanding • contextual recognition, • emotional discernment • Limited flexibility in untrained scenarios

4.3 Identifying High-Potential Automation Use Cases

To effectively harness the power of automation, you should conduct an assessment of normal work processes to identify areas with high automation potential. Key criteria for an automation use case include one or more of the following:

- **Repetitiveness:** Tasks performed frequently and with little variation are prime candidates for automation.
- **Time-Intensity:** Processes that consume significant amounts of time yet add limited value should be automated to free up resources.

- **Complexity:** Simple tasks with clear rules and outcomes are easier to automate and can provide immediate benefits.
- **Impact:** Focus on automating tasks that have a direct positive impact on project goals, customer satisfaction, and the bottom line.

4.4 Implementing Automation Solutions

Once potential automation use cases are identified, project managers should:

- **Prioritize:** Rank automation opportunities based on potential impact, feasibility, and cost-effectiveness.
- **Select Tools:** Choose the right automation tools and technologies that align with the project's needs and organizational capabilities.
- **Pilot:** Implement automation in a controlled environment to validate its effectiveness and make necessary adjustments.
- **Scale:** Gradually expand the use of automation across the project and organization, ensuring continuous monitoring and optimization.

Embracing automation offers project managers a strategic advantage in managing complex projects and achieving superior results. By systematically identifying and implementing automation opportunities, project managers can enhance efficiency, reduce risks, and create a more agile and responsive project management framework. As the business landscape continues to evolve, the ability to leverage automation will be a key differentiator for successful project management professionals.

4.5 Pinpointing Opportunities for Automation

Taking things a step further, let’s consider automation opportunities which lend themselves well to generative AI.

- **Routine Tasks:** Ideal for AI, especially if repetitive and pattern-based.
- **Data-Intensive Analysis:** AI excels at processing and interpreting large data for trends and predictions.
- **Standardized Operations:** AI efficiently manages tasks with set standards or sequences.
- **Creativity Limits:** AI shows creativity in known patterns but may not replace deep, novel human insights.
- **Stable Environments:** Best suited for consistent tasks with minimal changes.
- **Error Tolerance:** Suitable for tasks where minor inaccuracies are acceptable, though critical tasks might need human oversight.
- **Large-Scale Tasks:** AI handles high-volume tasks effectively, offering cost benefits.

- **Integration Ease:** Successful AI deployment depends on its compatibility with existing systems.

To begin automating with gAI, start with a basic task analysis within your project scope. Spot the repetitive tasks that are essential yet monotonous, such as data entry, scheduling, and updating statuses—prime candidates for automation.

Next, look for tasks swamped in data, where AI can swiftly sift through, analyze, and offer insights. This includes identifying trends, risks, and measuring performance metrics. The AI tool may not be able to do everything - but it can often get you started.

Given their foundation in language processing and written content generation, communication and reporting tasks are great applications for generative AI, especially routine updates and standard reports. Again, the AI tool may not be able to completely automate these responsibilities, but there are almost always ways to streamline them with AI, saving valuable time. Besides generating outbound communication, consider automating feedback collection processes, like stakeholder surveys or team reviews, to consolidate insights more efficiently. Generative AI is great at ingesting, analyzing, and summarizing information based on written language.

With some potential automation areas identified, prioritize based on the potential to boost efficiency, ease of AI integration, and anticipated return on investment. Initiating automation with simpler tasks can serve as quick wins, building confidence in AI's capabilities and setting the stage for tackling more complex areas.

4.6 Potential Pitfalls

Be mindful of the data quality AI will work with, the possibility of needing tailored AI solutions, and the imperative of keeping human oversight, particularly in decision-making. Address ethical considerations such as data privacy and the impact on jobs, ensuring AI's role is to augment the team's capabilities, not undermine them.

4.7 Identifying AI-Ready Processes

With some of these baseline considerations in place, let's play around with opportunities to automate. We'll practice this together in class, and of course you'll want to spend time on your own thinking in depth about your own automation use cases. See if any of these situations come readily to mind:

- Data-heavy tasks are ripe for AI, given its prowess in digesting and interpreting vast data sets for trend spotting, performance tracking, and risk evaluation.
- Routine, repetitive tasks that follow a set pattern are also ideal for AI automation, allowing human resources to focus on strategic aspects.
- AI can contribute to complex problem-solving by bringing innovative solutions to the table, drawing from data analyses and precedents.
- Personalizing stakeholder communications through AI can enhance engagement by providing updates that resonate with individual interests and concerns.

As you gauge potential processes and tasks that might benefit from AI augmentation, be sure to:

- Assess how AI automation can enhance task efficiency, accuracy, and unearth new insights.
- Consider the technical and resource landscape required for AI integration and whether it aligns with available or attainable resources.
- Contemplate the change management aspect—preparing your team for workflow adjustments and new role dynamics.
- Account for ethical and security considerations, especially concerning data handling, to ensure compliance with regulations and ethical standards.
- Start with pilot projects to test the waters, allowing for tweaks and refinements before a full-scale rollout.
- Equip your team with the necessary training and support to adapt to AI-enhanced workflows, ensuring a smooth transition and confident use of new tools.
- Keep a close eye on the performance of AI-automated processes, seeking feedback from all stakeholders to gauge the impact on project efficiency and outcomes.

4.8 Evaluating the Impact of Automation

As we look for ways to leverage the strengths of automation using AI, we ultimately want to produce these benefits:

- **Efficiency Gains:** Look at operations to pinpoint where automation could cut down on manual work and speed up project timelines. Focus on current bottlenecks and envision the ripple effect their automation could have on the project's flow.
- **Quality and Accuracy:** Consider the role of AI in elevating the quality and precision of project deliverables, from nuanced data analysis to predictive forecasting and detailed reporting.
- **Innovation and Edge:** Reflect on how embedding automation could inject innovation into your project management practices, potentially setting your project apart in a competitive landscape.

4.9 Is it Feasible?

Once we've identified them, AI automation use cases also have to be implemented in a practical way. In addition to the suitability of the specific use case itself, here are a few considerations that are also in play when evaluating feasibility:

- **Technical Infrastructure:** Gauge the readiness of your existing technical setup to embrace AI automation, including the requisite software, hardware, and data frameworks. You may need to engage subject matter experts or functional technology stakeholders for this one. (If you're going to be a successful AI-enabled PM, it won't be the last time!)
- **Team Preparedness:** Assess whether your team is equipped to work alongside AI tools. Identify skill or knowledge gaps that need bridging, possibly through targeted training or strategic hiring.
- **Cultural Fit:** Verify that your organizational culture is primed for AI adoption, supported by leadership and a general team openness to technological evolution.
- **Financial Consideration:** Undertake a thorough cost-benefit analysis to weigh the financial investment against the projected long-term gains of AI integration.

4.10 Strategic Implementation

Finally, there's the overall strategic impact to consider. As you roll out AI-assisted automation, make sure you cover your bases on these items in order to sustain success, especially at scale.

- **Pilot Initiatives:** Start small with pilot projects to test the waters of automation, allowing for real-world insights and necessary course corrections before broader application.
- **Stakeholder Involvement:** Keep key stakeholders in the loop about automation endeavors, securing their support and addressing any reservations upfront.
- **Ongoing Optimization:** After deployment, keep a close watch on the automated systems, employing performance metrics and stakeholder feedback to continuously refine and enhance the setup.

By methodically assessing both the impact and the practicality of introducing automation, project managers can make well-informed decisions about weaving AI into their project landscapes, ensuring that such efforts are well-aligned with overarching project goals and poised to deliver substantial benefits.

Now it's time to play around with your own use cases.

Ex. 1 Group Exercise: Identifying Automation Use Cases in Project Management

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Starter Examples:

Risk Management: Explore automating the detection and evaluation of project risks by leveraging AI to sift through both internal project data and external sources, identifying potential issues before they escalate.

Stakeholder Communication: Consider the use of AI to craft regular updates for stakeholders, tailored to their specific interests and concerns, ensuring that communication is both efficient and engaging.

Task Scheduling: Discuss the potential for AI to enhance project scheduling, taking into account various factors such as resource availability, task dependencies, and other project constraints to optimize timelines.

Guidance for Effective Group Discussion:

Start Simple: Focus initially on tasks that are straightforward and currently manual yet repetitive. Evaluate how these tasks might be transformed through AI, leading to greater efficiency.

Leverage Data: Concentrate on areas within your domain that already involve data collection. AI's strength lies in its ability to process and analyze data, so think about how you can utilize existing data to drive AI applications.

Enhance Interactions: Reflect on tasks involving frequent interactions with stakeholders. Discuss how AI could streamline these processes, making communications more targeted and efficient.

5. Dialectic Rules & Prompting

The skill of prompt engineering is essential for project managers working with generative AI tools. Prompting, in this context, involves crafting targeted queries or commands to direct AI systems towards producing outputs that are both relevant and actionable for specific project management tasks. This capability is not just about issuing instructions; it's a strategic skill that blends understanding project requirements with the nuances of AI communication. Effective prompting can significantly enhance the utility of AI as we use it in our work.

This part of the guide is designed to equip you with good practices for developing prompts that align closely with your project objectives, ensuring that the AI's responses are not only accurate but also immediately applicable to your project's needs.

5.1 Guidance from PMI on prompting:

Aspect of Use	Description
Tailoring Prompts	For effective interaction with ChatGPT, prompts should be clear, specific, concise, and scoped. Adjust your questions based on the AI's responses to refine the information received.
Example Prompt Format	A guideline for constructing prompts might be: "Act as a {role}. {Question} with {action} using a {tone}." This format helps in setting the context for the AI to generate more relevant responses.
Output Formats	ChatGPT can produce outputs in various formats including plain text, ASCII art, HTML code, JavaScript code, CSV files, and structured tables. This versatility allows for a wide range of applications in project management.
Project Management Tasks	ChatGPT can assist with a multitude of project management-related tasks such as decision-making, creating persuasive business cases, drafting project charters, managing scope creep, conducting detailed risk analyses, and more. For each task, specific prompt examples are provided, such as conducting cost-benefit analyses, creating business cases with clear ROI, drafting project charters with comprehensive details, and managing scope creep with a requirements traceability matrix.
Additional Deliverables	Beyond specific tasks, ChatGPT can be utilized for problem-solving, innovation and idea generation, competitive analysis, project summarization, decision-making, drafting business cases, project charters, statements of work (SOWs),

	requests for proposal/information/quote (RFP/RFI/RFQ), briefing notes, resource allocation plans, stakeholder management plans, project management plans, procurement and contract management, budgeting and financial forecasting, communication plans, and various other project documents.

5.2 Prompting basics in plain English

1. Initiate with comprehensive context to guide the AI's understanding and responses.
2. Employ iterative refinement to hone in on precise information, leveraging the AI's initial outputs to refine subsequent queries.
3. Establish feedback loops to improve the AI's accuracy and relevance over time.
4. Include details in your query to get more relevant answers
5. Ask the model to adopt a persona
6. Use delimiters to clearly indicate distinct parts of the input
7. Specify the steps required to complete a task
8. Provide examples
9. Specify the desired length of the output

5.3 Bad prompt examples

Vague Query: Tell me about agile project management.

- Lacks specificity and context.

No Persona Adoption: How do I manage projects?

- Doesn't specify the AI to adopt the role of an experienced project manager.

Unclear Delimiters: What are the risks in project management and how to mitigate them, also tell me about team management.

- Combines multiple questions without clear separation.

No Steps Specified: How do I implement an ERP system?

- Lacks detail on the desired process or steps.

No Examples Provided: How do I improve team efficiency?

- Doesn't provide context or examples to tailor the response.

No Output Length Specified: Give me a project report.

- Doesn't specify desired length or detail for the report.

5.4 Good Prompt Examples

Detailed Query: "I'm an agile project manager implementing a new ERP system. What are key considerations for integrating existing customer data into the new system?"

- Provides specific context and details.

Persona Adoption: "Act as an experienced agile project manager. What strategies would you suggest for maintaining team morale during the stressful final stages of an ERP implementation?"

- Directs the AI to adopt a specific role.

Clear Delimiters: "Identify the top 5 risks in agile ERP implementation | Provide methods to mitigate each risk."

- Clearly separates two parts of the prompt.

Steps Specified: "Outline the steps for conducting a sprint retrospective in an ERP project."

- Asks for a specific, step-by-step process.

Examples Provided: "Considering challenges like scope creep and resource constraints, which I've faced in previous projects, how can I better manage project scope in my current ERP implementation?"

- Includes examples for context.

Specifying Output Length: "List in bullet points, no more than 10, the key metrics I should track during an ERP system implementation."

- Specifies the format and length of the response.

Key terms:

System Message
Personality
Scope
Response Format
Recency Bias
Priming the Output
Syntax
Markdown/XML
Few-Shot Learning
Chat Completions API
Adapting to New Tasks
Contextual Examples

Ex. 2 Practice: Prompting Basics

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5.5 Chained Prompting

Technique of either sequentially linking multiple prompts in one input, or using multiple related prompts to generate progressively elaborated output. This approach simulates a continuous dialogue or progressively builds on prior responses. **Why is chained prompting important?**

- **Dynamic Handling:** Latest AI models, like GPT, efficiently manage chained prompts for context-rich responses.
- **Enhanced Precision:** Using connected prompts leads to more accurate, relevant answers.
- **Customization:** Chained prompts allow for tailored interactions, aligning with user-specific needs.

Chained Prompts: An agile project management example:

1. **Initial Prompt for Agile Project Management Context:** As an agile project manager, can you assist me in developing a framework to identify and implement effective uses of the AI tool that could enhance team productivity and streamline agile processes?
2. **Organizing the Framework by Agile Roles:** Thanks! Now could you structure this framework by the specific roles within an agile team? Please include the most relevant criteria for each role on how they can leverage the AI tool to optimize their workflow and responsibilities.
3. **Expanding into a Checklist:** Now, for each of the roles identified in the framework, can you elaborate on each point to create a detailed checklist? This checklist should guide team members on how to effectively apply the AI tool in their specific roles. Let's start with the first role.
4. **Providing Specific Examples:** Great - For the checklist items you've provided for each role, can you add specific examples or scenarios where the AI tool would be particularly beneficial in an agile setting? These examples will help team members better understand practical applications.
5. **Reformatting into a Table:** Thanks! Can you now reformat the content into a table format for clarity and ease of use? The table should categorize information by role, criteria, checklist actions, and examples.

Ex. 3 Practice: Chained Prompting

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Instructions: Practice chaining prompts using an AI agent of your choice. Try chaining input together in one prompt only, as well as using a series of related prompts to progressively elaborate a topic in an ongoing conversation with the AI. Share prompts, outputs, conversations, or just general observations in your room's Miro space.

5.6 More sophisticated prompt techniques

Let's go over some proven best practices for employing more sophisticated prompt techniques. In the remainder of this section, we will go through how to use these techniques. These techniques have been established by the developers of top generative AI tools (OpenAI, Microsoft, etc.) as some of the best ways to get the best possible output from LLM-powered generative AI tools.

- **System Message**
- **Repeating the instructions**
- **Priming the output**
- **Clear syntax**
- **Few shot learning**
- **Auto-generated chain of thought**
- **Choice Shuffle Ensembling**

5.7 Level-Set with The System Message

The system message is a crucial element at the start of a prompt that sets the stage for the interaction with the model by providing context, instructions, or relevant information tailored to the specific use case. It can outline the assistant's personality, stipulate the scope of the model's responses, and establish response formats. For instance, if you instruct the assistant to adopt a rhyming response style or to admit when it lacks information, this shapes how the model interacts with users.

For example, if the system message informs the assistant that it assists in project management by offering advice in a friendly manner, and to clarify when a query is outside its knowledge base, the interaction might go as follows:

- **System Message:** "You are an AI assistant designed to offer project management advice in a friendly manner. If unsure about a query, ask for more details."
- **User:** "How should I deal with project delays?"
- **Assistant:** "Delays can throw a wrench in project timelines. First assess the delay's cause with your team. Then communicate and adjust your timeline accordingly. You may be able to adjust the critical path or crash the schedule if the situation permits."

5.8 Repeat Instructions for Enhanced Clarity

Due to the **recency bias** inherent in models, information positioned at the end of a prompt often wields greater influence on the output. This phenomenon suggests that reiterating critical instructions or guidelines towards the prompt's conclusion could enhance the model's adherence to desired response parameters. In practice, project managers might find it beneficial to restate key instructions or objectives at

the end of a prompt to ensure the generated advice or analysis aligns closely with the instruction's requirements.

5.9 Priming the Output for Specific Formats

Introducing specific words or phrases at a prompt's conclusion can effectively "prime" the model to deliver responses in a desired format. For instance, hinting at the expected structure, like "Provide a step-by-step guide:", encourages the model to format its response accordingly. In project management, this technique could be used to solicit structured responses, such as action plans or risk assessments, in a clear, step-by-step format. **Example:**

- **System Message:** "You are an AI that offers concise project risk evaluations. End with a brief summary."
- **User:** "We're integrating a new software system. What are the risks?"
- **Assistant:** "Integration complexity, system compatibility issues, data migration challenges. In summary, potential risks include technical and compatibility issues."

5.10 Incorporating Clear Syntax for Precision

Employing distinct syntax, such as punctuation, headings, and separators, can significantly clarify the prompt's intent and improve the readability of responses. In project management contexts, using clear demarcations like '---' to separate sections or uppercase for headings can help delineate questions from answers or different stages of a project plan. This structured approach not only aids in comprehension but also in generating concise, relevant outputs.

Example:

- System Message: "You are an AI assisting in project planning. Use headings for each project phase."
- User: "Outline the phases for a software development project."
- Assistant: "--- INITIATION: Define scope and objectives. --- PLANNING: Develop a detailed project plan. --- EXECUTION: Implement the project plan. --- MONITORING: Track project progress. --- CLOSURE: Finalize and review project."

Utilizing Markdown or XML syntax can further refine outputs, leveraging the model's extensive training on web content structured in these formats. For project managers, adopting these formatting standards could ensure that generated content, such as project documentation or status updates, is both well-organized and easily integrable into project management tools and platforms.

5.11 Few-Shot-Learning

Few-shot learning is a machine learning framework that enables AI models to make accurate predictions even when provided with a very small number of labeled examples. This approach is particularly useful for training models in scenarios where suitable training data is scarce.

Here are the key points about few-shot learning:

- **Adapting to New Tasks:** When faced with novel tasks, language models can leverage few-shot learning. Instead of relying on extensive training data, they learn from just a handful of examples.
- **Contextual Examples:** In few-shot learning, a set of training examples is included as part of the prompt. These examples provide additional context to the model, allowing it to generalize and adapt effectively.
- **Chat Completions API:** For instance, consider our intelligent chatbot designed to assist users with tax-related queries. By using a series of messages between the user and the assistant, we can prime the model to respond in specific ways, emulate desired behaviors, and seed answers to common questions.

