

GUIDE

Artificial Intelligence in Model-Based Systems Engineering: **Use Cases**



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INTRODUCTION

AI is transforming Model-Based Systems Engineering (MBSE) by accelerating workflows, enhancing quality, and unlocking new capabilities across the systems engineering lifecycle. Innoslate, SPEC Innovations' full lifecycle MBSE solution, is leading this evolution by integrating advanced AI-powered features that make MBSE more accessible, efficient, and effective for engineers in every industry.

This guide details how AI enhances MBSE, Innoslate's AI capabilities, and practical use cases for applying AI in MBSE within Innoslate.

HOW AI ENHANCES MBSE

AI augments MBSE platforms by automating routine tasks, providing richer insights, and enabling scalable decision support:

- **Automated test case generation:** Saves time and improves consistency by linking tests directly to requirements.
- **Translation support:** Instantly translates documents while preserving formatting, streamlining global collaboration.
- **Risk analysis:** Identifies and documents potential risks quickly, improving safety and traceability.
- **Summarization:** Extracts key insights from large documents for faster stakeholder communication.
- **Content generation:** Produces images, text, and model components tailored to project needs.
- **Intelligent prompts:** Assist in rapid authoring of models, scenarios, and traceability analysis.



AI OFFERINGS IN INNOSLATE

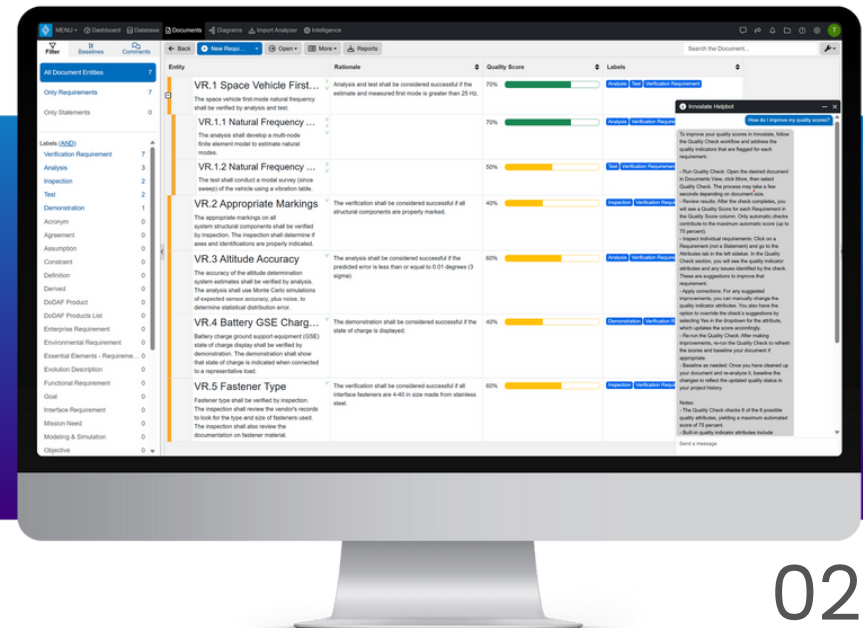
Innoslate's suite of AI-driven features provides multiple entry points for leveraging artificial intelligence within MBSE:

- **Test Case AI:** Automatically generates test cases and links them to requirements.
- **Translate AI:** Translates documents and model artifacts, preserving structure and accuracy.
- **Risk AI:** Assesses and documents project risks, embedding them in models and diagrams.
- **Summarize AI:** Extracts and embeds key insights from complex documentation.
- **Text Prompt AI:** Enables rapid content creation with templates and adjustable tone, supporting professional, technical, and other communication styles.
- **Image Generation AI:** Generates expressive, style-specific images tailored to specific project needs, enhancing clarity.
- **Requirements Quality Check:** Utilizes Natural Language Processing (NLP) to ensure that requirements are clear, complete, consistent, well-designed, traceable, and verifiable, thereby reducing ambiguity and enhancing testability.
- **Intelligence View:** Reduces risk and ensures project-wide quality by providing a high-level overview of requirement health and relationships.
- **Traceability Matrix:** Reduces errors early in the lifecycle by ensuring end-to-end traceability across requirements, design, risks, and test cases.

See Innoslate's AI capabilities firsthand.



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AI IN MBSE: USE CASES
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AI PROMPT SUGGESTIONS FOR MBSE

Below is a list of suggested AI prompts for enhancing MBSE workflows with Innoslate or any AI-augmented MBSE tool:

"Summarize this requirements document in bullet points for the system design review."

"Translate the full system specification to Spanish while maintaining all section headers."

"Identify risks in this subsystem's requirements and link them to relevant mitigation strategies."

"Generate a set of verification test cases based on this list of functional requirements."

"Draft a technical description for the communications interface using a professional tone."

"Create a model diagram representing data flow between all subsystems in this scenario."

"Explain the rationale behind this architectural decision in terms for a non-technical stakeholder."

"Suggest improvements to the physical model to optimize for power consumption."

"Generate an image depicting the proposed architecture in a modern, schematic style."

These prompts empower engineers to maximize productivity, ensure quality, and maintain best practices by harnessing the full power of AI within MBSE platforms.