Now, let's illustrate this with a project management twist:

Suppose you're leading a large-scale software development project. You encounter a new challenge related to resource allocation. You can use few-shot learning by providing a small set of contextual examples—perhaps scenarios where resource allocation decisions were made successfully in the past. Here are a few other examples illustrating how you can use few-shot learning as a prompting technique:

Example 1: Risk Identification and Mitigation:

- **Scenario:** A project manager is working on a new product launch in a market that the company has not entered before, and there's limited historical data on potential risks.
- **Few-Shot Learning Application:** The project manager provides the AI model with a few examples of risk assessments from similar product launches in different markets, including the identified risks, the context in which they were identified, and the mitigation strategies employed. The AI uses this information to predict potential risks for the new market launch and suggest effective mitigation strategies.

Prompt: "Consider three past software development projects with the following risk factors identified: 1) Project Alpha faced significant delays due to dependency on an external API, 2) Project Beta encountered budget overruns from underestimated scope, and 3) Project Gamma had to navigate team turnover. Given the current

project, Delta, is similar in scope to Beta but also relies on an external API like Alpha, predict potential risks and suggest mitigation strategies based on these examples."

Example 2: Stakeholder Communication Personalization:

- **Scenario:** A project manager needs to communicate project updates to a diverse group of stakeholders, each with different interests and knowledge levels about the project.
- **Few-Shot Learning Application:** The project manager inputs a few examples of past communications that were well-received by similar stakeholder groups, highlighting the tone, level of detail, and focus areas. The AI model then generates personalized updates for each stakeholder group for the current project, ensuring the communication is engaging and informative.

Prompt: "Here are three examples of past stakeholder communications for different project scenarios: 1) Email update to investors on Project X highlighting ROI and market expansion, 2) Technical report to the engineering team on Project Y detailing integration challenges and solutions, 3) Newsletter to the entire company on Project Z celebrating milestones and team achievements. Given a new project, Project A, with a diverse group of stakeholders including investors, engineers, and company-wide employees, generate personalized communication strategies for each group based on these examples."

Example 3: Problem-Solving in Project Tasks:

- **Scenario:** The project team faces a unique technical challenge that disrupts the project timeline, and there's no straightforward solution based on the team's past experience.
- **Few-Shot Learning Application:** The project manager provides the AI with a few examples of how the team has approached and solved different but somewhat related technical challenges in the past, including the problem context, the innovative solutions devised, and the outcomes. The AI model analyzes these examples and suggests several novel approaches the team could consider to tackle the current challenge.

Prompt: "Imagine three past projects with unique challenges: 1) Project 1 solved a data encryption issue through a novel algorithm, 2) Project 2 overcame hardware limitations by leveraging cloud computing, and 3) Project 3 improved user experience by integrating AI-based feedback loops. Given the current project faces a challenge in processing large datasets efficiently for real-time analytics, use these examples to brainstorm potential innovative solutions."

These prompts incorporate few-shot learning by providing the AI with a small set of contextual examples from which it can generalize and apply insights to new, similar tasks. This approach is particularly useful for project managers in situations where direct precedents may not exist.

5.12 Auto-Generated Chain of Thought

"Auto-Generated Chain of Thought" as a prompting technique can be a very effective way to get more sophisticated and accurate output from AI models, particularly in complex problem-solving domains. AGCOT enables the AI to articulate its reasoning process in a series of logical, interconnected steps, much like a human expert would when tackling a multifaceted issue. This approach not only enhances the transparency of AI-generated solutions but also facilitates deeper understanding and trust. By employing AGCOT, project managers can gain not just answers, but also comprehend the AI's thought process behind those answers, ensuring that decisions are informed, rational, and easily explainable to stakeholders. **Here are a few examples:**

Example 1: Complex Decision-Making in Vendor Selection:

- **Scenario:** A project manager needs to choose the most suitable vendor for a critical component of the construction project from a pool of several candidates, considering multiple factors like cost, reliability, past performance, and delivery timelines.
- **Auto-generated Chain of Thought Application:** The AI model outlines its decision-making process step by step, initially evaluating each vendor against individual criteria, then weighing these factors according to the project's priorities, and finally recommending a vendor based on the aggregated scores. This transparent process allows the project manager to understand the rationale behind the AI's recommendation and make an informed decision.

Prompt: "Given the following criteria for selecting a vendor: cost efficiency, reliability, past performance, and delivery timelines, along with the following vendor options: Vendor A, Vendor B, and Vendor C, break down the decision-making process. Consider Vendor A has the lowest cost but average reliability, Vendor B has excellent past performance but longer delivery timelines, and Vendor C offers a balance between cost and reliability but with limited past performance data."

Example 2: Project Timeline Adjustment:

- **Scenario:** Unexpected delays in a phase of a software development project require a reassessment of the overall project timeline and resource reallocation.

- **Auto-generated Chain of Thought Application:** The AI breaks down the problem by first identifying the delayed tasks and their dependencies, assessing the impact of delays on subsequent phases, evaluating available resources for potential acceleration, and finally suggesting a revised timeline. Each step is clearly outlined, providing the project manager with a logical pathway that led to the AI's conclusion, facilitating trust in the AI's recommendation.

Prompt: "A software development project is facing a two-week delay in the design phase due to unexpected technical challenges. The project has subsequent phases for development, testing, and deployment, each tightly scheduled. Given the team's capacity for overtime is limited and external dependencies on testing phase completion, outline a step-by-step approach to reassessing the project timeline and propose adjustments to bring the project back on track while minimizing the impact on quality and team well-being."

Example 3: Resolving Team Conflicts:

- **Scenario:** Conflicts arise within a project team over task allocations, threatening to derail the project's progress.
- **Auto-generated Chain of Thought Application:** The AI model approaches the problem by first identifying the root causes of the conflict, considering team members' skills, preferences, and workload. It then explores potential solutions, such as task reallocation, mediation sessions, or additional support, and presents a reasoned pathway towards resolving the conflict, including the pros and cons of each solution.

Prompt: "A project team is experiencing conflict over task allocations, with Team Member A feeling overburdened with complex tasks while Team Member B feels underutilized. Both members have expressed dissatisfaction, impacting the project's morale and progress. Given Team Member A's expertise in frontend development and Team Member B's proficiency in backend development, provide a detailed pathway to address the conflict. Include steps for reassessing task allocations, potential mediation strategies, and measures to prevent similar conflicts in the future."

5.13 Choice Shuffle Ensembling

"Choice Shuffle Ensembling" is a prompting approach to enhance decision-making in AI reasoning.. By presenting AI models with a set of potential choices or solutions and then shuffling these options, we can explore a diverse range of outcomes and get more accurate answers. This method not only broadens the scope of AI-generated recommendations but also introduces a layer of creative

problem-solving that can help AI tools make better choices when presented with complex scenarios.

By employing Choice Shuffle Ensembling in prompts, the AI is encouraged to consider and recombine the provided options in various ways, leading to a more robust exploration of possible solutions. This approach can help project managers see beyond their initial preferences or assumptions, fostering more creative and effective problem-solving strategies. **Here are some examples:**

Example 1. Evaluating Project Management Tools

- Consider a scenario in which we are evaluating four different tools, each with distinct strengths: Tool A for agile methodologies, Tool B for integrations, Tool C for user-friendliness, and Tool D for real-time collaboration. By applying Choice Shuffle Ensembling, the AI is prompted to assess and reorder these tools based on various project needs. The ensemble analysis might reveal that while Tool A is preferred for its agile features, a combination of Tool B's integrations and Tool D's collaboration features could offer a more comprehensive solution tailored to the project's specific requirements for flexibility, connectivity, and team dynamics.

Prompt: "Consider evaluating four project management tools for our next big project: Tool A focuses on agile methodologies, Tool B offers extensive integrations, Tool C is known for its user-friendly interface, and Tool D excels in real-time collaboration features. Shuffle these options and provide an ensemble analysis on which tool might best suit a project requiring agility, extensive third-party integrations, ease of use, and real-time collaboration."

Example 2. Choosing a Risk Mitigation Strategy

- Faced with a potential delay in a critical task within an infrastructure project, the project manager explores four mitigation strategies: adding buffer time, reallocating resources, extending deadlines, and adopting parallel task execution. Through Choice Shuffle Ensembling, each strategy is reevaluated in different sequences and combinations, prompting the AI to analyze their impacts under varying conditions. This process might uncover that while reallocating resources (Strategy 2) is a quick fix, a combination of adding buffer time (Strategy 1) and adopting parallel task execution (Strategy 4) could provide a more robust solution to safeguard the project timeline without compromising overall project integrity.

Prompt: "We have identified a significant risk in our project timeline due to a potential delay in a critical task. Here are four mitigation strategies: Strategy 1 involves adding buffer time, Strategy 2 includes reallocating resources from less critical tasks, Strategy 3 suggests negotiating for extended deadlines with clients, and Strategy 4 recommends adopting a parallel task execution approach. Shuffle these strategies and analyze their potential impacts and suitability for minimizing the delay without compromising project quality."

Example 3. Resolving Resource Allocation Conflicts

- When two critical projects compete for the same resources, the project manager considers four solutions: negotiating compromises, prioritizing tasks, acquiring temporary resources, and delaying non-essential tasks. Utilizing Choice Shuffle Ensembling, these solutions are shuffled and analyzed, enabling the AI to present nuanced strategies that might combine negotiating compromises (Solution A) with acquiring temporary resources (Solution C) to meet immediate needs, followed by a task prioritization review (Solution B) to ensure long-term project alignment and sustainability.

Prompt: "A conflict has arisen due to overlapping resource demands between two high-priority projects. Here are four potential solutions: Solution A proposes negotiating a compromise with project leads, Solution B suggests an analysis to prioritize tasks across projects, Solution C involves seeking additional temporary resources, and Solution D recommends re-evaluating and possibly delaying non-essential tasks. Shuffle these solutions and provide a comprehensive evaluation of each, considering the implications for project timelines, costs, and team morale."

Ex. 4 Practice: Chained Prompting

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Instructions: Practice chaining prompts using an AI agent of your choice. Try chaining input together in one prompt only, as well as using a series of related prompts to progressively elaborate a topic in an ongoing conversation with the AI. Share prompts, outputs, conversations, or just general observations in your room's Miro space.

Practice the prompt techniques we've discussed. Try to come up with original examples which you can relate to your work. Share prompts, outputs, conversations, or just general observations in your room's Miro space.

6. Exploring AI Tools in Project Management

This segment will provide a jumping-off point for project managers on selecting suitable tools, considering how to use AI-assisted features, adjusting them to meet project objectives, and integrating these tools with existing project management systems. By the close of this section, you will be primed to think about how you can create your own AI-enhanced project management environment.

Customizing AI tools for project management is more than just a technical exercise; it's about aligning advanced technology with the human elements of project teams, their workflows, and the unique challenges they face. Let's break down how to tailor AI to enhance project management across various industries and project types.

6.1 Key Considerations for Integrating AI Assistance

Understanding Project Specifics: Begin with a deep dive into your project's DNA—its scale, complexity, nuances, and ultimate goals. This foundational understanding is crucial for molding AI tools to serve your project's specific needs, rather than forcing your project to adapt to rigid, one-size-fits-all AI solutions.

Choosing Flexible AI Tools: Opt for AI platforms that boast adaptability—those with customizable workflows, user interfaces, and integration options. The goal is to find tools that can be molded to fit the contours of your project management landscape, not the other way around.

Integration: The AI tool should blend into your existing project management ecosystem, enhancing tools like Microsoft Project or JIRA, not clashing with them. This integration is key to maintaining a cohesive workflow and ensuring that data moves smoothly across your project management platforms.

Tailoring AI to the Project Lifecycle: AI's role should evolve with your project. In the planning phase, it might focus on optimizing schedules and allocating resources, while execution might see it monitoring progress and flagging risks. This lifecycle-sensitive approach ensures that AI's capabilities are always aligned with your current needs.

Fostering User Adoption: Remember, AI tools are only as effective as the teams that use them. Tailor the tool to fit not just the technical requirements of the project but also the capabilities and comfort levels of your team. Training programs should not only cover the 'how' but also the 'why,' helping your team see AI as a valuable ally.

Upholding Data Integrity: In customizing your AI tool, never lose sight of data privacy and security. Ensure that the tool's data handling aligns with your organization's standards, particularly when sensitive information is involved.

Committing to Continuous Improvement: The customization process doesn't end with deployment. Regularly solicit feedback, monitor tool performance, and stay attuned to new AI advancements that might benefit your project. This iterative approach ensures that your AI tools remain effective and aligned with your evolving project needs.

In essence, customizing AI tools for project management is about creating a symbiotic relationship between technology and the human aspects of project execution. By carefully tailoring AI to fit your project's specific requirements and integrating with existing systems, you can use AI to drive project success.

Ex. 5 Practice: Analyzing and creating content during project initiation

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02_AI-PM-Contoso Pharma Project Apex brief v2.3

Instructions: Above is the link to the starting project brief for project Apex, the Contoso Pharmaceuticals private LLM implementation project. Use an AI agent of your choice to review and analyze the information contained in the brief. Do the following and we'll share our results:

1. Create a project charter based on the information in the brief.
2. Define project vision, goals, and objectives.
3. Try some of the example prompts provided in the Miro board designed for the initiation phase of a project.
4. Come up with some prompts of your own you feel would be valuable for the initial phases of a project.
5. We will share your project charters and examples of the prompts you used.

6.2 Tooling Spotlight: Applying AI Features in ClickUp

ClickUp, renowned for its versatility and productivity-enhancing features, has embraced AI to further empower project managers. The AI capabilities within ClickUp can significantly streamline various aspects of project management, from planning and execution to monitoring and reporting.

Automating Routine Tasks:

- **Action Item Generation:** After meetings, use ClickUp AI to parse notes and automatically generate action items, assigning them to the relevant team members.
- **Project Updates:** Train ClickUp AI to summarize project updates from various communication channels, ensuring stakeholders are promptly and efficiently informed.

Enhancing Decision Making:

- **Predictive Analytics:** Utilize ClickUp AI to forecast project outcomes based on current data trends, enabling proactive adjustments to the project plan.
- **Risk Monitoring:** Set up AI alerts to monitor real-time data for potential risks, allowing for immediate mitigation strategies.

Optimizing Resources:

- **Resource Allocation:** Implement AI-driven resource allocation within ClickUp to match tasks with available team members based on skills, workload, and past performance.
- **Capacity Planning:** Use AI forecasts to anticipate future resource needs, ensuring the project is adequately staffed at all times.

Integrations and Customizations:

- **Tool Integrations:** Leverage ClickUp's extensive integration capabilities to connect with over 1,000 tools, ensuring seamless data flow and communication across platforms.
- **Custom AI Prompts:** Customize AI prompts to suit specific project needs, whether it's generating reports in a particular tone or extracting insights tailored to your project's requirements.

Practical Application:

Imagine a scenario where a project manager is overseeing the rollout of a new software system across multiple departments. The project manager can set up ClickUp to:

- Automatically generate and assign tasks based on meeting notes.
- Provide weekly AI-generated progress summaries to stakeholders, highlighting achievements, risks, and next steps.
- Use AI to estimate the project's remaining cost and timeline, adjusting resource allocation as needed.
- Integrate ClickUp with existing tools like Slack for communication, GitHub for code management, and Trello for task tracking, ensuring all project data is centralized and accessible.

By integrating AI into ClickUp, project managers can not only enhance their efficiency but also gain deeper insights into their projects, allowing them to make informed decisions and keep stakeholders engaged and informed.

For project managers new to AI, starting with ClickUp's AI features can be a practical first step. Begin by exploring one AI capability at a time, such as automating task assignments or generating project summaries. As you become more comfortable with these features, gradually expand your use of AI to cover more complex aspects like predictive analytics and resource optimization.

6.3 Tool Spotlight: AI Assistance in Primavera and Microsoft Project

AI-Driven Scheduling in Primavera and Microsoft Project

- **Resource Optimization:** AI algorithms analyze resource availability, skill sets, and workload to allocate tasks efficiently, ensuring that resources are utilized optimally without overburdening team members.
- **Predictive Delay Identification:** By examining historical project data and current progress, AI can identify patterns and predict potential delays, allowing project managers to proactively address issues before they impact the schedule.
- **Dynamic Adjustment Recommendations:** AI provides actionable recommendations for schedule adjustments, such as reassigning tasks or extending deadlines, to mitigate risks and keep the project on track.

Practical Application in Microsoft Project and Primavera

- **Microsoft Project:** Leverage AI features to automatically generate project plans based on objectives and constraints. Use AI-driven analytics to monitor project health and adjust schedules in real time based on performance data and risk analysis.
- **Primavera:** Utilize AI for complex project scenarios, especially in construction and engineering, to forecast project outcomes, optimize

resource allocation, and adjust schedules based on environmental factors and project interdependencies.

Implementing AI-Driven Scheduling

- **Data Integration:** Ensure comprehensive project data is integrated into the project management tool, including task durations, dependencies, resource availability, and historical project performance.
- **Customization:** Tailor AI settings to align with project-specific requirements, such as defining critical paths, setting priority tasks, and customizing resource allocation rules.
- **Continuous Monitoring:** Use AI-driven dashboards to continuously monitor project progress, Resource utilization, and risk factors, enabling timely interventions.
- **Stakeholder Communication:** Automate stakeholder updates with AI-generated reports that highlight schedule changes, potential delays, and corrective actions taken.

Example:

Consider a large-scale infrastructure project with multiple dependencies and a diverse team. The project manager uses Microsoft Project, enhanced with AI, to input initial project parameters and constraints. The AI tool analyzes historical data from similar projects and current resource availability to generate an optimized project schedule. As the project progresses, the AI tool continuously monitors task completion rates, resource utilization, and external factors, adjusting the schedule dynamically to address emerging risks and delays. The project manager receives AI-generated insights and recommendations, facilitating informed decision-making and ensuring the project remains on track.

By integrating AI-driven scheduling and planning into their practice, experienced project managers can navigate the complexities of large-scale projects more effectively, ensuring that project objectives are met within the desired timelines and resource constraints.

Microsoft Project AI for Risk Management:

Data Integration: Begin by ensuring all project-related data, including schedules, resources, budgets, and past performance metrics, are integrated into Microsoft Project.

- **Setting Up AI Risk Analysis:** Navigate to the AI or analytics feature within Microsoft Project. Configure the AI model to analyze specific project metrics such as task completion rates, budget variance, and resource utilization against historical project data. You will need to have both project

plan data and actuals populated in order to use risk analysis features of CoPilot.

- **Risk Identification:** Use the AI tool to sift through project data, identifying patterns or anomalies that signal potential risks.
- For example, if the AI detects a recurring pattern of delays in a particular project phase, it can flag this as a potential risk for future projects.
- **Risk Prioritization:** The AI tool can assign risk scores based on the potential impact and likelihood of identified risks, helping project managers prioritize which risks to address first.

Mitigation Recommendations:

Based on the identified risks, the AI can suggest mitigation strategies, drawing from a database of best practices and historical outcomes.