INNOSLATE AI USE CASES

AI ASSISTANT

The AI Assistant, powered by ChatGPT, provides intelligent responses to support engineers inside Innoslate. It is available in two locations:

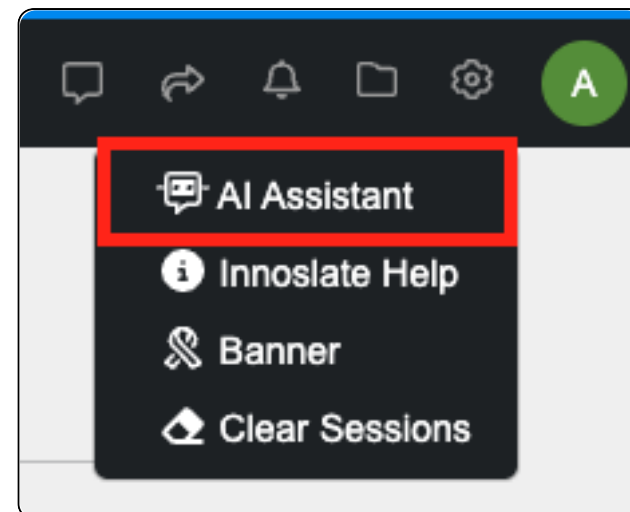
- [In Project Preferences](#)
- [In the Rich Text Editor](#)

The functionality is consistent across both, helping users with queries, brainstorming, and documentation support.

Note: It is essential to mention that although the feature appears in two different locations, its functionality remains the same. The only distinction between the two is that the Rich Text Editor AI Assistant copies the text inside the description field in the chatbot.

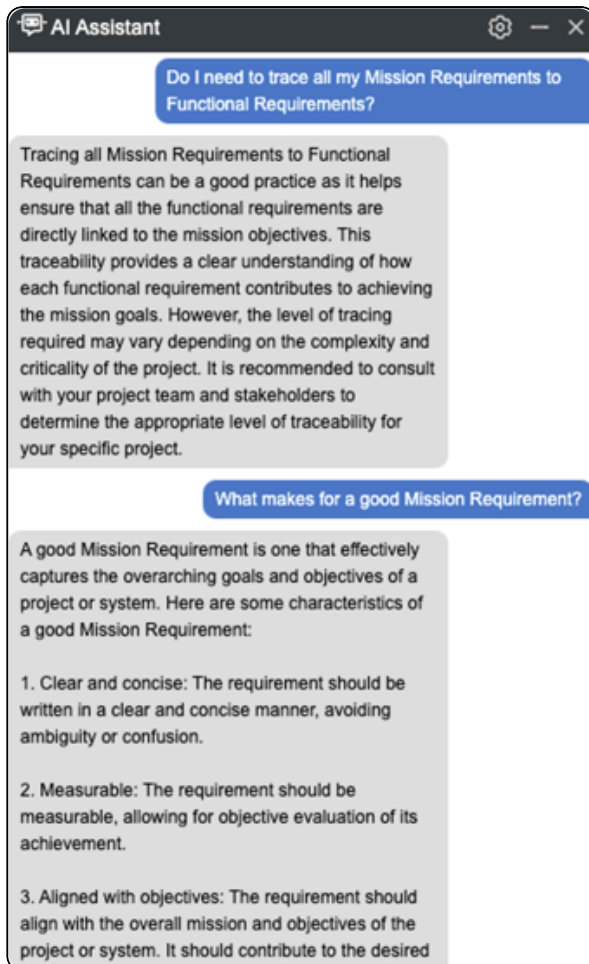
PROJECT PREFERENCES

The AI Assistant can be used to ask any question, like general systems engineering questions. Similar to ChatGPT on OpenAI, the chatbot on Innoslate is limited to the latest ChatGPT live index. The feature will be available in "Project Preferences" on any Innoslate interface.



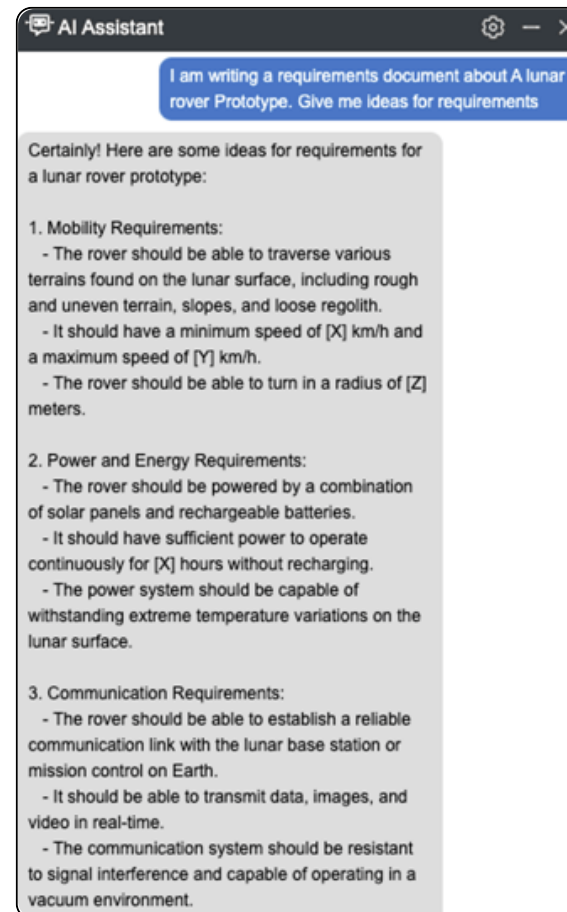
USE CASE: GENERAL INQUIRY

In the use case below, the AI Assistant responds to a question regarding Mission Requirements. As mentioned, this chatbot is proficient at general commands and can answer questions unrelated to Innoslate Help Center.



USE CASE: GENERATE IDEAS

Another use case for an AI Assistant would be to utilize the feature to get a head start on concepts and ideas that engineers want to create. In the use case below, the chatbot is used to generate ideas for potential requirements related to a Lunar Rover Prototype. This can be a helpful tool that can be leveraged during the brainstorming stages of any engineer's work.



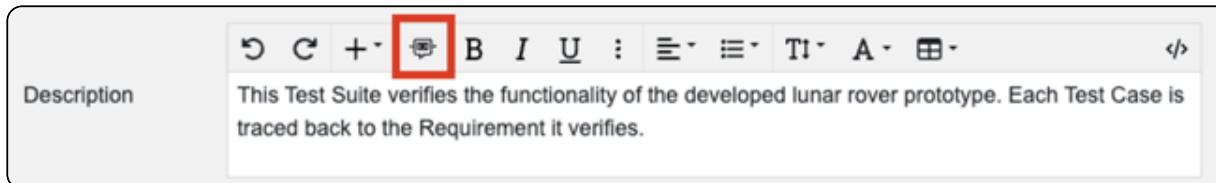
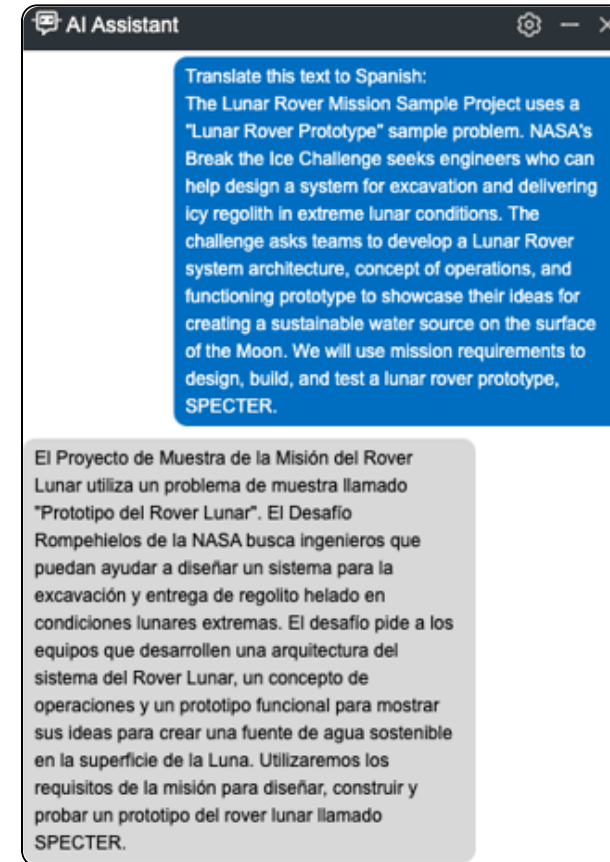
USE CASE: TRANSLATE TEXT TO OTHER LANGUAGES

The AI Assistant is capable of translating input text into many languages. This use case is particularly helpful for foreign users of Innoslate, who may benefit from language guidance when using the tool. Quick access to a translator can save time and effort by eliminating the need to navigate different platforms to use the software.

RICH TEXT EDITOR

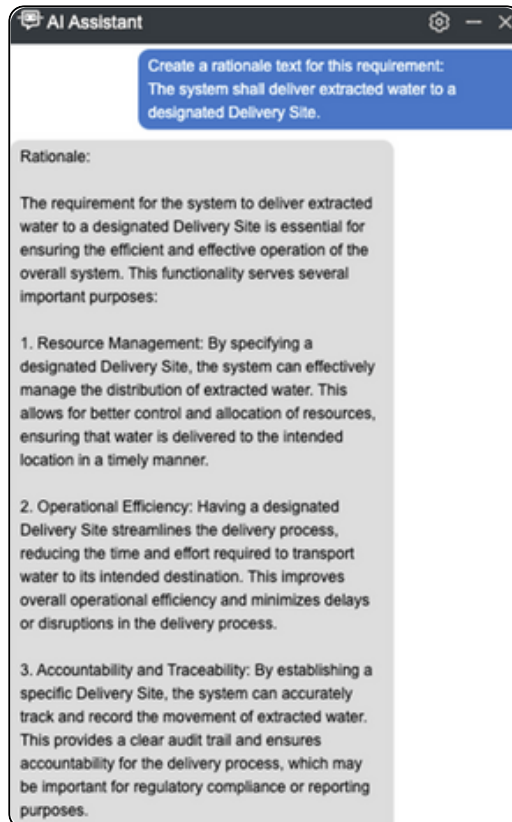
As mentioned before, the AI Assistant can be used to ask any question, like general systems engineering questions. The feature is also available in the toolbar for any Rich Text Editor on Innoslate. Rich Text Editors are commonly available entities, diagram entity description fields, etc.

You can access the AI Assistant using the chatbot button displayed in red. After clicking the button, the text inside the box will be copied exactly as is into the chatbot command box. With that, users can then use the information and create questions and commands.