- **Implementing Mitigation Strategies:** Select the most suitable mitigation strategies suggested by the AI and incorporate them into the project plan.
- **Monitoring and Adjustment:** Continuously monitor the effectiveness of implemented strategies using AI, adjusting as necessary based on real-time data and AI insights.

6.4 Tool Spotlight: Proactive Risk Management

Again, we will spotlight ClickUp as a leader in providing the type of onboard AI features that project managers need in their tools.

- **Integration with Project Data:** Ensure that ClickUp is fully integrated with all project-related data sources, including task lists, communication channels, and external data feeds.
- **Enabling AI Features:** Activate ClickUp's AI features, focusing on risk management tools within the platform. Customize the AI settings to focus on key risk indicators relevant to your project.
- **Automated Risk Scanning:** Set the AI to continuously scan project activities and communications for indicators of potential risks, such as missed deadlines, budget overruns, or communication breakdowns.
- **Real-Time Alerts:** Configure ClickUp to send real-time alerts when the AI identifies potential risks, ensuring immediate attention.
- **Collaborative Risk Resolution:** Use ClickUp's collaboration features to engage the project team in developing and implementing risk mitigation strategies based on AI recommendations.
- **Risk Tracking and Reporting:** Utilize ClickUp's reporting features to track the status of identified risks and the effectiveness of mitigation efforts, with AI providing ongoing analysis and updates.

By following these steps within tools like Microsoft Project and ClickUp, project managers can leverage AI not only to identify and prioritize risks proactively but also to devise and implement effective mitigation strategies, ensuring that projects remain on track despite potential setbacks.

6.5 Tool Spotlight: Publicly Available Generative AI Tools

For project managers not using AI-integrated project management tools like Microsoft Project or ClickUp, leveraging ChatGPT Data Analyst alongside manual spreadsheets or text datasets, and integrating Google's productivity applications with Sheets and Bard/Gemini, can offer a practical alternative for proactive risk management. Here's how:

Using ChatGPT Data Analyst with Spreadsheets:

- **Data Preparation:** Compile project data into a structured format within a spreadsheet, including task timelines, budget allocations, resource assignments, and progress updates.
- **Risk Indicators Identification:** Define key risk indicators (KRIs) relevant to your project, such as task delays, budget variances, or resource bottlenecks.
- **ChatGPT Data Analyst Integration:** Utilize ChatGPT Data Analyst to analyze the spreadsheet data. This might involve exporting data from the spreadsheet and feeding it into ChatGPT Data Analyst with specific queries related to KRIs.
- **Risk Analysis:** Input queries into ChatGPT Data Analyst to identify patterns or anomalies in the data that may indicate potential risks. For instance, "Identify any tasks with recurring delays over the past three months."
- **Generating Insights:** Based on ChatGPT Data Analyst's output, extract actionable insights related to potential risks and document them for further analysis.
- **Mitigation Strategy Formulation:** Based on identified risks, use ChatGPT Data Analyst to brainstorm potential mitigation strategies. Input queries like, "Suggest mitigation strategies for tasks with recurring delays."
- **Implementation and Monitoring:** Apply chosen mitigation strategies within the project and continue to monitor project data through the spreadsheet, using ChatGPT Data Analyst periodically to reassess risk levels and the effectiveness of implemented strategies.

Integrating Google Sheets with Bard/Gemini:

- **Sheet Setup for Risk Tracking:** Organize your project data in Google Sheets, setting up a dedicated risk management tab to track KRIs and associated data.

- **Bard/Gemini Integration:** Use Bard or Gemini to analyze data directly from Google Sheets. Set up Google Sheets to connect with Bard/Gemini APIs, allowing for real-time data analysis.
- **Automated Risk Analysis:** Configure Bard/Gemini to automatically analyze project data in Sheets, identifying potential risks based on predefined KRIs.
- **Insight Extraction:** Use Bard/Gemini to generate insights and recommendations for risk mitigation, which can be directly populated into Google Sheets for review.
- **Collaborative Risk Management:** Leverage Google Sheets' collaborative features to share risk insights with the project team, facilitating collective decision-making on mitigation strategies.
- **Ongoing Risk Monitoring:** Continuously update the risk management tab in Google Sheets with new project data, using Bard/Gemini to provide updated risk analyses and recommendations.

By adapting these methodologies, project managers can effectively manage risks using available AI tools and productivity applications, ensuring a proactive approach to risk management regardless of the specific project management software in use.

6.6 Scenario: AI-Assisted Resource Allocation:

AI algorithms analyze various factors, including team members' skills, experience, workload, and even past performance, to optimize task assignments. This ensures that the right tasks are matched with the right team members, leading to more efficient project execution.

- **Data Collection:** Gather comprehensive data on team members, including their skill sets, preferences, current workload, and historical performance on similar tasks.
- **Integration with Project Management Tools:** Ensure your project management tool can integrate with AI capabilities, whether natively or through third-party AI applications. Tools like ClickUp or Trello often have plugins or integrations for AI functionalities.
- **AI Configuration:** Configure the AI tool to understand the parameters for resource allocation within your project. This might involve setting up rules or weights for different factors, such as prioritizing skill match over availability or vice versa.
- **Task Analysis and Assignment:** Input upcoming tasks into the system, detailing their requirements, deadlines, and any specific skills needed. Let the AI algorithm analyze the tasks against the team data and propose optimal matches for each task.
- **Review and Adjustment:** Review the AI-recommended task assignments for feasibility and team balance. Make adjustments as needed, considering team feedback and other dynamic project factors.

- **Monitoring and Feedback Loop:** Monitor the effectiveness of AI-driven resource allocation, collecting feedback from the team on their task assignments and workload. Use this feedback to refine the AI model, ensuring it continuously learns and improves its recommendations over time.

Example Scenario:

Imagine managing a software development project with multiple parallel tasks, including development, testing, and documentation. By inputting detailed task requirements and team data into your AI-enhanced project management tool, the AI algorithm proposes task assignments that consider developers' coding expertise, testers' familiarity with the software, and writers' technical knowledge.

As the project progresses, the AI tool adjusts assignments based on real-time workload assessments and task completion rates, ensuring no team member is overburdened and tasks are progressing efficiently. Regular feedback sessions with the team provide data to further refine the AI's understanding of team capabilities and preferences, continually improving the resource allocation process.

By implementing AI-driven resource allocation, project managers can ensure a more balanced workload distribution, higher team satisfaction, and increased productivity, ultimately leading to the successful and timely completion of projects.

6.7 Scenario: NLP in Stakeholder Communication:

NLP technologies enable the analysis and generation of human-like text, allowing project management tools to automate communications, draft reports, and provide updates tailored to the preferences and needs of different stakeholders.

- **Stakeholder Analysis:** Begin by mapping out your stakeholders and categorizing them based on their interest, influence, and communication preferences. This could include team members, executives, clients, and external partners.
- **Communication Planning:** Develop a communication plan that outlines the frequency, format, and content of updates for each stakeholder group. NLP can automate much of this by personalizing messages based on stakeholder profiles.
- **Tool Configuration:** Configure your project management tool to integrate NLP capabilities. This might involve setting up templates for updates, reports, and alerts that NLP can automatically populate with project data.
- **Automated Drafting:** Utilize NLP to draft communication materials, from detailed reports for executives to concise updates for the broader team. NLP can summarize project status, highlight key milestones, and flag potential issues, all in a tone and format suited to each stakeholder group.

- **Feedback and Iteration:** Collect feedback on the effectiveness of AI-generated communications and continuously refine the NLP settings to better align with stakeholder needs and preferences.

Practical Application: Imagine a scenario where a project manager oversees a multi-departmental initiative with diverse stakeholders. The project management tool, enhanced with NLP, is configured to send weekly updates. For the technical team, the update focuses on technical challenges and solutions, using technical jargon and data. For business stakeholders, the communication emphasizes project impact on business goals, ROI, and timelines, presented in a business-oriented language.

Further, NLP automates the generation of a monthly project newsletter, highlighting achievements, upcoming milestones, and spotlights on team members' contributions, fostering a sense of community and transparency among all stakeholders.

By integrating NLP into project management tools for stakeholder communication, project managers can ensure that all parties are kept informed in a manner that resonates with their specific interests and roles, enhancing engagement and support for the project across the board.

6.8 Scenario: Using AI for Predictive Analytics in Project Management

Predictive analytics uses historical data, machine learning, and AI algorithms to forecast future project outcomes. It helps project managers anticipate potential delays, cost overruns, and resource constraints before they become critical issues.

Steps for Implementing Predictive Analytics:

1. **Data Aggregation:** Compile comprehensive project data, including historical performance metrics, current progress reports, resource allocation, and external factors like market trends or regulatory changes.
2. **Tool Selection:** Choose AI tools or platforms that specialize in predictive analytics and can integrate with your existing project management software. Tools like IBM Watson, Google Cloud AI, or custom solutions developed using platforms like TensorFlow can provide the necessary predictive capabilities.
3. **Model Training:** Train the AI model using your project data. This involves defining the parameters the model should consider (e.g., task duration, team productivity rates) and feeding it historical project data to learn patterns and correlations.
4. **Forecasting:** Use the trained AI model to forecast future project states. For example, input current project data into the model to predict the impact of

adding new tasks on the project timeline or how changes in resource allocation might affect the budget.

5. **Scenario Analysis:** Conduct scenario analyses to understand the potential outcomes of different project decisions. This could involve comparing the forecasts generated by the AI model under various conditions, such as changes in project scope, deadlines, or resources.
6. **Decision Making:** Use insights gained from predictive analytics to inform project decisions. This could mean adjusting timelines, reallocating resources, or revising strategies to mitigate predicted risks.
7. **Continuous Learning:** As the project progresses, continuously feed new data into the AI model to refine its predictions, ensuring they become more accurate and reliable over time.

Practical Application:

Consider a project manager leading a software development project with a tight deadline. By leveraging predictive analytics, the project manager can input current project data into the AI model to forecast the likelihood of meeting the deadline based on current progress rates, team capacity, and known risks. If the model predicts a high risk of delay, the project manager can explore scenarios like increasing team size, reprioritizing features, or extending deadlines to find the most effective solution.

Seamless Integration and Customization" in AI-enhanced project management tools, it's crucial to focus on how these tools can be adapted and connected to the broader enterprise ecosystem, ensuring a cohesive and efficient project management experience.

6.9 Integration Considerations

1. **Assessment of Enterprise Systems:** Start by cataloging the existing systems and tools used across the organization that could be relevant to project management, such as ERP systems, CRM platforms, communication tools, and data analytics suites.
2. **Identification of Integration Points:** Determine where and how AI-enhanced project management tools can connect with these systems. Look for common data points, shared processes, or areas where data from one system can enrich or automate processes in another.
3. **API Utilization for Connectivity:** Leverage Application Programming Interfaces (APIs) offered by both the AI-enhanced project management tools and the existing enterprise systems to create connections. APIs are key to enabling different software systems to communicate and exchange data seamlessly.
4. **Customization for Specific Needs:** Utilize the customization options within AI-enhanced tools to tailor the integration to your specific project and organizational requirements. This might involve configuring data

dashboards, setting up custom alerts, or creating automated workflows that reflect your unique project processes.

5. **Testing and Validation:** Before rolling out the integration widely, conduct thorough testing to ensure that data flows correctly between systems, processes are automated as intended, and no system conflicts arise.
6. **Training and Change Management:** Prepare your project team and relevant stakeholders for the new integrated system. Offer training sessions to ensure everyone is comfortable with the new workflows and understands the benefits of the integration.
7. **Ongoing Monitoring and Adjustment:** After implementation, continuously monitor the integrated ecosystem for any issues or inefficiencies. Be prepared to make adjustments as needed, and consider feedback from users to refine the system further.

Example Scenario:

Imagine a large construction firm implementing an AI-enhanced project management tool. The tool needs to integrate with the firm's ERP system for financial data, a CRM platform for client communication, and specialized construction design software.

By using APIs, the project management tool can pull financial data from the ERP to inform budget forecasts and resource allocation, update client records in the CRM with project progress reports generated by AI, and import design changes from the construction software to adjust schedules and tasks dynamically.

Custom workflows are set up to automate the distribution of AI-generated risk assessments to project stakeholders, trigger procurement processes in the ERP based on project schedules, and update client project dashboards in the CRM in real-time.

This seamless integration ensures that all aspects of the project are aligned, data is consistent across systems, and stakeholders have access to the latest information, enhancing decision-making and project efficiency.

As project managers explore the potential of AI to augment their toolsets, it's essential to view AI not merely as a technological upgrade but as a strategic ally that amplifies their expertise in steering large-scale projects to success.

6.10 PMI's curated list of tools for project management assistance:

Aspect of Project Management	Tool Name	Key Functionalities
Planning	**Show Me Diagrams** (Plugin)	Generates Gantt charts, network diagrams, project timelines, dependencies, and progress visuals.
Prototyping	**Autodesk Fusion 360**	Enables 3D designs, streamlines product development, and supports various modeling techniques.
	Catia	Offers 3D modeling and simulation, generative shape design, and product interaction.
	Ansys Discovery	Provides interactive software models and a simulation-driven design tool.
Time and Cost Management	**Smartsheet**	Delivers explanations, business insights, and advanced formulas for work process streamlining.
Control Management	**WebPilot** (Plugin)	Analyzes, collates information, and generates accurate project-related data.
Risk Management	**ChatGPT AI Assistant for Jira**	Facilitates intelligent issue tracking, predictive analysis, task automation, risk identification, and resource management.
Workflow Management and Automation	**ClickUp AI**	Generates dependency reports, tracks progress, identifies risks, and predicts project data.
Image, Text, Code Generation	**Midjourney**	Creates images and videos for construction, tracks progress, and controls performance.
	Azure AI	Builds intelligent applications like chatbots, content generators, and offers design solutions.

	Autodesk Revit	Generates design solutions based on user-defined constraints and objectives.
	GitHub Copilot	Writes code and suggests efficient code blocks.
Writing Assistant	**Microsoft 365 Copilot**	Assists with spelling, grammar, generates texts in various styles, and codes in multiple languages.
Reading Assistant	**Access PDFs and Docs** (Plugin)	Retrieves and organizes essential documents, extracts relevant data, and analyzes content.
	LinkReader (Plugin)	Extracts and organizes project-related information and data, analyzes linked content.
Creative Writing	**Google Bard**	Generates text, translates languages, writes creative content, and answers questions informatively.
	ChatGPT by OpenAI	Produces human-like text, translates languages, creates creative content, and answers questions informatively.

6.11 Other great AI tools Project Managers should play with

- **Atlassian Suite:** Extracting decisions and summarizing everything that occurred, able to translate reporting to actions, etc.
- **Dailybot:** For workflow management.
- **dFakto:** Powerful data management for aggregated decision making.
- **Eleven Labs:** Voice generation, scripts, voiceover.
- **FlexClip:** AI Video Generation.
- **Gamma.app:** Produces presentations and visuals based on your simple written inputs.
- **GitHub copilot:** Code generation and analysis.
- **Humata:** Make queries about documents and files.
- **Loop:** Collaboration and connection between teams and content.
- **Microsoft Suite:** CoPilot, onboard AI across Microsoft tool suites.
- **Miro:** Miro assist: Image generation, grammar and content cleanup, Cluster by keywords or sentiment after brainstorming, for instance.

- **Motion:** Coordinate work: Manage tasks, assignments, and priorities.
- **Offolio:** AI project planning, scheduling, WBS automation, dashboards, Gantt charts, kanban, critical path, and more.
- **Perplexity:** Great for reliable sources.
- **Pica AI:** Face swap.
- **Project Operations and Dynamics365:** Onboard CoPilot specifically for assistance with Project work.
- **ScopeMaster:** AI requirements analysis tool. Refines backlog, automates functional sizing, manages dependencies, analyzes user stories and WBS/task decomposition, etc.
- **Spinach.io:** Meeting summary and transcription, with plan and action items output. (Integrates with Jira, Trello, Asana, etc.)
- **Stepsize** (still in beta): Reads tools like Slack, Jira, GitHub, gives summaries and visualizes project status and metrics.
- **Tomi:** Marketing, audience analysis, predictive lead scoring.

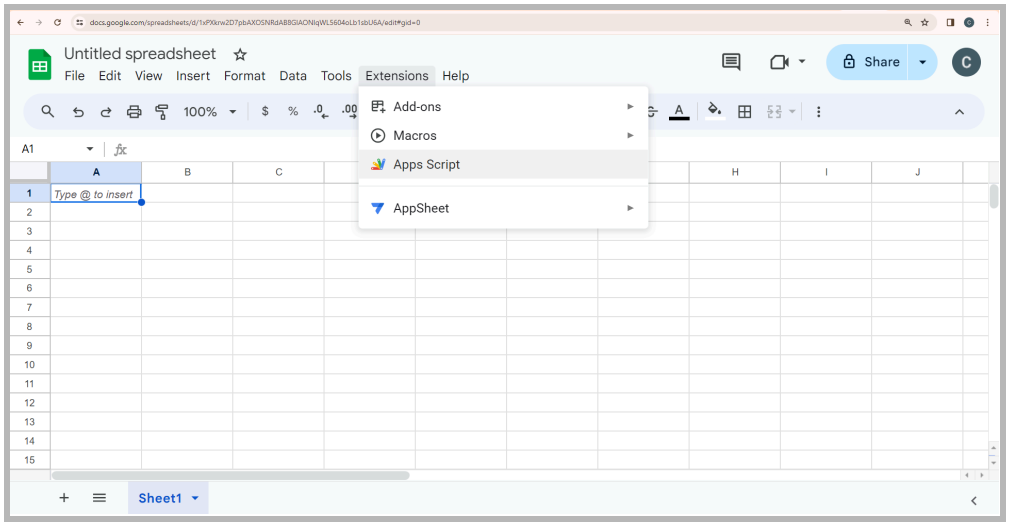
Ex 6 Practice: Gemini + Sheets Integration

6.1 We will level up our prompt chaining by integrating Google Gemini with Google sheets.

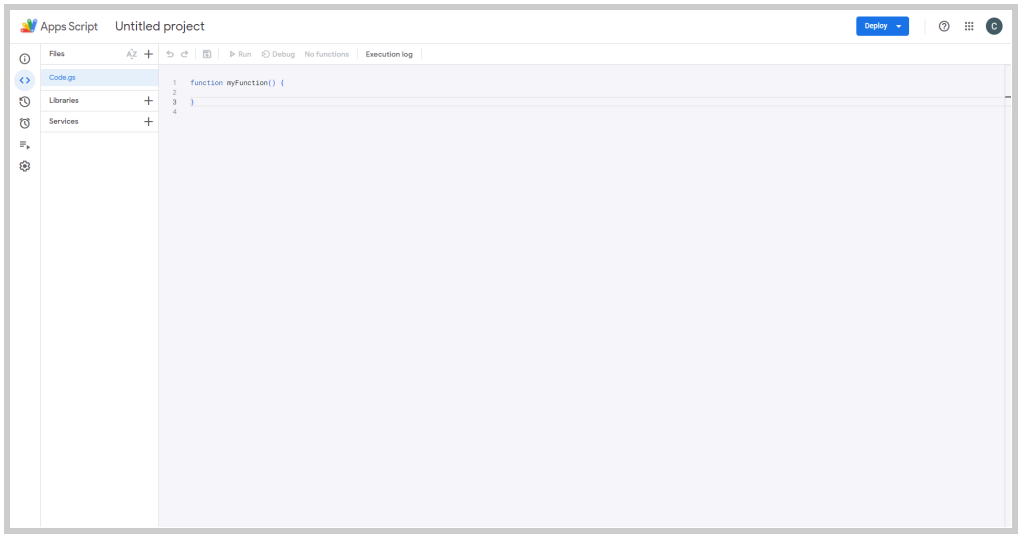
This allows us to set up relationships between prompts that retain the same logic, but create dynamic output because our initial input is variable.