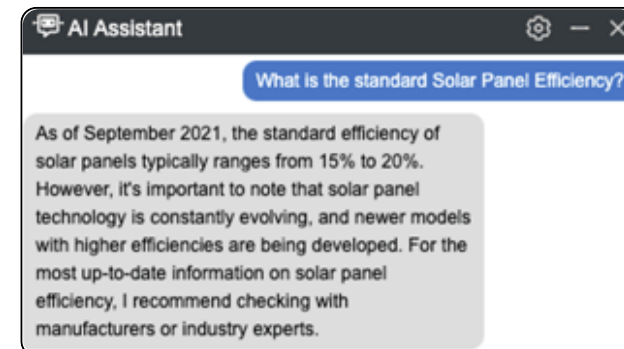
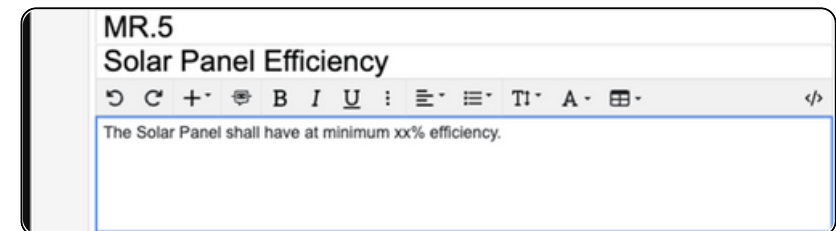
USE CASE: CREATE RATIONALE FROM REQUIREMENT

In this use case, the chatbot can create a rationale for an existing requirement on Innoslate. This feature allows for simultaneous work with an AI language that can expand on your current work on Innoslate and create more documentation.



USE CASE: LEARN ABOUT SYSTEM SPECIFICATIONS

In this use case, the user needs to learn about a certain specification to create the requirement documentation. The "xx" represents the information that the user wants to learn about. Using the chatbot, the user can learn about the information they are inquiring about and complete the requirement using the AI Assistant.

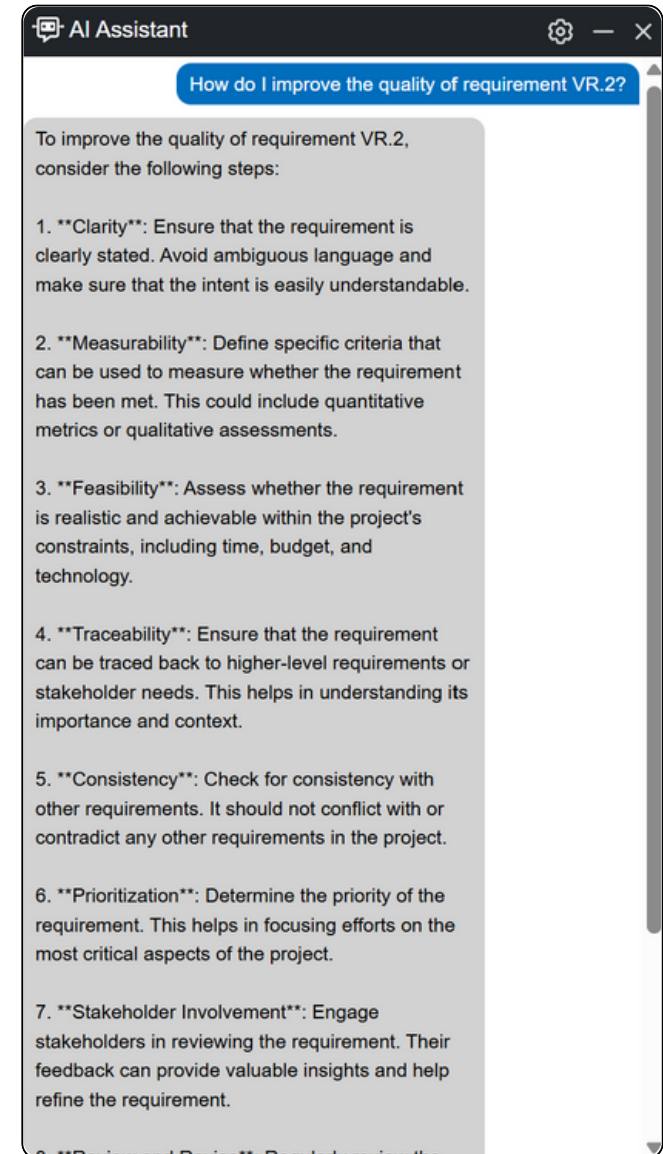
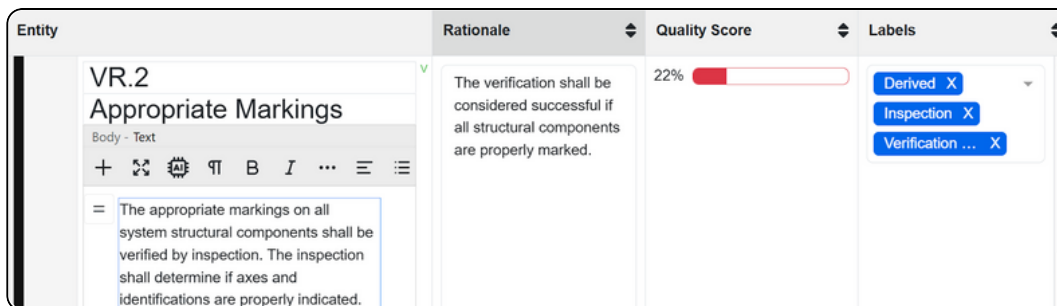


USE CASE: AUTO-CHECK REQUIREMENT QUALITY

High-quality requirements are the foundation of every successful project. Innoslate's Auto-check Requirement Quality capability leverages Natural Language Processing (NLP) to instantly assess requirements against best practice criteria: Necessary, Feasible, Appropriate, Verifiable, Unambiguous, Correct, Complete, Conforming, and Singular.

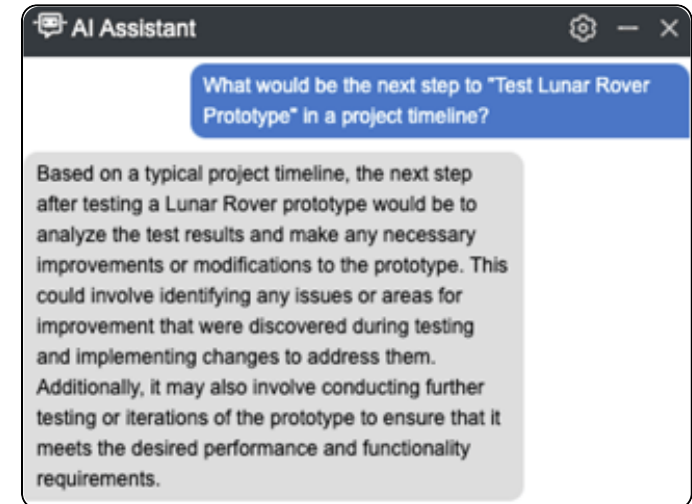
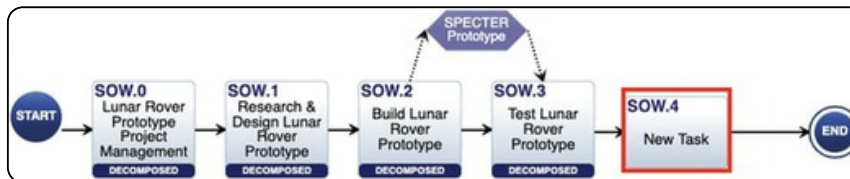
In a matter of seconds, engineers can identify poorly written requirements, such as "The system shall move fast." Instead of leaving room for ambiguity, Innoslate flags vague terms like "fast" and recommends replacing them with measurable values. For example, rewriting the requirement as "The system shall move at a minimum speed of 20 km/h" ensures clarity, traceability, and testability.

This capability ensures your requirements are not only well-written but also ready to support downstream design, implementation, and testing activities, setting the project up for success from the very beginning.



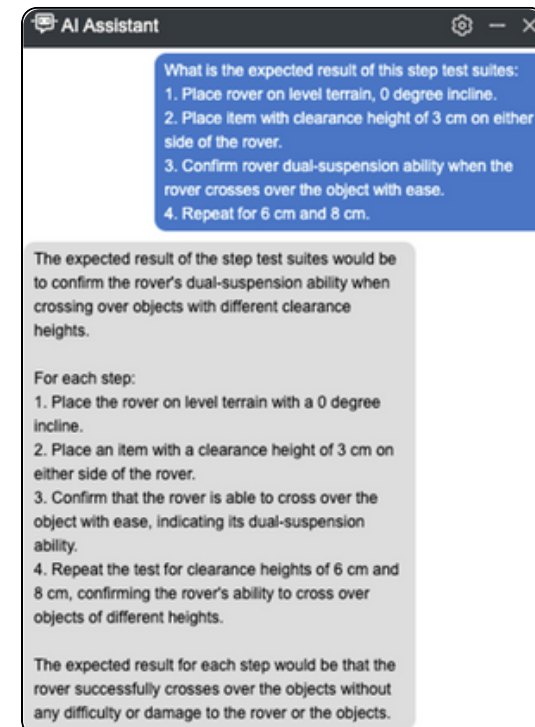
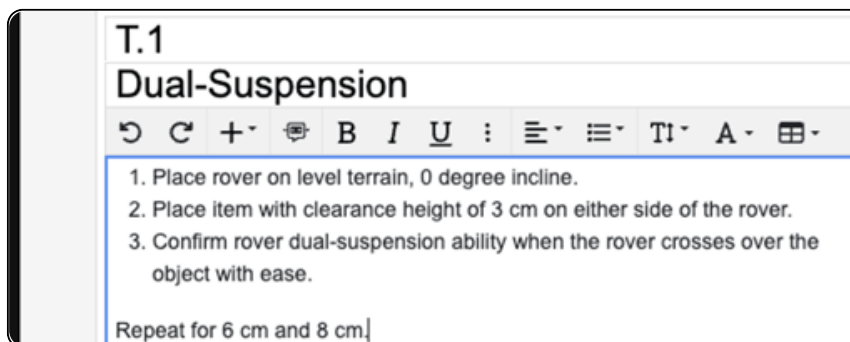
USE CASE: CREATE IDEAS FOR STEP ACTION

In this use case, the user needs to create the next step of an action diagram. The chatbot is used to create ideas for what the next step in the action diagram would be. The feature allows the user to brainstorm more ideas through the AI Assistant. In this example, the AI suggests that the next step would be to analyze and make improvements to the prototype.



USE CASE: GENERATE THE "EXPECTED RESULT"

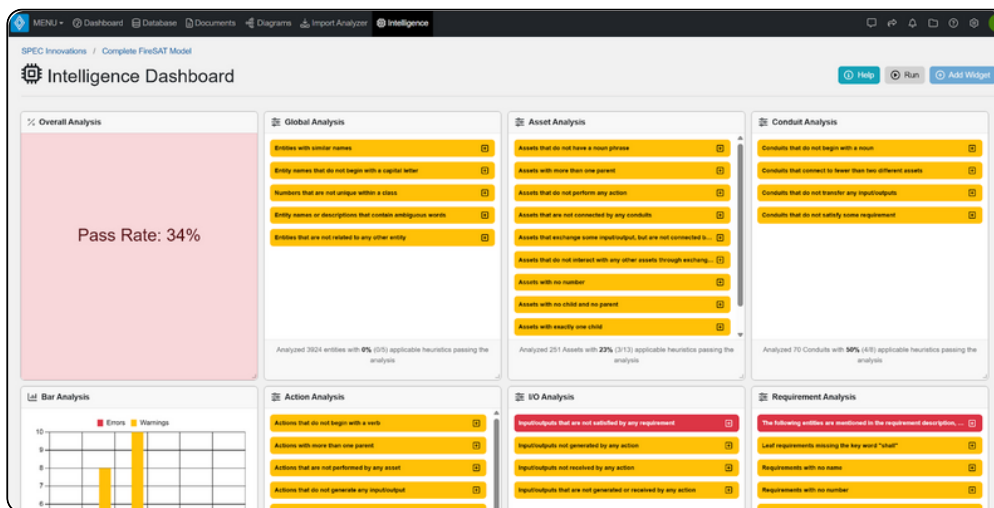
In this use case, the user aims to create an "expected result" for the test suite step procedure in the Test Center. Through using the AI Assistant, the user is able to prompt the chatbot with a command to generate the expected result of the test, based on the information that's been given to the AI.