Let's check this out.

First, make sure you are logged into your Google account and open a new Sheet. Go to "Extensions" and select "Apps Script."



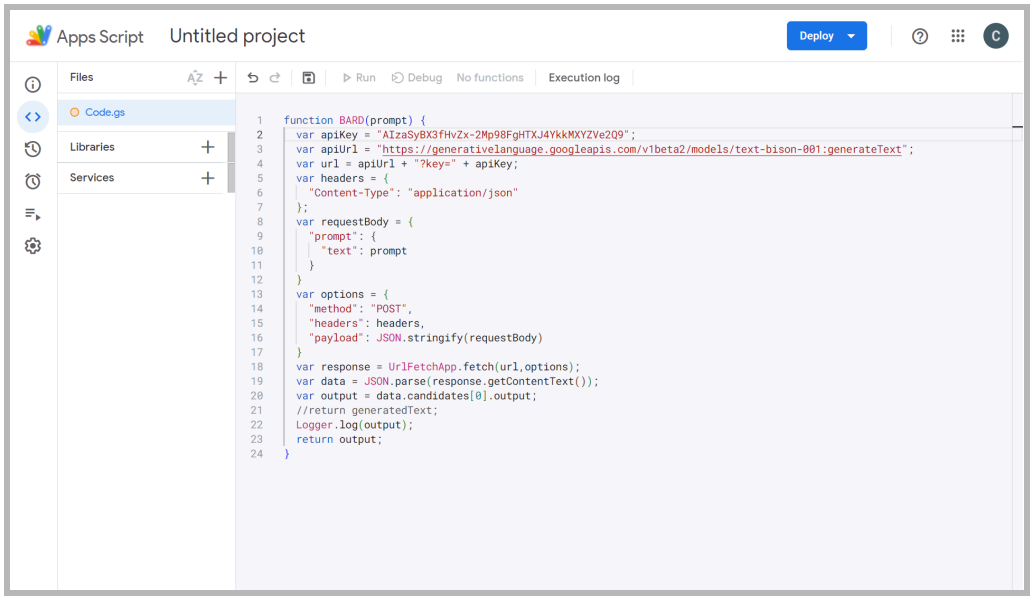
In the Apps Script area, you paste in the Bard Call script provided in your course material. Next, you will use the Gemini AI Studio to create an API key you can use for the call.



Here is the script:

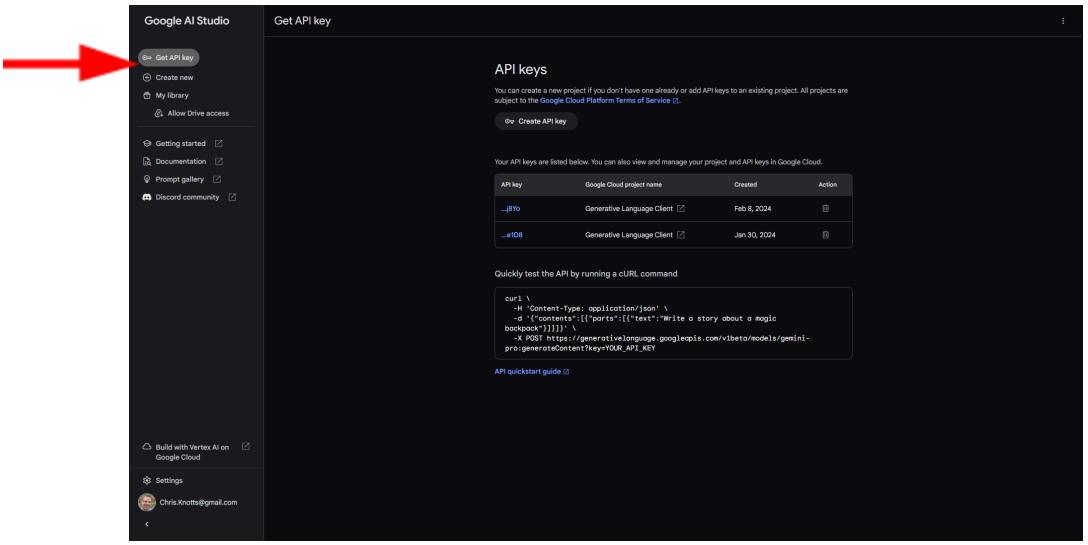
```
function BARD(prompt) {
  var apiKey = "AIzaSyAdaGAhuv-1Lp06GyUTYN1CkkNWLPUe1D8";
  var apiUrl =
"https://generativelanguage.googleapis.com/v1beta2/models/text-bis
on-001:generateText";
  var url = apiUrl + "?key=" + apiKey;
  var headers = {
    "Content-Type": "application/json"
  };
  var requestBody = {
    "prompt": {
      "text": prompt
    }
  }
  var options = {
    "method": "POST",
    "headers": headers,
    "payload": JSON.stringify(requestBody)
  }
  var response = UrlFetchApp.fetch(url,options);
  var data = JSON.parse(response.getContentText());
  var output = data.candidates[0].output;
  //return generatedText;
  Logger.log(output);
  return output;
}
```

After you've pasted in the script, the Apps Script page should look like this:

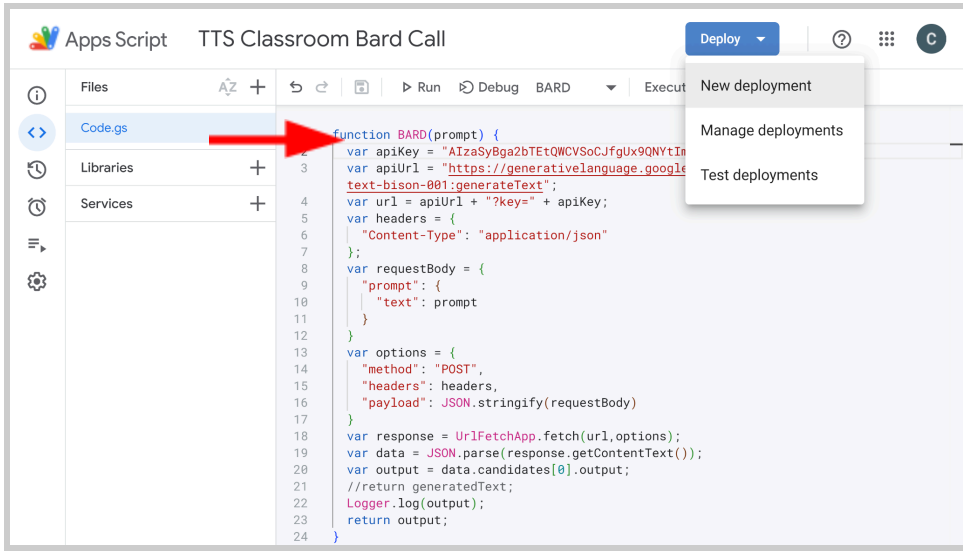


Next, head over to https://aistudio.google.com/app/apikey

And select “get API key.” You’ll be able to copy the key to your clipboard.

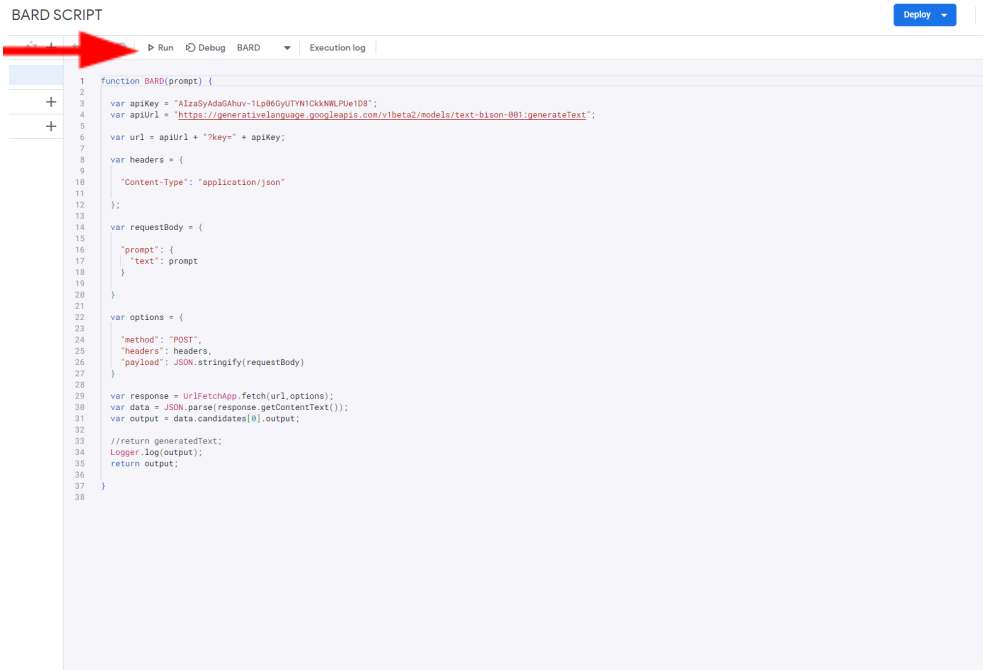


Paste the key value here, to replace the “dummy” placeholder API value.



Run the script. You will be asked to review your permissions. From the “Choose an account” screen, select the account to associate with the script, and proceed through the following screens allowing access to the Apps Script project.

Once finished, your Gemini/Bard call script should be functioning in your Sheet.



7. Scenario Exploration: Implementing an Internal LLM at Contoso Pharmaceuticals

Embarking on the journey to implement an internal Large Language Model (LLM) within an enterprise is a complex yet transformative endeavor. This venture touches upon various facets, from the technical bedrock that will support the LLM to the human elements that will bring it to life and ensure its alignment with the organization's vision.

Technical Foundations

At the core of an LLM's implementation are the technical prerequisites that need to be meticulously planned:

- **Infrastructure Needs:** The backbone of an LLM lies in robust server capabilities and expansive storage solutions to handle the immense computational demands. It's crucial to opt for infrastructure that not only meets current needs but is also scalable to adapt to future expansions.
- **Software and Frameworks:** Selecting the right AI model frameworks is essential. These should offer the flexibility and support needed for training and deploying LLMs, ensuring compatibility with your enterprise's tech stack.

Assembling the Team

The implementation of an LLM requires a multidisciplinary team, each bringing a unique skill set to the table:

- **Data Scientists:** Tasked with the intricate process of model training, ensuring the LLM can generate accurate and contextually relevant responses.
- **IT Specialists:** The tech wizards who will set up the necessary infrastructure, ensuring the system's stability and scalability.
- **Project Managers:** The orchestrators of this symphony, ensuring every piece moves in harmony, keeping the project aligned with its goals, on time, and within budget.

Project Manager's Role

The project manager stands at the helm of this venture, navigating through the complexities of integrating an LLM into the enterprise. Their role encompasses:

- **Strategic Alignment:** Ensuring the LLM's implementation is in lockstep with the broader organizational objectives.

- **Communication Hub:** Facilitating seamless interaction between technical experts and business stakeholders, translating complex AI concepts into actionable business strategies.

Navigating the Implementation

The roadmap to integrating an LLM involves several critical steps, each ensuring the system is not only technically sound but also strategically aligned and user-friendly:

- **Data Preparation:** Gathering and refining project management-related data to serve as the training bed for the LLM.
- **Infrastructure Setup:** Establishing a robust computing environment, deciding between cloud-based and on-premise solutions based on the organization's needs and policies.
- **Model Customization:** Tailoring the LLM to fit the unique requirements of the project environment, possibly enhancing it with project-specific data.
- **Integration:** Ensuring the LLM works hand-in-hand with existing project management tools, enhancing rather than disrupting existing workflows.
- **Security Measures:** Implementing stringent security protocols to protect sensitive project data, in compliance with regulatory standards.
- **Pilot and Validation:** Conducting controlled tests to validate the LLM's performance, ensuring its outputs are practical and reliable.
- **Training for Adoption:** Equipping the project team with the knowledge to effectively interact with the LLM, integrating its insights into their decision-making processes.
- **Continuous Oversight:** Regularly monitoring the LLM's performance, ready to recalibrate or update the system as project dynamics evolve.

7.1 Elaborating the Scenario

1.. Infrastructure Foundations

- Hardware Considerations: Assess the computational horsepower required, focusing on GPUs/CPUs, memory, and storage, to ensure the LLM operates smoothly.
- Deployment Environment: Choose between the scalability of cloud services and the data sovereignty offered by on-premises solutions, tailoring this choice to your project's scale and sensitivity.

2. Data Strategy

- Sourcing Data: Pinpoint both internal and external data repositories that will feed into the LLM, ensuring relevance to your project management objectives.
- Data Prep: Establish protocols for cleaning and structuring this data, rendering it fit for efficient LLM training.

3. Model Development

- Customization: Adapt the LLM to address specific project management challenges, embedding industry-specific knowledge and jargon for higher relevance.
- Evolving Intelligence: Set up a framework for the LLM to continuously evolve, learning from new data and interactions to enhance its utility over time.

4. Security and Regulatory Compliance

- Privacy Measures: Align LLM implementation with stringent data protection laws and internal privacy policies to safeguard sensitive information.
- Access Governance: Craft strict access controls to define clear boundaries on who can interact with the LLM and under what conditions.

5. System Integration

- Seamless Connectivity: Ensure the LLM can integrate effortlessly with existing project management platforms through well-defined APIs or integration protocols.
- Compatibility Assurance: Verify that the LLM's outputs are compatible with and can enhance the functionality of your current project management ecosystem.

6. User Interaction

- Intuitive Interfaces: Design interfaces that are accessible to project managers without necessitating deep technical knowledge.
- Iterative Feedback: Embed mechanisms to capture user feedback, facilitating continuous refinement of the LLM's performance and usability.

7. Monitoring and Upkeep

- Performance Tracking: Deploy tools to monitor key performance indicators of the LLM, such as accuracy, responsiveness, and user satisfaction.

- Continuous Optimization: Commit to regular updates and retraining of the LLM to incorporate fresh data, user insights, and advancements in AI technology.

8. Governance Framework

- Ethical Use: Forge ethical guidelines to govern LLM usage, ensuring transparency, fairness, and accountability in its applications.
- Structured Oversight: Establish a comprehensive governance structure outlining roles, responsibilities, and protocols for the LLM's lifecycle management.

9. Financial Planning

- Budget Allocation: Forecast and earmark funds for both the initial setup and ongoing operational expenses of the LLM, including infrastructure costs, licenses, and personnel.
- ROI Analysis: Undertake a thorough cost-benefit evaluation to validate the LLM investment against the anticipated efficiencies and enhancements in project management processes.

10. Engaging Stakeholders

- Transparent Communication: Maintain open lines of communication with all stakeholders, elucidating the LLM's progress, potential impacts, and benefits.
- Empowerment through Training: Roll out comprehensive training and support initiatives to ensure project managers and users can leverage the LLM to its fullest potential.

By concentrating on these pivotal areas, you're not just integrating a technological tool but are redefining how project management is conducted within your enterprise. This strategic blueprint will not only ensure the LLM's integration enhances project management efficiency but also that it aligns with and propels your organization's broader objectives forward.

7.2 Further Reading:

1. Simplifying Access to Large Language Models with the NVIDIA NeMo Framework and Services: This blog post discusses how the NVIDIA NeMo framework simplifies access to large language models and their deployment at scale. It also mentions the use of prompt learning capabilities for customizing foundation models.
2. New NVIDIA NeMo Framework Features and NVIDIA H200 Supercharge LLM Training Performance and Versatility: This blog post highlights the new features of

the NVIDIA NeMo framework and how they enhance the training performance and versatility of LLMs.

3. Deploying a 1.3B GPT-3 Model with NVIDIA NeMo Framework: This blog post provides a practical example of deploying a 1.3 billion parameter GPT-3 model using the NVIDIA NeMo framework.
4. Model Overview - NVIDIA Docs: This documentation provides an overview of the models supported by the NVIDIA NeMo framework, including techniques for efficient large-scale language model training on GPU clusters.
5. GitHub - NVIDIA/NeMo: NeMo: a toolkit for conversational AI: The NVIDIA NeMo GitHub repository provides a wealth of resources for implementing conversational AI models, including LLMs, using the NVIDIA NeMo framework.
6. NVIDIA NeMo SteerLM Customizes a Model's Responses During Inference: This blog post discusses how SteerLM, integrated into NVIDIA NeMo, can be used to customize a model's responses during inference.

Ex. 7 Practice: Stakeholder Sentiment Analysis

miro.com/app/board/uXjVNvgYjwY=/?share_link_id=797673177801

Stakeholder Survey Response Data:
https://drive.google.com/file/d/1HPRR0fjMwRJTXltbHR3KbBTH0XDz7uhQ/view?usp=sharing

Instructions: This CSV document contains all the survey response data collected from an initial stakeholder questionnaire about the training data preparation phase of Project Apex. We will work with our AI assistant to perform sentiment analysis on this data, and help us organize the results into key themes, identification of risks, potential action items, and opportunities for improvement.

1. Upload the CSV document with the survey response data into your AI agent.
2. Use the system message and the detailed prompt provided in the Miro board to perform sentiment analysis on the data. Ask the AI to generate:
    - Overview of Sentiment Distribution
    - Sentiment by Stakeholder Group
    - Key Themes and Concerns
    - Representative comments for each theme
3. Feel free to play with your own versions
6. We will share your results after the exercise. If you like, you can check out an example of a finished product, but don't look at this until you have completed the exercise yourself!

03_Project Apex_ Data Assessment Stakeholder Sentiment Analysis.p...