USE CASE: FIND & FIX PROJECT-WIDE ERRORS WITH INTELLIGENCE VIEW

High-quality projects require visibility into potential issues across all requirements and relationships. Innoslate's Intelligence View gives engineers a high-level overview of project health, enabling them to quickly identify and fix errors before they spread downstream.

An engineer is preparing for a design review and needs to ensure all requirements are consistent, complete, and aligned. By opening Intelligence View, the engineer can instantly see which requirements are flagged as problematic—for example, requirements that are duplicated, contradictory, or missing critical attributes. Instead of manually scanning hundreds of requirements, the engineer quickly identifies the issues and corrects them, ensuring the project moves forward with clean, reliable requirements. This proactive approach reduces risk, saves time, and ensures quality across the entire project lifecycle.



AI Assistant

How do I improve my pass rate?

Improving your pass rate can depend on the context, such as exams, assessments, or project approvals. Here are some general strategies you can consider:

- 1. **Understand the Requirements**:** Make sure you fully understand what is required to pass. Review any guidelines, rubrics, or criteria.
- 2. **Study Effectively**:** Use active study techniques such as summarizing information, teaching concepts to others, and practicing with past exams or quizzes.
- 3. **Time Management**:** Create a study schedule that allocates time for each subject or topic, ensuring you cover all necessary material before the assessment.
- 4. **Seek Help**:** Don't hesitate to ask for help from teachers, tutors, or peers if you're struggling with certain topics.
- 5. **Practice Regularly**:** Regular practice can help reinforce your knowledge and improve your confidence. Consider doing practice tests under timed conditions.
- 6. **Stay Organized**:** Keep your study materials organized and make sure you have all the resources you need at hand.
- 7. **Take Care of Yourself**:** Ensure you're getting enough rest, eating well, and managing stress. A healthy body contributes to a sharp mind.

USE CASE: FIND MISSING TRACEABILITY

Complete traceability is essential for ensuring that every requirement, risk, and test case is accounted for. Innoslate's AI-enhanced Traceability features enable easy identification of gaps and restoration of end-to-end connections between project artifacts.

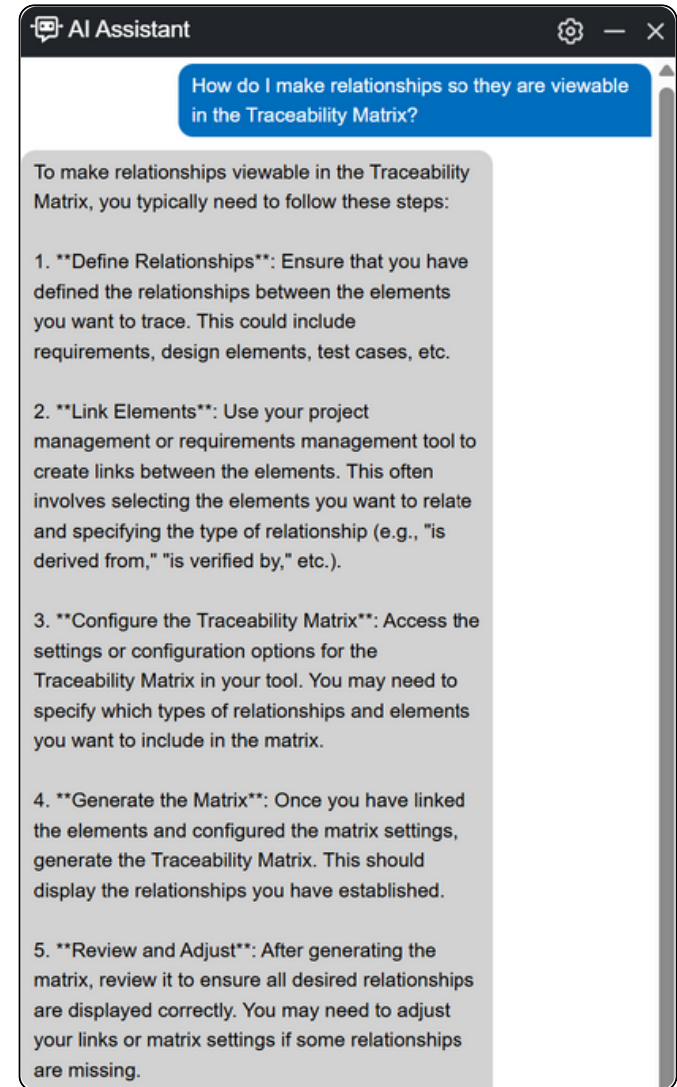
During verification planning, a systems engineer uses the Traceability Matrix to confirm that all functional requirements are linked to corresponding test cases. The AI flags several requirements that are missing test coverage. With this insight, the engineer can immediately generate new test cases or connect existing ones, closing the gaps.

By automatically detecting missing links, Innoslate helps teams maintain compliance, prevent costly oversights, and ensure that all requirements are both testable and verifiable.

INNOSLATE HELP

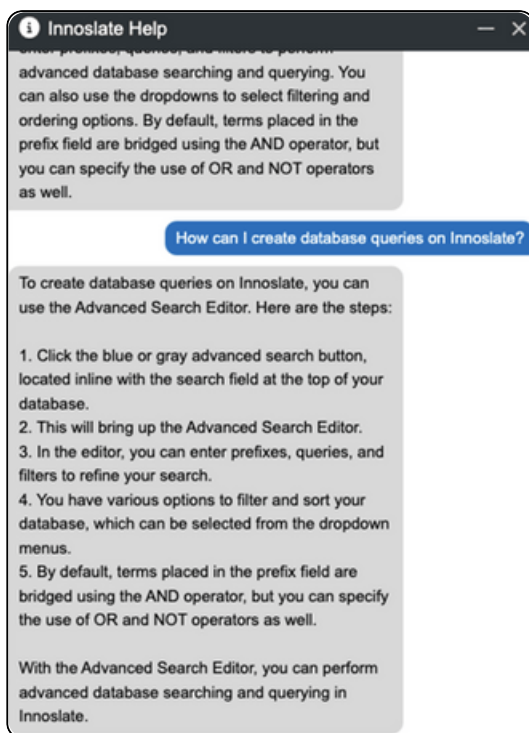
The Innoslate Help chatbot feature is a tool powered by OpenAI's ChatGPT. Designed to make your experience with the Innoslate platform smoother and more intuitive, this advanced tool offers real-time assistance, ranging from database queries to project management.

Innoslate Help can be used on all Innoslate User interfaces and aims to provide users with a personal assistant that can help guide them through the platform on any question or inquiry they have about the platform's capabilities.



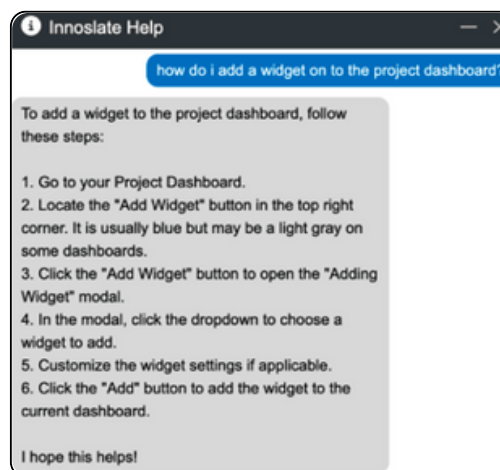
USE CASE: DATABASE QUERY

Innoslate Help's AI capabilities can assist users in conducting database queries and entity searches within Innoslate. The chatbot lists off the proper steps to create queries, as well as providing additional information on the feature.



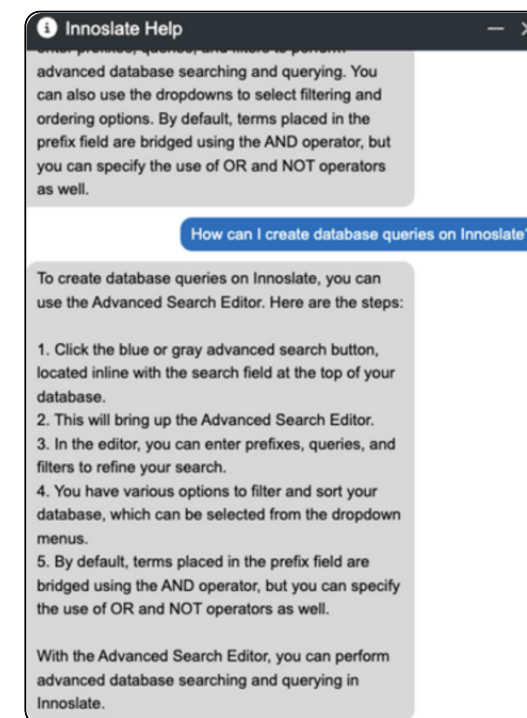
USE CASE: ADDING WIDGETS

Users can get help adding widgets to their dashboards on Innoslate. The chatbot pulls the information from the index available on Innoslate Help Center and lists off the necessary information for the user.