8. Applying assistive GenAI in daily PM work

Incorporating Generative AI (GenAI) into project management, particularly for content generation and management, represents a strategic shift towards more efficient and dynamic project environments. For seasoned project managers at the helm of large-scale projects, this integration can significantly enhance productivity and decision-making. Here's a practical guide to leveraging GenAI in these domains:

8.1 Content Generation with GenAI

- **Automated Documentation:** Deploy GenAI to streamline the creation of key project documents. By inputting project parameters and ongoing updates, GenAI can produce well-structured project plans, requirements specifications, and progress reports, ensuring they meet industry standards while saving considerable time.
- **Meeting Summaries:** Utilize GenAI to transcribe and summarize key points and action items from meetings. This guarantees that all team members, regardless of their attendance, stay informed and clear on their responsibilities.
- **Risk Management Reports:** Leverage GenAI's analytical prowess to sift through project data, pinpoint potential risks, and automatically generate in-depth risk management reports. These can cover risk evaluations, mitigation tactics, and backup plans, fostering a proactive stance towards project risks.
- **Version Control and Audit Trails:** Enhance document integrity and accountability in your project management systems with GenAI-powered version control and audit trails. This ensures every document alteration is logged and traceable to specific team members.
- **Intelligent Content Organization:** GenAI can revolutionize how project-related content is organized and accessed. By understanding the context and content, GenAI can tag, sort, and recommend documents, drastically cutting down the time spent on information retrieval.
- **Access and Permissions Management:** With GenAI, fine-tune access controls for project documents, ensuring sensitive data remains secure and is only accessible to authorized individuals. This is especially crucial for projects handling confidential or regulated information.

8.2 Communication assistance and automation

- **Real-Time Collaboration:** Foster a collaborative spirit by allowing team members to work concurrently on documents with GenAI assistance, which can offer real-time suggestions and relevant data.
- **Language Translation:** For projects with global teams, GenAI's instant translation capabilities can bridge language gaps, ensuring seamless communication and collaboration across diverse team members.

- **Feedback Loops:** GenAI can analyze document feedback, proposing enhancements to foster a continuous improvement ethos within the project team.

Navigating Potential Challenges

While GenAI promises numerous advantages in content generation and management, it's vital to proactively tackle possible hurdles:

- **Data Privacy and Security:** Prioritize compliance with data protection laws and organizational policies to safeguard project data.
- **Content Accuracy:** Regularly assess and refine the GenAI system to ensure the continued relevance and precision of the content it generates.
- **Adoption and Change Management:** Develop comprehensive change management strategies to smooth the transition for project teams to GenAI tools, emphasizing training and support.

Integrating GenAI into content-related aspects of project management not only streamlines administrative duties but also increases efficiency across the entire project management lifecycle.

8.3 Using onboard or external AI in conjunction with your PMIS

Integrating AI, whether onboard or external, with your Project Management Information System (PMIS) can significantly transform how large-scale projects are managed, offering a blend of enhanced efficiency, precision in planning, and a proactive approach to potential challenges. Here's a breakdown of how this integration can revolutionize various aspects of project management:

Enhancing Project Planning and Scheduling

- **AI-Driven Forecasting:** Leverage GenAI to dissect historical project data, enabling you to craft more accurate forecasts for timelines, resource needs, and identify potential bottlenecks, leading to robust and realistic project schedules.
- **Resource Optimization:** Utilize AI algorithms to refine resource allocation, considering variables such as skill sets, availability, and workload, ensuring optimal productivity and reduced costs.

Improving Communication and Collaboration

- **Automated Updates and Alerts:** Set up AI to autonomously generate and disseminate updates and alerts related to project progress and key milestones, keeping all stakeholders in the loop and ensuring timely communication.

- **Meeting Facilitation:** Deploy AI to manage meeting schedules, prepare agendas aligned with project priorities, and compile minutes, streamlining team interactions and enhancing focus.

Streamlining Document Management

- **Intelligent Document Organization:** Apply AI to systematically categorize, tag, and organize project documents, simplifying the process for team members to locate and access pertinent information swiftly.
- **Smart Search Capabilities:** Enhance your PMIS with AI-powered search features that support natural language queries, yielding more precise and contextually relevant search results.

Risk Management and Mitigation

- **Predictive Analytics:** Utilize AI for early identification of potential project risks by analyzing a mix of project data, external factors, and historical patterns, allowing for timely risk mitigation strategies.
- **Automated Risk Monitoring:** Configure AI tools to continuously scrutinize project parameters for emerging risks, providing real-time alerts and enabling prompt action.

Quality Control and Assurance

- **AI-Assisted Code Reviews:** For software development projects, integrate AI tools capable of conducting automated code reviews to spot issues and recommend enhancements.
- **Quality Metrics Analysis:** Employ AI to evaluate various quality metrics, offering insights into areas needing improvement to ensure project deliverables meet established standards.

Decision Support Systems

- **Scenario Analysis and Simulation:** Use AI to simulate diverse project scenarios based on current data, aiding project managers in making well-informed decisions by anticipating the outcomes of various actions.
- **Recommendation Engines:** Implement AI-based recommendation systems within your PMIS to propose actions based on the current project status, historical decisions, and established best practices.

Custom AI Integrations

- **Tailored AI Solutions:** For specific project needs, consider developing bespoke AI solutions that can seamlessly integrate with your PMIS, tackling unique project challenges effectively.

8.4 Navigating Potential Challenges

While AI integration with PMIS presents a promising avenue for enhancing project management, it's crucial to address potential hurdles such as data quality, change management, and ensuring compliance with security and privacy standards.

By strategically embedding AI within your PMIS, you can unlock unprecedented levels of project management efficiency and insight. This approach not only simplifies administrative tasks but also equips project managers with actionable intelligence, facilitating the navigation of complex projects with greater ease and accuracy.

8.5 Sentiment analysis for stakeholder feedback

Integrating sentiment analysis into project management, especially for scrutinizing stakeholder feedback, is a forward-thinking use of Generative AI (GenAI) that can significantly elevate stakeholder engagement and project alignment. Sentiment analysis, a branch of natural language processing (NLP), facilitates the automated discernment and categorization of emotional undertones within text, offering critical insights into stakeholders' perceptions and attitudes toward the project. Here's how sentiment analysis can be practically applied to stakeholder feedback in project management:

Understanding Stakeholder Sentiments

- **Feedback Aggregation:** Employ sentiment analysis to compile and scrutinize feedback from diverse channels, such as emails, survey responses, social media, and meeting minutes. This broad analysis yields a comprehensive view of stakeholder sentiments.
- **Trend Identification:** Detect prevailing trends and shifts in stakeholder feedback over time, spotlighting changes in satisfaction or concerns, thereby enabling proactive issue resolution.

Enhancing Communication and Reporting

- **Personalized Communication:** Tailor stakeholder communications by analyzing sentiment, ensuring responses are empathetic and resonate with the stakeholders' emotional tone.
- **Reporting Insights:** Integrate sentiment analysis findings into periodic project reports, offering stakeholders a glimpse into the collective mood and sentiment, enhancing transparency and trust.

Improving Decision-Making

- **Stakeholder Prioritization:** Identify key stakeholders with pronounced sentiments towards the project using sentiment analysis, facilitating

targeted engagement strategies to address their concerns or capitalize on their support.
- **Impact Analysis:** Evaluate how project decisions might influence stakeholder sentiments, steering decisions toward options likely to sustain or enhance stakeholder satisfaction.

Risk Management

- **Risk Identification:** Employ sentiment analysis as an early detection system for risks tied to stakeholder dissatisfaction, enabling timely interventions.
- **Change Management:** Monitor sentiment shifts during significant change phases to assess communication and change management effectiveness, adjusting tactics as necessary to maintain stakeholder endorsement.

Enhancing Product and Service Development

- **User Feedback Analysis:** In product or service development projects, sentiment analysis can uncover user satisfaction levels and improvement areas, guiding product strategy.
- **Feature Prioritization:** Determine stakeholder sentiment regarding specific product or service features to inform development focus areas based on stakeholder preferences.

8.7 Navigating Challenges

While sentiment analysis brings substantial advantages, addressing potential hurdles is crucial:

- **Contextual Understanding:** Ensure the sentiment analysis tool comprehends the context and subtleties of project communications to avoid misinterpretations.
- **Cultural Sensitivity:** Acknowledge cultural variances in communication styles that might influence sentiment analysis outcomes, adapting methods to accommodate diverse stakeholder groups.
- **Data Privacy:** Adhere to data privacy laws and ethical standards when analyzing stakeholder communications, ensuring stakeholders consent to and are aware of the feedback analysis.

Incorporating sentiment analysis into the management of stakeholder feedback empowers project managers with profound insights into stakeholder attitudes, fostering informed decision-making, refined communication strategies, and anticipatory risk management. This strategy not only aligns project goals with stakeholder expectations but also cultivates a more engaged and supportive stakeholder base, contributing significantly to project success.

Ex. 8 Practice: Risk Identification, Risk Mitigation Tasks, Tasks to User Stories, Stories to WBS

miro.com/app/board/uXjVNvgYjwY=/?share_link_id=797673177801

Instructions: In this practice session we will continue working with the AI-generated content from the last sentiment analysis exercise to generate tasks you've identified as a result.

Upload the stakeholder survey data again to your AI agent. Also upload the results of your sentiment analysis from the last exercise. If you like, you can use the finished sentiment analysis report we provided as an example in the last exercise. Here is the link:

03_Project Apex_ Data Assessment Stakeholder Sentiment Analysis.pdf

Using any of the prompts below, or prompts of your own, guide the AI agent through the process of:

1. Identifying risks to the project based on the survey data and the sentiment analysis
2. Create risk mitigation strategies to respond to the risks
3. Ask the AI to produce specific needed work organized by function and/or role
4. Create user stories for the various roles based on the work
5. Generate tasks and task categories to complement the user stories
6. Use the AI to transform the user stories into a WBS. Ask the agent to generate the WBS in a "top-down WBS diagram" and make sure to have it include the prefix numbers for each task.
7. Use the Miro PlantUML app to transform the code into a WBS diagram. Paste your diagram into the Miro board in your room's area.

8.8 Interfacing with code: Spot checking, evaluating tests, and a BDD and ATDD project primer

Generative AI (GenAI) tools can significantly enhance your understanding of technical aspects of projects, even if you are not a coding expert. This exercise aims to provide practical experience in leveraging GenAI to assist with code-related tasks, bridging the gap between project management and technical execution.

Incorporating GenAI into the development and testing phases of project management, particularly through the lenses of Behavior-Driven Development (BDD) and Acceptance Test-Driven Development (ATDD), can greatly enhance the efficiency and effectiveness of these processes. Here's how GenAI can be integrated to optimize these critical phases:

Interfacing with Code through GenAI

- **Spot Checking:** Utilize GenAI to conduct spot checks on the project's codebase, identifying potential errors or areas for improvement swiftly. This proactive approach helps in mitigating minor issues before they evolve into significant problems, maintaining code quality throughout the development lifecycle.
- **Evaluating Tests:** Employ GenAI to assess the comprehensiveness and effectiveness of existing test cases. By analyzing test coverage and pinpointing gaps, GenAI can recommend enhancements or additional tests required, bolstering the robustness of the product.

Integration with BDD and ATDD

The fusion of GenAI with BDD and ATDD methodologies can streamline these approaches, enhancing their efficiency and accessibility:

BDD Primer: BDD revolves around defining simple, understandable scenarios that reflect the desired behavior of the system from an end-user perspective. GenAI can aid in crafting these scenarios based on project requirements, ensuring a seamless translation of stakeholder expectations into testable specifications.

ATDD Primer: ATDD takes BDD a step further by focusing on defining acceptance criteria and tests from the user's viewpoint before the onset of development. GenAI can be instrumental in generating these acceptance tests, aligning them with user stories and acceptance criteria, thus fostering improved communication between stakeholders and the development team.

Enhancing Collaboration and Communication

Integrating GenAI in code interfacing, especially within BDD and ATDD frameworks, can significantly improve collaboration among project managers, developers, testers, and stakeholders:

- **Automated Documentation:** GenAI can automate the generation of documentation for BDD scenarios and ATDD acceptance tests, ensuring clarity and consistency in team communications.
- **Feedback Loops:** GenAI's capability to provide instantaneous feedback on code quality and test coverage encourages a culture of continuous improvement and collaborative learning within the project team.

Navigating Challenges

While the integration of GenAI presents numerous advantages, it's essential to be mindful of potential challenges:

- **Managing Complexity:** It's crucial to ensure the selected GenAI tool is capable of handling the complexity of the project's codebase and the intricacies of BDD and ATDD methodologies.
- **Team Training and Adaptation:** Teams may need training to effectively utilize GenAI tools within their workflows, particularly in interpreting GenAI-generated suggestions within the context of BDD and ATDD.
- **Ensuring Quality Assurance:** Despite GenAI's ability to aid in identifying issues and evaluating tests, human oversight remains indispensable to guarantee the quality and applicability of the outcomes.

By thoughtfully implementing GenAI to interface with code and weaving it into BDD and ATDD methodologies, experienced project managers can substantially streamline development and testing processes. This not only makes these stages more efficient but also ensures that the final product closely meets user expectations and requirements, leading to more successful project deliveries.

Ex. 9 Practice: Interfacing with Code

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🗀 **HHA-core-java-code**

Instructions: In this practice session we will play around with using our generative AI agent to access portions of software code and extract information that might be useful to us as a project manager. The link above contains a portion of publicly available government Java code we will use to perform basic analysis and review in ways that could assist us in our project work. Download these Java files, and then use your AI agent to do some or all of the following:

NOTE: For this exercise, it's probably easiest to just copy and paste the code from the files directly into your AI chat prompt. None of the files are large enough to require uploading the file itself.

More details and prompt examples for performing these queries are in the Miro board:

- **Non-technical summarization of what code does**
- **Code Quality Check**
- **Performance Review**
- **Error Handling Assessment**
- **Security Vulnerability Scan**
- **Documentation Evaluation**
- **Dependency and Integration Analysis**
- **Code Complexity Review**
- **Test Coverage Inquiry**
- **Resource Utilization Check**
- **Compliance and Standards Verification**

8.9 AI-powered search and information retrieval

Integrating Generative AI (GenAI) for advanced search and information retrieval transforms project management into a more dynamic and efficient practice, especially in handling the complexities of large-scale projects. This integration empowers project managers to swiftly navigate vast data landscapes, enhancing decision-making and operational efficiency. Here's how this can be practically applied:

Advanced Search Capabilities

- **Natural Language Processing:** Enable project managers to use natural language for searches, making it straightforward to locate relevant information without precise keywords, streamlining the information retrieval process.
- **Contextual Understanding:** GenAI can grasp the context surrounding search inquiries, ensuring the results are not only accurate but also aligned with the specific nuances and terminologies of the project.

Efficient Information Retrieval

- **Deep Document Analysis:** Utilize GenAI to delve into project documents and databases, extracting crucial information and significantly cutting down the time traditionally spent on manual searches.
- **Unified Search Experience:** Ensure AI-powered search encompasses all project management tools, providing a cohesive search experience across emails, documents, project plans, and other platforms.

Knowledge Management

- **Dynamic Knowledge Bases:** Employ GenAI to systematically organize project knowledge, facilitating the creation of searchable, evolving knowledge bases that enhance project intelligence over time.
- **Access to Historical Insights:** GenAI can pinpoint and retrieve key learnings and best practices from past projects, promoting knowledge transfer and fostering a culture of continuous improvement.

Real-Time Data Access

- **Instantaneous Updates:** Configure GenAI tools to offer real-time data access, ensuring project teams operate with the latest information, keeping the project aligned with current conditions.

- **Proactive Alerts:** Use GenAI to monitor data streams, alerting project managers to critical updates or changes necessitating immediate action, thereby maintaining project responsiveness.

Enhanced Collaboration

- **Collaborative Search Platforms:** Create environments where teams can collaboratively search for, annotate, and share information, bolstering teamwork and collective intelligence.
- **Tailored Information Feeds:** Allow customization of information feeds to match individual roles and needs within the project team, ensuring information relevance and reducing information overload.

Navigating Challenges

While the potential of AI-powered search is immense, it's crucial to address inherent challenges:

- **Data Integrity:** The utility of AI in search functions is contingent on the quality and organization of data. It's essential to maintain clean, structured data for optimal GenAI performance.

- **Integration Hurdles:** Seamlessly integrating GenAI search capabilities across various project management platforms can be complex and requires meticulous planning and execution.

- **User Proficiency:** Ensuring that project managers and teams are adept at utilizing these advanced search tools is vital. This may necessitate dedicated training sessions to fully harness the benefits of GenAI.

Incorporating AI-powered search and information retrieval within project management not only streamlines administrative tasks but also significantly enriches the project management process. It ensures that project managers and their teams can quickly access vital information, respond to project developments agilely, and base decisions on the most current data, driving projects towards more successful outcomes.

8.10 Text summarization for efficient reporting

Implementing text summarization through Generative AI (GenAI) into project management significantly streamlines reporting and documentation tasks, making it an invaluable tool for project managers overseeing extensive initiatives. This technology efficiently condenses large volumes of text into succinct summaries, providing essential insights quickly and aiding in swift decision-making. Here's a practical breakdown of its application in project management:

Executive Summaries

- **Project Status Reports:** Employ GenAI to craft executive summaries from detailed reports, spotlighting critical progress indicators, milestones, and concerns, enabling stakeholders to swiftly grasp the project's status.
- **Meeting Minutes:** Generate concise summaries from extensive meeting transcripts to outline key discussions, decisions, and follow-up actions, keeping all stakeholders aligned and informed.

Risk and Issue Management

- **Risk Reports:** Summarize comprehensive risk assessments to emphasize top risks, impacts, and countermeasures, making risk management more accessible and actionable.
- **Issue Tracking:** Transform detailed issue logs into brief reports that highlight urgent matters, their resolution status, and actions taken, facilitating efficient issue resolution.

Documentation and Knowledge Sharing

- **Technical Documents:** Simplify intricate technical documents into understandable summaries for broader stakeholder comprehension without diluting the technical essence.
- **Best Practices and Lessons Learned:** Distill critical insights from project retrospectives, encapsulating valuable lessons and practices for future project endeavors.

Communication Enhancement

- **Stakeholder Updates:** Craft tailored summaries for diverse stakeholder groups, focusing on the most pertinent information to enhance communication effectiveness.
- **Email Management:** Utilize text summarization to quickly decipher lengthy email threads, enabling prompt and informed responses.

Data Analysis and Reporting

- **Survey and Feedback Analysis:** Condense findings from stakeholder or customer surveys into thematic summaries, guiding project improvements and stakeholder engagement strategies.
- **Performance Analytics:** Boil down complex data and analytics into key insights, fostering a culture of data-driven decision-making within the project team.

Challenges and Considerations

While text summarization brings numerous advantages to project reporting, it's crucial to navigate potential pitfalls:

- **Accuracy and Context:** Guarantee that the summarization AI faithfully captures the original text's context and nuances, especially in technical or specialized content.
- **Customization:** Adjust the summarization process to meet the unique needs and preferences of different stakeholder groups, ensuring summaries are pertinent and meaningful.
- **Integration:** Integrate text summarization capabilities seamlessly with existing project management tools and systems to maintain workflow continuity and maximize efficiency.

Incorporating GenAI for text summarization in project management not only saves time but also elevates the quality of stakeholder communication and decision-making processes. This approach allows for the quick extraction of critical information from extensive datasets, ensuring that project teams and stakeholders stay focused on key insights, ultimately leading to more streamlined and successful project outcomes.

Ex. 10 Practice: Extracting useful information from meeting transcript data

miro.com/app/board/uXjVNvgYjwY=/?share_link_id=797673177801

🗀 **project-call-transcripts**

Instructions: This folder has four documents containing raw, unedited meeting recording transcripts from various project stakeholders at various points in project Apex. However, our IT team has not done a good job tagging the metadata or formatting the content of the transcripts, so they are hard to read. Download the four text documents, and using any of the prompts below, use an AI tool of your choice to ingest and extract useful insights from the raw data. By the time you are done, make sure to have some of the following ready to share so we can discuss as a group:

1. **Overall summaries of the meeting topics and themes**
2. **Stakeholders who participated in the meeting**
3. **Risks that can be identified from the meeting content**
4. **Action items that were discussed in the meeting**
5. **Summaries of decisions made during the meeting**
6. **Sentiments we can derive from things stakeholders said in the meeting**
7. **Summaries of impact to the project budget and schedule**
8. **Summaries of impact to the project scope**
9. **Recommendations for next steps**
10. **Recommendations for risk mitigation**

9. Implementing AI within Project Management Frameworks

By now, we've gotten our hands dirty enough that we should have a lot of ideas for specific AI use cases in our project management work. Now, let's consider how they might fit in our overall project management framework, whether it's modeled after the PMBOK, PRINCE2, or a hybrid agile type of project approach. No matter what framework we use, applying AI throughout the project lifecycle offers the promise of dramatically increased efficiency for project managers who manage large-scale projects, from initiation to closure.

Let's take a look at how AI can be practically applied across different phases and domain areas of project management, regardless of which specific framework we use. We'll start by organizing these use cases by the basic process groups described in the PMBOK Guide, but they can be applied in other frameworks as well.

9.1 AI in Project Initiation

Incorporating Artificial Intelligence (AI) into the initiation phase of a project management framework can substantially enhance the foundational aspects of project planning and stakeholder engagement. This integration can provide a strategic edge in setting clear, informed project visions and objectives. Here's a closer look at the potential applications and benefits of AI during this critical phase:

Defining Project Vision and Goals

- **AI-Powered Brainstorming:** Utilize AI tools to stimulate creative brainstorming sessions. These tools can propose innovative solutions and approaches by analyzing current industry trends, competitive landscapes, and insights from historical project data, thereby enriching the brainstorming process with data-driven suggestions.
- **Stakeholder Analysis:** Leverage AI algorithms to delve into historical interactions and feedback from stakeholders. By predicting their expectations and potential reservations early on, AI ensures that the project's vision resonates with key stakeholders, aligning their interests and securing their buy-in from the outset.

Conducting Feasibility Studies

- **Predictive Analysis:** Employ AI to rigorously assess the project's feasibility, leveraging extensive datasets to forecast potential outcomes, identify risks, and estimate success probabilities. This analysis draws on

patterns and learnings from similar past projects, offering a predictive lens to evaluate the new initiative's viability.
- **Cost and Benefit Projections:** Utilize AI models to generate detailed forecasts of project costs, anticipated benefits, and ROI. These projections aid in crafting a compelling business case, providing stakeholders with a clear picture of the project's financial landscape and its strategic value.

Developing a Project Charter

- **Automated Charter Creation:** Apply Generative AI (GenAI) to automate the drafting of project charters. By inputting fundamental project details, GenAI can suggest comprehensive objectives, deliverables, and key milestones, extrapolating from data on similar previous projects to ensure a well-rounded charter.
- **Risk Identification:** AI can proactively identify potential project risks during the initiation phase by analyzing the defined scope and comparing it with historical project outcomes, facilitating early risk management strategies.

Practical Applications

- **Scenario Simulation:** AI can simulate various project scenarios before finalizing the initiation details, evaluating the potential impact of different strategies on project timelines, budgets, and overall success. This allows for a more flexible and informed approach to project planning.
- **Stakeholder Sentiment Analysis:** Implement sentiment analysis to understand stakeholders' perceptions of the proposed project vision and objectives, ensuring the project is aligned with stakeholder expectations and has their full support.

Navigating Challenges

- **Data Dependency:** The effectiveness of AI applications during project initiation heavily relies on the availability of comprehensive and high-quality data. Ensuring access to relevant datasets is pivotal for the success of AI-driven processes.
- **Bias and Ethics:** It's essential to remain vigilant about potential biases in AI algorithms and the data they analyze. Ethical considerations must be at the forefront of AI integration, especially when analyzing stakeholder sentiments and making project-related predictions.
- **Change Management:** Introducing AI into traditional project initiation processes may require significant change management efforts. It's crucial to prepare stakeholders for this shift, highlighting the benefits while addressing any concerns regarding new methodologies and tools.

Integrating AI at the initiation stage of project management not only refines the project planning process with data-driven insights but also ensures a higher degree of stakeholder engagement and project alignment. This forward-thinking approach lays a robust foundation for project success, leveraging technology to streamline and enhance traditional project management practices.

9.2 AI in Project Planning

The integration of Artificial Intelligence (AI) during the planning phase of project management revolutionizes how project managers approach scoping, scheduling, budgeting, and resource allocation. AI's predictive analytics, automation, and advanced data processing capabilities offer valuable tools for developing detailed and feasible project plans, and assisting with all sorts of work we do in the planning phase.

Scoping with AI

- **Automated Scope Definition:** AI can automate the process of defining project scope by analyzing project requirements and historical project data, suggesting comprehensive deliverables and clear boundaries, thereby reducing the risk of omissions.
- **Scope Creep Prediction:** AI's ability to predict potential scope creep based on project parameters and historical trends enables project managers to incorporate preventive measures in the initial plan, safeguarding the project against unplanned expansions.

AI-Enhanced Scheduling

- **Predictive Scheduling:** AI algorithms can be used to create realistic project timelines by analyzing past project performances, resource availability, and external factors, ensuring schedules are both achievable and optimized.
- **Dynamic Scheduling Adjustments:** AI can continuously monitor project progress and automatically adjust schedules to accommodate unforeseen changes or delays, keeping the project on track toward its milestones.

Budgeting with AI

- **Cost Prediction Models:** AI provides accurate cost estimations by examining similar past projects and current market conditions, offering a reliable budget forecast that accounts for various financial variables.
- **Real-Time Budget Monitoring:** AI tools can track project expenditures in real-time, alerting managers to potential budget overruns and suggesting immediate corrective actions to stay within financial boundaries.

Resource and Capacity Planning

- **Resource Allocation:** AI can analyze team members' skills, past performances, and current workloads to recommend the most effective distribution of human and material resources across project tasks.
- **Demand Forecasting:** AI's forecasting capabilities allow for the anticipation of resource demands throughout the project lifecycle, facilitating timely resource acquisition and minimizing bottlenecks.

Practical Applications

- **Virtual Planning Assistants:** AI-powered virtual assistants can guide project managers through the planning process, providing data-driven suggestions, reminders, and insights into best practices.
- **Collaborative AI Tools:** These tools enable team-wide contributions to the planning process, ensuring diverse insights and perspectives are considered, enriching the project plan with collective intelligence.

Challenges and Considerations

- **Integration with Existing Systems:** Seamless integration of AI tools with current project management software and workflows is critical to maintain efficiency and avoid productivity disruptions.
- **Training and Adoption:** The introduction of AI-enhanced tools may necessitate training for project teams, underscoring the importance of investing in skill development and change management initiatives.
- **Ethical and Privacy Concerns:** Utilizing AI in planning, especially for sensitive tasks like resource allocation, necessitates careful consideration of ethical implications and adherence to privacy regulations.

Incorporating AI into the planning stage empowers project managers to devise more accurate, adaptable, and informed project plans. The proactive, data-driven approach fostered by AI not only anticipates potential challenges but also identifies opportunities for optimization, setting the stage for more successful and efficient project execution.

9.3 AI in Project Execution

Advancing to the execution phase of the project management framework, AI can play a role in streamlining operations, enhancing efficiency, and ensuring adherence to the project plan. During execution, the focus shifts to implementing the project plan, coordinating team activities, and managing resources effectively. AI can play a pivotal role in these areas by automating routine tasks, providing real-time insights, and facilitating adaptive decision-making.

The execution phase is where the project's plans are put into action. AI's role here is to ensure that activities proceed according to plan, to optimize resource utilization, and to adapt to any emerging challenges or opportunities.

Automated Progress Updates

- **Real-Time Monitoring:** Deploy AI systems to continuously monitor project progress against the plan, automatically updating task statuses based on data from various sources like emails, project management tools, and team reports.
- **Predictive Alerts:** Utilize AI to predict potential delays or issues based on current trends and historical data, providing early warnings to project managers to take corrective action.

Resource Optimization

- **Dynamic Resource Allocation:** Implement AI algorithms to dynamically reallocate resources based on real-time project needs, optimizing productivity and reducing bottlenecks.
- **Efficiency Analysis:** Use AI to analyze work patterns and identify inefficiencies, suggesting process improvements or automation opportunities to increase overall project efficiency.

Decision Support

- **AI-Driven Recommendations:** Leverage AI to offer data-driven recommendations for critical decisions, such as prioritizing tasks, reallocating resources, or adjusting timelines, based on an analysis of current project data and historical outcomes.
- **Scenario Simulation:** Apply AI to simulate various decision outcomes, helping project managers assess the potential impact of their choices on project timelines, costs, and quality.

Practical Applications

- **AI-Assisted Task Management:** Integrate AI tools that assist in task assignment and tracking, using natural language processing to interpret updates and adjust task statuses accordingly.
- **Quality Control Automation:** Employ AI in quality control processes, particularly in software development and engineering projects, to automatically review code, test products, and report on quality metrics.

Challenges and Considerations

- **Data Integration:** Ensuring comprehensive and seamless integration of data from all project activities into the AI system is crucial for accurate monitoring and analysis.
- **Change Management:** The introduction of AI into project execution processes may require significant changes in team workflows and practices. Effective change management strategies are essential to facilitate a smooth transition.
- **Transparency and Trust:** Building trust in AI-driven decisions and recommendations among project teams is vital. Transparency in how AI algorithms arrive at conclusions can help in gaining team acceptance.

Integrating AI into the execution phase of project management can significantly enhance the agility and responsiveness of project teams. By automating routine tasks, providing real-time insights, and enabling data-driven decision-making, AI supports project managers in ensuring that project execution aligns closely with planned objectives and timelines, leading to improved project outcomes.

9.4 AI in Project Monitoring, Controlling, & Progress

The "Monitoring and Controlling" phase is pivotal in the project management lifecycle, ensuring that the project stays aligned with its objectives while managing risks and maintaining quality. The integration of Artificial Intelligence (AI) during this phase can significantly augment these processes through advanced analytics, real-time oversight, and predictive insights.

AI offers the promise of assistance for helping monitor critical project metrics, foresee potential deviations, and recommend adjustments, bolstering the project's adherence to its planned trajectory and objectives.

Performance Tracking and Metrics Analysis

- **Automated KPI Tracking:** AI can autonomously monitor Key Performance Indicators (KPIs), generating comprehensive reports that delineate progress, pinpoint productivity levels, and identify deviations from the set project plan.

- **Predictive Performance Analysis:** Utilize AI models to juxtapose current project data against historical performances, predicting potential hurdles or delays, thereby enabling preemptive course corrections.

Risk Analysis and Mitigation

- **Dynamic Risk Assessment:** AI continuously reevaluates project risks in light of new data, spotlighting emerging threats and assessing their potential impact, ensuring a dynamic risk management strategy.
- **Mitigation Strategy Optimization:** AI draws from historical risk response databases to recommend effective mitigation strategies, enhancing the project's resilience against uncertainties.

Change Impact Analysis

- **Change Prediction and Management:** AI predicts the repercussions of proposed changes on the project's scope, schedule, budget, and quality, aiding in well-informed decision-making processes.
- **Automated Change Control:** AI systems manage change requests efficiently, assessing and routing them based on established criteria and historical insights, streamlining the change control process.

Quality Control

- **AI-Assisted Quality Checks:** Implement AI tools for automated quality assessments of project deliverables, ensuring they meet established standards and requirements.
- **Feedback Loop for Continuous Improvement:** AI analyzes quality check results and stakeholder feedback, identifying improvement areas and trends, fostering a culture of continuous enhancement.

Practical Applications

- **Real-Time Dashboards:** AI-powered dashboards offer a live overview of project health, encapsulating performance metrics, risk statuses, and change request updates, providing stakeholders with timely insights.
- **Sentiment Analysis for Feedback:** Apply sentiment analysis to understand the project team's and stakeholders' sentiments, offering valuable insights that can guide project adjustments.

Challenges and Considerations

- **Data Complexity and Volume:** AI's efficacy in this phase is contingent on managing and analyzing vast and complex data sets from diverse sources, making data quality and integrity crucial.

- **Algorithm Transparency:** To ensure AI-generated recommendations are trusted and actionable, the underlying algorithms must be somewhat transparent and explainable to project managers.
- **Balancing Automation and Human Insight:** While AI significantly enhances the monitoring and controlling processes, the nuanced dynamics of project management still necessitate human expertise and judgment.

Integrating AI into the "Monitoring and Controlling" phase enables project managers to not only keep a vigilant eye on project performance but also to manage risks and quality proactively. This AI-enhanced approach ensures projects remain on course, adapting dynamically to new insights and challenges, ultimately paving the way for successful project outcomes.

9.5 AI in Project Closure

The "Closure" phase in project management marks the conclusion of project activities, focusing on ensuring all objectives have been met, finalizing deliverables, and reflecting on lessons learned. The integration of Artificial Intelligence (AI) during this phase can significantly streamline these processes, offering advanced tools for automated documentation, in-depth performance analysis, and effective knowledge capture, thereby enhancing the overall project wrap-up.

Project Documentation

- **Automated Reporting:** AI can compile and generate comprehensive final project reports autonomously, encompassing outcomes, performance metrics, and summaries of deliverables, ensuring consistency and depth in documentation.
- **Lessons Learned Analysis:** Utilize AI to sift through project data, communications, and stakeholder feedback, extracting pivotal lessons, best practices, and improvement areas, and organizing this knowledge for future accessibility.

Success Criteria Evaluation

- **Performance Metrics Analysis:** AI tools critically assess project performance against predefined success criteria, detailing accomplishments, shortcomings, and areas of overachievement, providing a nuanced performance overview.
- **Stakeholder Feedback Processing:** AI aggregates and interprets stakeholder feedback, offering valuable insights into satisfaction levels and pinpointing areas for enhancement.

Deliverable Tracking and Handover

- **Automated Deliverable Checklist:** AI ensures all project deliverables are accounted for, approved, and properly transitioned, employing automated checklists and tracking systems to monitor each deliverable's status.
- **Knowledge Transfer Facilitation:** AI organizes project knowledge, deliverables, and documentation into accessible and user-friendly formats, supporting seamless knowledge transfer for ongoing operations or subsequent projects.

Practical Applications

- **Digital Project Closure Binders:** Implement AI to create comprehensive digital "closure binders" that encapsulate essential project information, reports, and lessons learned, presented in an interactive and easily navigable format.
- **Continuous Learning Journals:** AI maintains "learning journals" that chronicle insights, decisions, and outcomes from projects, employing natural language processing to render this knowledge searchable and applicable for future initiatives.

Challenges and Considerations

- **Data Completeness:** Guaranteeing the comprehensive capture and availability of relevant project data for AI analysis is crucial for effective closure activities.
- **Stakeholder Engagement:** It's vital to sustain active stakeholder engagement during the closure phase, utilizing AI as a supportive tool rather than a substitute for personal interactions and feedback mechanisms.
- **Ethical Use of AI:** Ethical considerations, particularly in analyzing team performance and stakeholder sentiments, must be judiciously managed, ensuring transparency and adherence to privacy norms.

Leveraging AI in the project closure phase ensures a detailed and insightful project wrap-up, capturing invaluable knowledge and feedback that fosters continuous improvement in project management practices. This AI-enhanced approach not only simplifies the closure process but also enriches the organizational knowledge base, laying a solid foundation for the success of future projects.

Ex. 11 Practice: Using the AI Data Analyst to analyze Project Apex Jira data

miro.com/app/board/uXjVNvgYjwY=/?share_link_id=797673177801

Apex-all-issue-export-v2.csv

Instructions: The last few exercises in the course will be a little unstructured. The priority is on using your own creativity and what you anticipate needing the most to guide your practice.

1. The dataset above contains an export of Jira data for Project Apex, our LLM project at Contoso Pharmaceuticals. In addition to this data, you have the Sheets+Gemini tool you learned how to use earlier in class, and you have a healthy sense of how to use well-crafted prompting and dialectic logic for interacting with AI agents.

2. In the Miro board, we've provided a system message for your AI agent and a list of possible prompts you can use to analyze the Jira data. Try some of these prompts, but also try some of your own.

3. As we've just finished discussing project management use cases in different phases of a project life cycle, come up with some ideas about how to use your AI agent to do things you would need to do in these project phases. Use the project Apex Jira data to try these out.

4. We've provided areas that correspond to the phases of the project life cycle in the Miro board. After you're done working with the Jira data, place a few sticky notes on the board sharing what you've learned. We'll discuss together whne the exercise time is up.

10. AI Integration Across Domain Areas

10.1 Strategic Continuity for Better Project Outcomes

Now that we've thought a little about the application of AI assistance in particular process groups and phases, we should consider our AI strategy as a strategic integration of AI across the entire landscape of project management. With continuity and good data governance, AI can augment our work as we do things we generally have to do no matter where we are in the life cycle of a project. For instance, stakeholder communication using personalized updates and feedback analysis, or risk management by identifying and mitigating potential issues before they escalate - these are areas where AI will always have something to offer.

Data and insights generated in earlier phases inform decision-making in subsequent ones. This continuity is vital for maintaining a coherent strategy and leveraging AI's full potential to optimize project outcomes. Clear data governance can ensure consistency and accuracy of AI-generated insights and foster a culture of continuous learning within project teams to adapt to AI-driven methodologies. This type of continuity and holistic AI usage will help every project phase be more efficient and informed by data-driven insights. **Here are some possibilities to consider when evaluating your own AI applications throughout the entire project life cycle:**

- **Cross-Phase Learning:** Implement a centralized AI system capable of learning from experiences across all project phases, refining predictions and recommendations for future endeavors based on accumulated insights.
- **Stakeholder Engagement:** Throughout the project, leverage AI to enhance stakeholder communication, ensuring consistent updates and efficient feedback collection.
- **Compliance and Governance:** Use AI to ensure adherence to industry standards and internal policies across the project lifecycle, guaranteeing that all deliverables meet the requisite quality and compliance benchmarks.
- **AI-Driven Project Stage Breakdown:** AI can dissect the overarching project scope and objectives to recommend an optimal segmentation into manageable stages, outlining specific goals and deliverables for each, thereby ensuring a structured and focused approach.
- **Dynamic Scheduling:** Utilize AI algorithms to craft schedules which track the impacts of one phase's timeline to others, incorporating resource availability, inter-task dependencies, and insights from historical data to forecast what's realistic and achievable.
- **Predictive Analytics for Milestone Completion:** AI's predictive capabilities can foresee potential delays or roadblocks, enabling preemptive strategy adjustments to keep a project on track throughout its life cycle.
- **Automated Quality Checks:** AI tools can perform automated assessments of stage deliverables against set standards, ensuring quality assurance before progressing to subsequent stages.

- **Milestone Achievement Analysis:** AI analyses task completions, deliverable quality, and stakeholder feedback to confirm the successful attainment of milestones, ensuring a solid foundation for stage closure.
- **Stage Gate Reviews:** Incorporating AI into stage gate review processes enriches decision-making with comprehensive data analyses and predictive insights, guiding critical go/no-go decisions and facilitating smoother transition from one part of a project phase to another.
- **Feedback Loops for Continuous Improvement:** AI establishes feedback mechanisms within and across the project life cycles, capturing valuable lessons and best practices for real-time application, enhancing ongoing and future execution.

Challenges and Considerations

- **Data Integration Across Stages:** It's essential to maintain data continuity across stages, ensuring AI systems can effectively leverage accumulated insights and consistency of behavior as the project progresses.
- **Adaptability to Change:** Projects are dynamic; AI systems and processes must be designed to accommodate scope changes, resource reallocations, and schedule adaptations, maintaining project agility.
- **Stakeholder Communication:** While AI can provide comprehensive reports and analyses, it's crucial to complement these with direct stakeholder interactions, ensuring clarity, consensus, and engagement throughout each phase of a project.

Incorporating AI in areas where it can assist across and throughout various stages and domain areas of project management empowers project managers to navigate each project phase with enhanced precision, oversight, and adaptability.

By leveraging AI for in-depth planning, real-time monitoring, and insightful analytics, each project stage can be executed with a higher degree of success, contributing significantly to the overarching project objectives. Next we'll touch on some key project management domain areas that span the entire project, and think about how to apply generative AI assistance through this lens.

10.2 AI in Risk Management

The integration of Artificial Intelligence (AI) into risk management processes within project management transforms traditional methodologies by offering a more dynamic, predictive, and efficient approach to identifying, analyzing, and mitigating risks.

Risk Identification

- **Predictive Risk Identification:** AI's ability to sift through vast amounts of project data, historical risk logs, and external sources enables early

detection of potential risks by identifying patterns and anomalies indicative of emerging threats.

- **Natural Language Processing (NLP):** NLP technologies can scan project documentation, communications, and stakeholder feedback, flagging words or phrases that might indicate underlying issues or concerns potentially escalating into risks.

Risk Analysis and Prioritization

- **Quantitative Risk Analysis:** AI algorithms can conduct in-depth quantitative analyses, assessing the probability and potential impact of identified risks. This assessment is based on historical data and predictive modeling, providing a data-driven approach to understanding risk dynamics.
- **Risk Prioritization:** AI aids in categorizing risks according to their potential impact on project objectives, enabling project managers to allocate resources and attention to the most significant threats.

Risk Communication

- **Automated Risk Reporting:** AI tools can automate the creation and distribution of risk reports, ensuring stakeholders are timely informed about current risks and their statuses, fostering a culture of transparency and proactive management.
- **Stakeholder Sentiment Analysis:** AI-driven sentiment analysis can evaluate stakeholders' reactions to risk communications, offering insights that can refine and improve risk communication strategies.

Risk Mitigation and Response

- **AI-Driven Response Planning:** AI can recommend risk response strategies by analyzing a vast repository of risk responses and outcomes from similar past projects, providing evidence-based recommendations for risk mitigation.
- **Dynamic Risk Mitigation:** AI systems can adapt risk mitigation plans in real-time to changes in the project environment or the evolving status of identified risks, ensuring that risk responses remain relevant and effective.

Practical Applications

- **Risk Dashboards:** Implement AI-powered risk dashboards that offer real-time insights into the project's risk profile, complete with predictive analytics and automated alerts for emerging risks, enhancing situational awareness and responsiveness.

- **Simulation and Scenario Analysis:** AI can simulate various risk scenarios and their potential impacts on the project, assisting in crafting comprehensive risk response strategies that are robust and flexible.

Challenges and Considerations

- **Data Quality and Availability:** The accuracy and effectiveness of AI in risk management hinge on the quality and completeness of the underlying data. Ensuring access to relevant and high-quality data sources is essential for meaningful risk analysis.
- **Algorithm Transparency and Bias:** Maintaining clarity on how AI models process data and offer recommendations is crucial to build trust in AI-driven decisions. Additionally, constant vigilance is required to identify and mitigate any biases inherent in AI algorithms.
- **Integration with Project Management Processes:** For AI-driven risk management to be truly effective, it must be seamlessly integrated into the broader project management framework, ensuring that insights and recommendations from AI tools inform and guide overall project decision-making.

Incorporating AI into risk management within project management not only streamlines the identification, analysis, and mitigation of risks but also imbues the process with a level of predictive insight and adaptability previously unattainable. This advanced approach equips project managers with the tools necessary to navigate uncertainties more effectively, contributing to the resilience and success of their projects.

10.3 AI in Stakeholder Engagement

The integration of Artificial Intelligence (AI) into stakeholder management within project management can significantly enhance how stakeholders are identified, engaged, and maintained throughout the project lifecycle. AI can automate and personalize communications, provide in-depth analysis of stakeholder feedback, and support strategic decision-making, ensuring stakeholders' needs and concerns are addressed efficiently.

Stakeholder Identification and Analysis

- **AI-Driven Mapping:** Utilize AI to systematically map out stakeholders by analyzing project data, historical interactions, and external databases. This process helps in identifying key individuals and groups, assessing their potential influence and interest in the project.
- **Sentiment Analysis:** Apply AI-powered sentiment analysis on stakeholder communications, including social media mentions, to understand their

perceptions, concerns, and overall sentiment towards the project, providing valuable insights into stakeholder attitudes.

Personalized Communication

- **Automated Updates:** Implement AI systems to craft personalized project updates for stakeholders, ensuring the content is relevant to their specific interests and concerns, thereby enhancing engagement and ensuring stakeholders are well-informed.
- **Natural Language Generation (NLG):** Use NLG technologies to automatically generate responses to stakeholder inquiries and feedback, offering timely and context-appropriate communication, which can significantly enhance stakeholder relations.

Feedback Analysis and Engagement

- **Feedback Aggregation and Analysis:** Employ AI to consolidate and scrutinize feedback from diverse channels, pinpointing prevalent themes, concerns, and suggestions, which can guide project improvements and stakeholder engagement strategies.
- **Proactive Engagement Strategies:** Utilize insights derived from AI analysis to devise proactive engagement strategies, aiming to address stakeholder concerns preemptively and foster a positive atmosphere around the project.

Decision-Making Support

AI-Assisted Decision Making: Integrate AI tools to bolster decision-making processes by taking into account stakeholder interests and predicting the potential repercussions of various decisions on stakeholder satisfaction and project endorsement.

Practical Applications

- **Stakeholder Engagement Portals:** Develop AI-enhanced portals dedicated to stakeholder engagement, offering personalized content, interactive communication channels, and live project updates, thereby promoting transparency and inclusivity.
- **Predictive Stakeholder Management:** Harness predictive analytics to anticipate stakeholder-related challenges or opportunities, enabling the project team to tailor engagement efforts more effectively and strategically.

Challenges and Considerations

- **Data Privacy and Ethics:** It's imperative to adhere to data privacy laws and uphold ethical standards when leveraging AI to analyze stakeholder

information and communications, ensuring stakeholders' privacy and trust are respected.
- **Cultural and Emotional Intelligence:** While AI can provide significant insights, human oversight is necessary to interpret cultural nuances and emotional contexts within stakeholder communications, areas where AI may fall short.
- **Integration with Overall Project Management:** AI tools designed for stakeholder management should be seamlessly integrated with the overall project management framework, ensuring consistent and coherent interactions with stakeholders.

Incorporating AI into stakeholder management empowers project managers to deepen their understanding of stakeholder needs, automate and personalize communication efforts, and refine engagement strategies. This innovative approach not only bolsters stakeholder satisfaction and support but also plays a crucial role in the successful execution and completion of projects.

10.4 AI in Change Management

Integrating Artificial Intelligence (AI) into change management within the project management framework can assist with how project alterations are handled, assessed, and communicated. Change management is pivotal for navigating modifications to project scope, schedule, budget, or objectives with minimal disruption and maximum stakeholder alignment.

AI has a lot to offer in the change management process, offering predictive insights on change impacts, streamlining the evaluation of change requests, and enhancing communication and training strategies.

AI Applications in Change Management

AI can be strategically leveraged to facilitate and enhance change management processes within organizations. This involves understanding the role of AI in identifying the need for change, planning and implementing change initiatives, and monitoring their effectiveness.

AI-Enhanced Identification of Change Needs:

- **Predictive Analytics for Trend Analysis:** Utilize AI's predictive analytics capabilities to analyze internal performance metrics and external market trends, identifying areas where change may be necessary to maintain or enhance competitiveness.
- **Sentiment Analysis for Stakeholder Feedback:** Apply Natural Language Processing (NLP) tools to assess stakeholder feedback, employee

satisfaction surveys, and social media comments to gauge organizational climate and resistance levels, pinpointing areas ripe for change.

Planning and Implementing Change with AI:

- **Scenario Modeling for Change Strategies:** Leverage AI to model various change scenarios and their potential impacts on the organization, aiding in the development of robust change strategies that minimize disruption and align with long-term goals.
- **AI-Driven Communication Plans:** Use AI to tailor communication strategies to various stakeholder groups, ensuring messages are clear, persuasive, and aligned with individual concerns and motivations, thereby reducing resistance.
- **Automated Training and Development:** Implement AI-powered training platforms to deliver personalized learning experiences, upskilling employees to meet the demands of the change initiative efficiently.

Monitoring and Adapting Change Initiatives:

- **Real-Time Progress Tracking:** Utilize AI tools to monitor the progress of change initiatives in real-time, providing immediate insights into adoption rates, process bottlenecks, and areas of resistance.
- **Feedback Loop for Continuous Improvement:** Establish an AI-enabled feedback loop that continuously collects data on the effectiveness of change initiatives, allowing for agile adaptations to strategies based on real-time insights.

Practical Application: Consider a project manager leading a digital transformation initiative within a traditional manufacturing company. By employing AI to analyze market trends and internal performance data, the need for digital upskilling and process automation is identified. AI scenario modeling helps in crafting a change strategy that minimizes operational disruption. Tailored AI-driven communication plans ensure all stakeholders are on board, while AI-powered training platforms facilitate efficient employee upskilling. Real-time AI monitoring allows the project manager to track the initiative's progress and adapt strategies as needed, ensuring the transformation's success.

Change Impact Analysis

- **Predictive Impact Modeling:** AI models can forecast the potential impacts of proposed changes on project timelines, costs, deliverables, and stakeholder satisfaction, providing crucial data-driven insights for informed decision-making.
- **Automated Change Evaluation:** AI systems can autonomously assess change requests against current project parameters, historical data, and the

existing project status, efficiently prioritizing and categorizing changes based on their projected impact.

Communication and Stakeholder Alignment

- **Personalized Communication:** AI enables the customization of communications regarding changes to different stakeholder groups, ensuring relevancy and fostering better understanding and support.
- **Sentiment Analysis for Feedback:** Utilize sentiment analysis on stakeholder feedback following change announcements to proactively identify and address concerns, maintaining stakeholder engagement and support.

Training and Support

- **AI-Powered Training Modules:** Dynamic, AI-driven training modules can adapt to individual learning preferences and speeds, ensuring project teams are well-equipped to implement changes.
- **Virtual Assistants for Support:** AI-powered virtual assistants offer real-time support and guidance, helping team members adapt to changes with on-demand information and assistance.

Adaptive Change Implementation

- **Dynamic Change Roadmaps:** AI facilitates the creation of flexible change implementation roadmaps that can adapt based on real-time feedback, project progress, and emerging challenges.
- **Continuous Learning and Adaptation:** AI systems designed to learn from each change process continuously refine change management strategies, improving efficiency and effectiveness over time.

Practical Applications

- **Change Management Dashboards:** Implement AI-enhanced dashboards for real-time tracking of change requests, impact analyses, stakeholder sentiments, and training progress, providing a comprehensive overview of the change management landscape.
- **Predictive Analytics for Change Success:** Predictive analytics can evaluate the likelihood of successful change implementation, factoring in team readiness, stakeholder support, and overall project alignment.

Challenges and Considerations

- **Change Complexity:** AI must be capable of understanding the multifaceted nature of project changes, necessitating sophisticated algorithms and rich data sets.

- **Human Factors:** The human elements of change management, such as leadership, empathy, and cultural sensitivity, remain indispensable and should complement AI-driven processes.
- **Data Integration and Privacy:** Effective change management with AI requires seamless integration with existing project management systems and strict adherence to data privacy standards.

Incorporating AI into change management enables project managers to navigate project changes with greater foresight, efficiency, and stakeholder harmony. This advanced approach not only optimizes the change management process but also ensures changes are implemented effectively, contributing significantly to the overall success and resilience of projects.

10.5 ADKAR example - Mapping AI-assisted change management to Prosci's popular framework

Using AI to augment a project manager's work within the framework of the ADKAR model of change management can significantly enhance the effectiveness and efficiency of managing change. The ADKAR model, which stands for Awareness, Desire, Knowledge, Ability, and Reinforcement, provides a structured approach to change management. Here's how AI can support each stage:

1. Awareness:

- **AI-Driven Data Analysis:** Use AI to analyze internal and external data to identify the need for change, providing concrete evidence and insights that help build awareness among stakeholders.
- **Automated Communication:** Utilize AI to craft and distribute personalized messages across various channels, ensuring all stakeholders understand the reasons behind the change.

2. Desire:

- **Sentiment Analysis:** Apply NLP to gauge employee sentiments and resistance levels, enabling targeted interventions to build a desire for change.
- **Personalized Engagement:** Use AI to create tailored engagement strategies, considering individual stakeholder profiles and past responses to change initiatives, to foster positive attitudes towards the change.

3. Knowledge:

- **Customized Learning Paths:** Implement AI-powered learning management systems to provide personalized training and resources,

aligning with each employee's learning pace and style, ensuring they acquire the necessary knowledge for the change.
- **FAQ Bots and Virtual Assistants:** Deploy AI chatbots to answer queries related to the change process, providing instant support and clarification to employees.

4. Ability:

- **Skill Gap Analysis:** Leverage AI to assess skill gaps and competencies required for the change, guiding targeted development programs.
- **Performance Support Tools:** Integrate AI-enhanced tools that offer real-time guidance and support as employees apply new skills and behaviors, facilitating the transition.

5. Reinforcement:

- **Data-Driven Feedback:** Use AI to continuously monitor and evaluate the change process, collecting data on performance, engagement, and feedback post-implementation.
- **Recognition Programs:** Implement AI systems to identify and reward positive behaviors and contributions to the change, reinforcing the desired outcomes.

Practical Application: Imagine a project manager leading a shift to a new project management software within an organization. AI can first help in creating awareness by analyzing and presenting data on inefficiencies of the current system. To build desire, sentiment analysis can identify departments resistant to change, allowing for targeted motivational strategies. AI-driven personalized learning paths ensure each employee acquires the necessary knowledge, while virtual assistants provide on-demand support as they gain the ability to use the new system. Finally, AI monitors adoption rates and employee feedback, enabling the project manager to reinforce the change through recognition of positive adopters and adjustment of ongoing support.

By integrating AI across the ADKAR model stages, project managers can more effectively guide their teams through change, ensuring a smoother transition and better alignment with organizational goals.

Ex. 12 Practice: Using the AI Data Analyst to analyze a basic financial report

miro.com/app/board/uXjVNvgYjwY=/?share_link_id=797673177801

Apex Data Pipeline Security Fix - Budget vs Actuals v3 - Data.csv

1. **Budget vs. Actual Analysis:**
   Compare budgeted costs to actual expenses for each project task to identify areas of over or under-spending.

2. **Monthly Expense Trends:**
   Analyze monthly expenses to understand spending patterns and identify any unexpected spikes or drops.

3. **Task-Specific Cost Analysis:**
   Evaluate the cost efficiency of individual tasks by comparing their estimated costs to actual expenditures.

4. **Variance Analysis by Category:**
   Break down the variance between estimated and actual costs by expense categories to pinpoint specific areas for financial adjustment.

5. **Resource Allocation Efficiency:**
   Assess the allocation of hours and costs per task to determine if resources are being utilized efficiently.

6. **Impact of Delays on Budget:**
   Investigate the financial impact of project delays, including any additional costs incurred due to extended timelines.

7. **Forecast Accuracy Evaluation:**
   Evaluate the accuracy of financial forecasts by comparing initial estimates with actual outcomes.

8. **Cost-Benefit Analysis of Changes:**
   Conduct a cost-benefit analysis for any mid-project changes or scope adjustments to understand their financial implications.

9. **Return on Investment (ROI) Assessment:**
   Calculate the ROI for the project or specific tasks to assess financial performance against objectives.

10. **Risk Mitigation Planning:**

Identify financial risk factors based on cost overruns and underutilization of resources, and propose strategies for mitigation.

11. Ethical and Practical Considerations in AI-assisted projects

Integrating AI into project management brings a host of benefits but also necessitates careful consideration of ethical, privacy, security, and legal aspects to ensure responsible use. Here are the main concerns we should be thinking about.

11.1 Ethical Considerations

- **Transparency:** Maintain transparency in AI decision-making processes, especially in critical areas like resource allocation and stakeholder communication, to ensure stakeholders understand how AI-generated recommendations are derived.

- **Fairness and Bias:** Proactively address potential biases in AI algorithms that could influence decision-making. Regular audits of AI systems are essential to identify and rectify biases related to gender, race, or other factors.
- **Accountability:** Clearly define accountability for decisions made with AI assistance, emphasizing that while AI can offer recommendations, the final responsibility lies with human decision-makers.

11.2 Data Privacy and Security

- **Data Handling:** Adhere strictly to data privacy best practices and legal requirements, ensuring all project data utilized by AI systems is managed securely and ethically. Secure necessary consents for data usage.
- **Data Protection:** Implement strong security measures to safeguard sensitive project data, particularly when AI processes personal or proprietary information.

11.3 Understanding AI Limitations

- **Realistic Expectations:** Educate project teams and stakeholders on AI's capabilities and limitations within project management, establishing realistic expectations about AI's potential impact.
- **Human Oversight:** Guarantee that AI-assisted decisions and operations are subject to human supervision, especially in complex scenarios where nuanced human judgment is indispensable.

11.4 Legal and Compliance Considerations

- **Regulatory Compliance:** Ensure AI usage in project management adheres to all applicable laws and regulations, including those concerning data protection, intellectual property, and industry-specific standards.
- **Contractual Obligations:** Review contracts and agreements related to AI tools and services to confirm alignment with project goals, ethical standards, and legal requirements.

11.5 Practical Applications

- **Ethical AI Frameworks:** Develop and implement a framework guiding the ethical use of AI in project management, detailing principles, practices, and checks.
- **Training and Awareness:** Conduct comprehensive training sessions on ethical AI usage, data protection practices, and legal considerations, fostering a culture of ethical awareness and compliance within project teams.

11.6 Challenges and Considerations

- **Keeping Pace with Technology:** The rapid evolution of AI technologies requires constant vigilance to stay updated on the latest advancements, ethical concerns, and best practices.
- **Balancing Efficiency and Ethics:** Navigating the balance between leveraging AI for increased efficiency and ensuring ethical, transparent, and equitable usage can be challenging, necessitating continuous evaluation and adjustment.

By addressing these ethical and practical considerations, project managers can leverage AI to enhance project management practices while ensuring trust, legal compliance, and sustainable project success. Prioritizing ethical practices, data privacy, and legal compliance allows project managers to capitalize on AI's benefits while mitigating potential risks and upholding stakeholder confidence.

12. Developing your AI-enabled project management approach

Crafting a strategic approach for integrating AI into project management is essential for harnessing AI's potential to enhance efficiency, decision-making, and project outcomes. Now it’s time to think about how you will structure your own approach for evangelizing AI-enabled project management – and broader enterprise AI strategy in general – after this class is over.

12.1 Necessities for Adoption

Clarify Goals: Establish clear objectives for the assessment, focusing on understanding the strengths and limitations of current project management practices and identifying opportunities where AI could drive improvements.

Current State Assessment: Conduct a comprehensive evaluation of existing project management processes, tools, and team capabilities to establish a baseline and identify areas for AI integration.

Here is an overview of adoption priorities.

Evaluate Project Management Processes

- **Process Efficiency:** Analyze the effectiveness and efficiency of existing project management processes, from initiation and planning to execution, monitoring, and closure.
- **Identify Challenges:** Pinpoint any bottlenecks or inefficiencies and assess areas where project outcomes fall short of expectations.

Gather Data

- **Process and Tool Analysis:** Collect detailed information on the project management methodologies, tools, and technologies currently in use. This may involve reviewing project documentation, software configurations, and process workflows.
- **Stakeholder Insights:** Engage with project managers, team members, and other stakeholders through surveys or interviews to gather insights into the efficacy and challenges of existing practices.

Training and Team Development

- **Skill Gap Analysis:** Identify any skill gaps within your team concerning AI and data literacy, and plan targeted training programs to bridge these gaps, enhancing your team's AI proficiency.
- **AI Literacy Programs:** Implement foundational AI literacy programs to ensure all team members comprehend AI's basics, its applicability in project management, and associated ethical considerations.

Setting SMART Goals

- **Specific Objectives:** Clearly articulate specific goals for AI integration within your project management practices, such as optimizing risk management processes, improving stakeholder communication, or refining project scheduling.

- **Measurable Outcomes:** Define tangible, measurable outcomes to gauge the success of AI integration efforts, including metrics like shortened project durations, heightened stakeholder satisfaction, or budgetary efficiencies.

Risk Assessment and Mitigation

- **AI Integration Risks:** Identify and assess potential risks related to AI integration, such as data privacy issues, resistance to change, or excessive reliance on AI recommendations.
- **Mitigation Strategies:** Develop comprehensive strategies to address these risks, incorporating robust data security protocols, change management initiatives, and ensuring continued human oversight over AI-driven decisions.

Pilot Testing and Implementation

- **Pilot Projects:** Select smaller, manageable projects as testbeds for AI tool experimentation, allowing for controlled testing and learning.
- **Feedback and Iteration:** Collect and analyze feedback from pilot projects, making necessary adjustments to refine AI integration strategies before a broader organizational rollout.

Developing an Organized Backlog and Action Plan

- **Strategy Canvas Exercise:** Engage your team in a strategy canvas exercise to systematically capture and prioritize AI adoption initiatives, translating these into actionable tasks.
- **User Stories and Work Items:** Convert prioritized initiatives into user stories or work items within your project management system, ensuring clarity and accountability for each task.

Continuous Learning and Adaptation

- **Stay Informed:** Maintain a commitment to continuous learning, staying updated on the latest AI advancements and project management trends to iteratively enhance your AI-enabled project management approach.
- **Feedback Loops:** Establish robust feedback mechanisms to gather insights and lessons from ongoing AI integration efforts, leveraging this feedback to perpetually refine and improve your approach.

By methodically developing an AI-enabled project management strategy, you ensure a thoughtful and effective integration of AI tools and methodologies, tailored to your specific project requirements and organizational context. This approach not

only boosts project efficiency and decision-making but also positions your projects for greater success in an evolving project landscape.

12.2 Creating the Implementation Roadmap

Creating an AI Adoption Roadmap is an important step for project managers looking to integrate AI into their project management practices effectively. This roadmap serves as a strategic plan, guiding the systematic implementation of AI tools and methodologies to enhance project outcomes, align with organizational goals, and leverage team capabilities.

Below we'll outline a basic step-by-step process for creating your roadmap. You can pick and choose from these steps depending on your own strategy and organizational priorities.

Step 1. Assessment of Current Capabilities and Needs

1. **Evaluate Existing Processes:** Conduct an in-depth review of your current project management processes, tools, and methodologies to identify areas where AI can add value and address existing challenges.
2. **Stakeholder Consultation:** Collaborate with project teams, stakeholders, and IT departments to understand their perspectives on AI integration, technological readiness, and specific challenges that AI could address.

Step 2. Identification of AI Opportunities

1. **Pinpoint Impact Areas:** Determine specific aspects of project management where AI could have a significant impact, such as risk identification, task scheduling, stakeholder communication, or advanced data analytics.
2. **Prioritize Opportunities:** Rank these AI integration opportunities based on their potential impact, feasibility of implementation, and alignment with your strategic goals.

Step 3. AI Tool Selection

1. **Research and Evaluation:** Investigate various AI tools and platforms that cater to the identified opportunities, assessing their compatibility with existing systems, ease of use, scalability, and cost-effectiveness. We'll provide more in-depth guidance on evaluating and selecting AI tools for the project management practice in the next section.

2. **Pilot Testing:** Consider conducting pilot tests with shortlisted AI tools in controlled environments to evaluate their practicality and effectiveness within your project management context.

Step 4. Skill Gap Analysis and Training Plan

1. **Identify Training Needs:** Analyze existing skill gaps related to AI and data literacy within your project management team and outline necessary training and development initiatives.
2. **Develop Training Programs:** Organize a structured training program, incorporating workshops, e-learning modules, and practical sessions with AI tools to enhance team proficiency.

Step 5. Implementation Strategy

1. **Phased Rollout:** Develop a phased approach for AI tool integration, starting with small-scale pilot projects or specific functions before expanding to broader applications.
2. **Define Milestones:** Set clear milestones, timelines, and criteria for success for each implementation phase, facilitating tracking and adjustments as needed.

Step 6. Change Management and Stakeholder Engagement

1. **Culture Assessment:** Evaluate the organizational culture's openness to innovation and change, particularly regarding AI adoption in project management.
2. **Identify Adoption Barriers:** Recognize potential resistance or obstacles to AI integration, such as concerns over job displacement or skepticism about AI's value.
3. **Change Management Plan:** Create a comprehensive plan to manage the transition, including communication strategies, stakeholder engagement activities, and support mechanisms to address potential resistance.
4. **Stakeholder Collaboration:** Actively involve stakeholders in the AI integration process from the outset, addressing their concerns and securing their support for the adoption roadmap.

Step 7. Monitoring, Evaluation, and Continuous Improvement

1. **Evaluation Mechanisms:** Establish continuous monitoring and evaluation processes to assess the effectiveness of AI tools, user adoption rates, and their impact on project management outcomes.
2. **Feedback Loop:** Implement a feedback system to gather insights, user experiences, and performance data, utilizing this feedback to refine the AI adoption roadmap continuously.

Practical Considerations

1. **Organizational Alignment:** Ensure the AI adoption roadmap is in harmony with the overall organizational strategy, technology infrastructure, and cultural readiness for AI integration.
2. **Risk Management:** Identify and plan for potential risks associated with AI adoption, such as data privacy issues, integration challenges, or user resistance, incorporating appropriate mitigation strategies into the roadmap.

By meticulously developing an AI adoption roadmap, project managers can navigate the complexities of integrating AI into project management, ensuring a strategic, well-coordinated approach that maximizes the benefits of AI while aligning with organizational objectives and enhancing project management practices.

Step 8. Assess Tools and Technologies

- **Tool Functionality Review:** Evaluate the functionality, user experience, and integration capabilities of the current project management tools to determine how well they meet the team's needs.
- **Technology Limitations:** Identify shortcomings or challenges with existing technologies, such as missing features or integration difficulties.
- **Analyze Team Capabilities and Skills**
- **Skillset Evaluation:** Assess the project management team's skills, focusing on project planning, execution, stakeholder communication, and tool proficiency.
- **Identify Skill Gaps:** Highlight any gaps, especially in areas related to AI, data literacy, and technological skills, that could impede the effective adoption of AI in project management.

Step 9: Review Organizational Culture and Readiness for AI

- **Culture Assessment:** Evaluate the organizational culture's openness to innovation and change, particularly regarding AI adoption in project management.
- **Identify Adoption Barriers:** Recognize potential resistance or obstacles to AI integration, such as concerns over job displacement or skepticism about AI's value.

Step 10: Compile Assessment Findings

- **Synthesize Findings:** Consolidate the insights from the assessments into a comprehensive report, highlighting strengths, weaknesses, and opportunities for AI integration.

Step 11: Develop Recommendations

- **Formulate Actionable Recommendations:** Based on the assessment findings, propose actionable steps to address gaps, improve processes, and set the stage for successful AI integration.

Step 12: Present Findings and Recommendations

- **Stakeholder Engagement:** Share the findings and recommendations with key stakeholders, illustrating the potential impact of AI integration and outlining a roadmap for addressing current challenges and moving forward.

By meticulously conducting a Current State Assessment, project managers can lay a robust foundation for AI integration, ensuring that subsequent steps are informed, strategic, and aligned with organizational objectives. This assessment not only illuminates the path towards AI adoption but also ensures that the transition is smooth, impactful, and tailored to the unique needs of the organization.

12.3 AI Tools Evaluation

Beyond the overall AI adoption assessment, a technical evaluation deserves its own section of guidance. Evaluating AI tools for project management is an important process that ensures the selected technologies align with your project needs and organizational goals, enhancing efficiency and decision-making. Here's a basic guide to conducting a AI tools evaluation:

1: Define Evaluation Criteria

1. **Functionality and Features:** Identify key features needed in the AI tool to meet your project management requirements, such as predictive analytics, risk assessment, automated scheduling, or sentiment analysis.
2. **Integration Capabilities:** Evaluate the tool's compatibility with existing project management systems and software to ensure seamless integration.
3. **Usability and User Experience:** Assess the tool's user interface, ease of use, and learning curve to ensure it's accessible to all team members, regardless of their technical expertise.
4. **Scalability:** Consider whether the tool can accommodate varying project sizes and complexities, ensuring it grows with your organizational needs.

5. **Cost and ROI:** Analyze the cost-effectiveness of the tool, weighing its price against the potential benefits, including time savings, improved accuracy in planning, and enhanced decision-making processes.

2: Research and Shortlist Potential AI Tools

1. **Market Research:** Conduct thorough market research to identify AI tools that meet your preliminary criteria. Utilize industry reports, reviews, and peer recommendations.
2. **Vendor Consultations:** Engage with vendors to gather detailed product information, request demos, and discuss your specific needs.
3. **Shortlist:** Based on your research and consultations, shortlist a manageable number of AI tools for deeper evaluation.

3. Technical Deep-Dive

1. **Architecture Review:** With your technical team, review the underlying architecture of each AI tool to understand its flexibility, robustness, and integration capabilities.
2. **Data Handling and Processing:** Examine how each tool handles data ingestion, processing, and storage, ensuring it aligns with your project data requirements and privacy standards.
3. **Customization and Extensibility:** Assess the tool's ability to be customized or extended to fit your specific project management needs.

4: Conduct Demos and Pilot Tests

1. **Schedule Demos:** Arrange demonstrations with vendors to see firsthand how each tool addresses your project management challenges.
2. **Pilot Testing:** Select a few tools for trial runs on smaller projects or parts of larger ones to assess their real-world applicability and impact on project efficiency.
3. **User Feedback:** Collect insights from team members who used the AI tools, focusing on their user experience, benefits observed, and any challenges faced.
4. **Performance Analysis:** Evaluate how well each tool performed against the set criteria and the goals of the pilot test.

5. Evaluation and Selection

1. **Performance Analysis:** Analyze the data from pilot tests, comparing each tool's performance against your evaluation criteria.
2. **Stakeholder Input:** Present findings to key stakeholders, including pilot user feedback, to gather additional insights and preferences.

3. **Final Selection:** Based on the comprehensive evaluation, select the AI tool(s) that best meet your project management needs.

6. Engineering Change Management Plan

1. **Technical Integration:** Outline the technical steps required to integrate the selected AI tool into your existing project management ecosystem, including any necessary system modifications or data migrations.
2. **Risk Mitigation:** Identify potential technical risks associated with the AI tool implementation and define mitigation strategies.
3. **Resource Allocation:** Determine the resources (both human and technical) needed for the implementation, including any external expertise or vendor support.
4. **Timeline and Milestones:** Establish a realistic timeline for the engineering change management process, setting clear milestones for tracking progress.

7. Documentation and Training

1. **Technical Documentation:** Ensure comprehensive technical documentation is available for the AI tool, including user manuals, API documentation, and troubleshooting guides.
2. **Training Programs:** Develop training programs for project management teams and technical staff to ensure they are proficient in using the new AI tool effectively.

This roadmap provides a structured approach for project managers to collaborate with technical teams in evaluating AI tools, ensuring the selected solutions are technically sound, meet project management needs, and can be successfully integrated into existing processes.

13. Emerging Trends and Their Potential Impact

The generative AI space is evolving at a breakneck pace. New products and updates come out all the time, and there is a dearth of lawsuits and legislation flying around, without a lot of clear precedents established. Project managers must prioritize how they may keep up with upcoming changes, innovations, and challenges in the field, ensuring they remain at the forefront of AI-enabled project management practices.

13.1 Continual Learning and Adaptation

- **Stay Informed:** Regularly update your knowledge on the latest AI advancements and project management trends through professional development courses, webinars, industry conferences, and publications.
- **Innovation Labs:** Establish or participate in innovation labs or think tanks within your organization or professional community to experiment with new AI technologies and methodologies in project management.

13.2 Emerging AI Technologies

- **AI and IoT Integration, machine-to-machine data, multimodal content generation, and autonomous agents:** Explore the integration of

AI with the Internet of Things (IoT) for enhanced project monitoring and control, enabling real-time data collection and analysis from project sites.
- **Advanced Analytics:** Leverage advancements in analytics and big data to gain deeper insights into project performance, stakeholder sentiments, and market trends.

13.3 Methodological Innovations

- **Hybrid Project Management Approaches:** Investigate the blending of traditional and agile project management methodologies with AI insights to create more flexible, responsive project management frameworks.
- **Decentralized Project Management:** Consider the implications of blockchain and other decentralized technologies on project management, particularly in terms of transparency, security, and stakeholder collaboration.

13.4 Ethical AI Use

- **Ethical Frameworks:** Develop and adopt ethical frameworks for AI use in project management, addressing issues such as bias, transparency, and accountability.
- **Regulatory Compliance:** Stay updated on regulations and standards governing AI use, ensuring your project management practices remain compliant and ethical.

13.5 AI in Team Dynamics and Collaboration

- **Virtual and Augmented Reality:** Utilize virtual and augmented reality technologies, combined with AI, to enhance team collaboration, especially in remote and distributed project environments.
- **AI-Powered Collaboration Tools:** Adopt AI-powered collaboration tools that facilitate more effective team interactions, decision-making, and problem-solving.

13.6 Skills for the Future

- **AI Literacy:** Emphasize the importance of AI literacy for all project team members, ensuring they understand how to interact with and leverage AI tools effectively.
- **Interdisciplinary Skills:** Encourage the development of interdisciplinary skills that blend project management expertise with data science, AI, and other technological competencies.

13.7 Preparing for Change

- **Change Management Strategies:** Develop robust change management strategies to address the workforce implications of AI, focusing on reskilling, upskilling, and adapting to new ways of working.

- **Future-Proofing Projects:** Implement practices that future-proof your projects, such as flexible project frameworks, scalable AI integrations, and adaptive risk management strategies.

By keeping abreast of emerging trends and their potential impact on project management, professionals can ensure their methodologies, tools, and skills remain relevant and effective. This forward-looking approach not only enhances project outcomes but also positions project managers and their teams as innovators and leaders in the application of AI.

Ex. 13 Practice: AI: Implementation Roadmap Canvas

miro.com/app/board/uXjVNvgYjwY=/?share_link_id=797673177801

Instructions:

For this final exercise, we will use what we just covered on evaluating and planning for AI implementation to create a basic strategy canvas you can use as a jumping-off point back at work.

Using sticky notes and working with your small group, populate each of the five categories on the Miro board with the specific action items and priorities you feel are most important for leveraging AI in your project management work. This should be a creative exercise, and is meant to capture your most immediate thoughts while everything we've covered in class is fresh in your mind. The canvas exercise is not meant to be overly rigid or structured.

If you had ideas during class that you placed in the parking lot, now might be a good time to look back at them and see if they have a place on your canvas.

The five categories are:

1. **Set SMART goals** for using AI more in your project management work.

2. **Current state assessment:** Record basic information about your current project management environment, identifying existing tools, processes, and AI readiness.

3. **AI Tools Evaluation:** Discuss and evaluate different AI tools (ChatGPT, BingChat, Bard+Gemini, others?) based on your project needs and environment.

4. **Training & Change Management:** Outline a training plan for your team to develop the necessary skills for AI adoption. List any other change management needs you can think of.

5. **Risk Assessment and Mitigation:** Identify potential risks associated with AI integration into your project management processes.

Thank you!

We hope you've enjoyed taking our class. It's an exciting time in the professional world, as both disruption and new potential surround us in equal measure.

As you've listened to the lecture portions of this class, participated in the practice, and shared thoughts with your peers, your brain should be swirling with ideas on how you can leverage generative AI in your own job. Ultimately, that brain of yours is the biggest factor in your success with AI adoption and usage.

Generative AI is a powerful technology, but at the end of the day, it's a machine and a tool, and it should be treated as such. Robots and automation have disrupted the labor force before, and they will again. Those who learn how to leverage the benefits of these technologies are the ones who stay ahead of the disruption.

We've tried to stimulate as many ideas as we can in the brief time we had together, but in some ways we've barely scratched the surface. The levels of detail, complexity, and specificity you will face in your own work can't be replicated in a

class of this length. But you can leave class with a solid baseline, an excellent understanding of how generative AI can be applied in your work, and a reliable framework for figuring out how to apply AI in your own situation. We hope we've done a good job.

Best of luck, and let us know how it goes!

Chris and the SoftEd Team