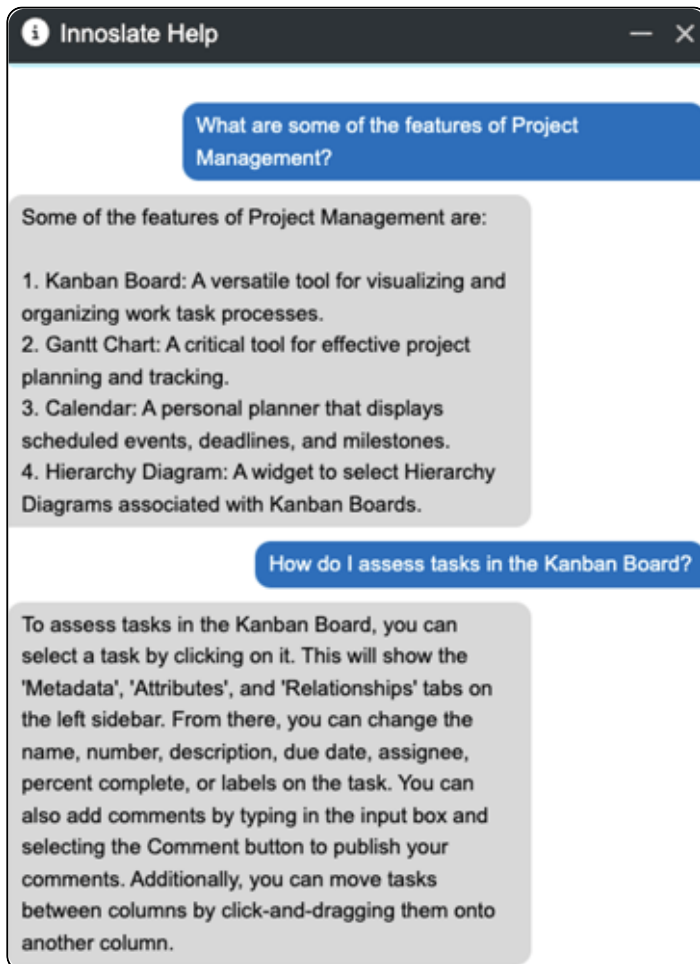
USE CASE: SIMULATORS

The chatbot can create reasoning for the differences between the two simulator options, even when the Help Center does not directly include any documentation on their differences. Additionally, we can see that the chatbot is capable of answering open-ended questions and recommending a feature to the user as they request advice.



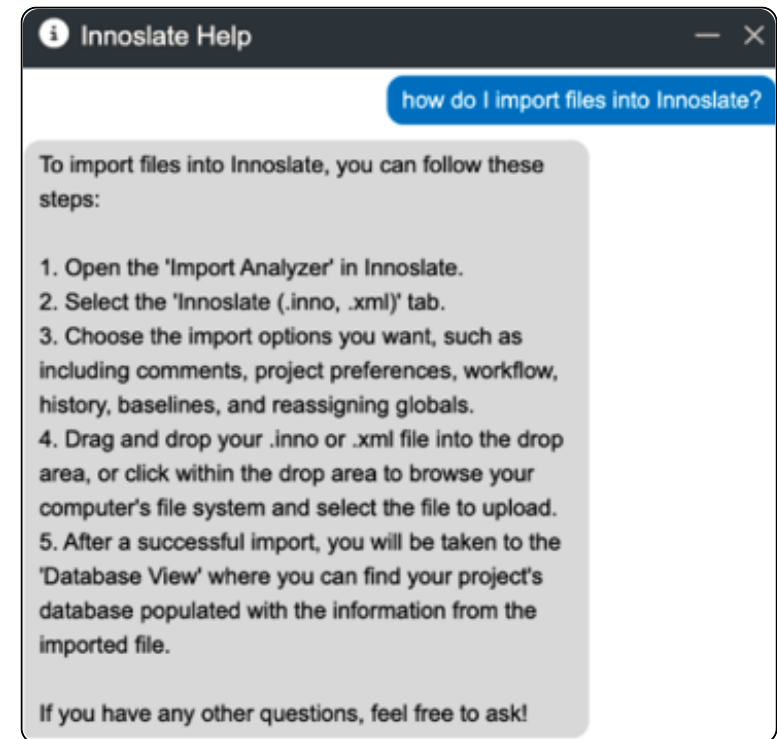
USE CASE: PROJECT MANAGEMENT

The chatbot is capable of listing all the features available in a section, providing a brief explanation of their use and purpose within the platform. Additionally, the feature can explain in detail how users can assess tasks in the Kanban Board, providing insight into one of the many features available in Project Management.



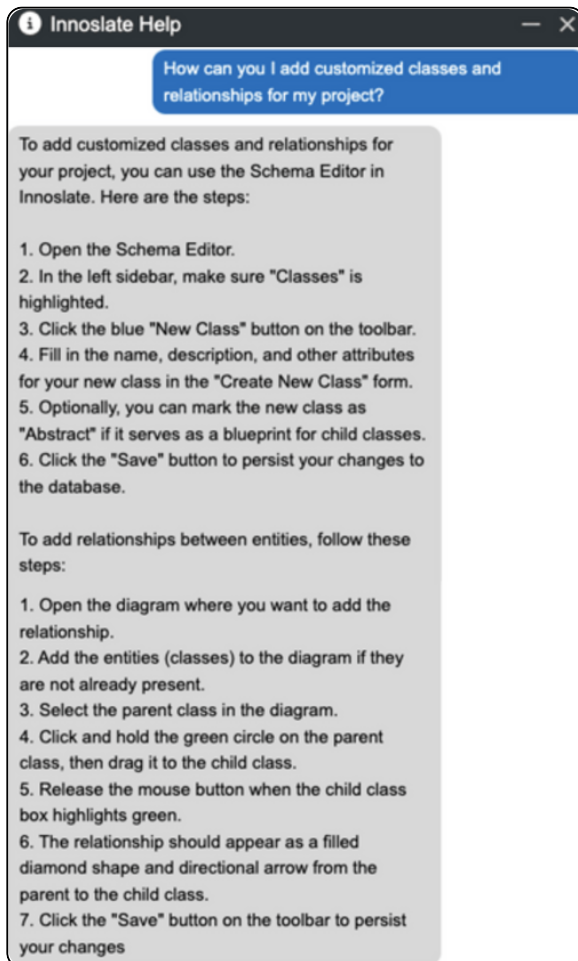
USE CASE: IMPORT ANALYZER

The chatbot can provide a step-by-step procedure for importing various types of file types on the platform. The feature can recognize the different steps required to fulfill each task, adding to the significance of the feature and its capability to go beyond to guide the user.



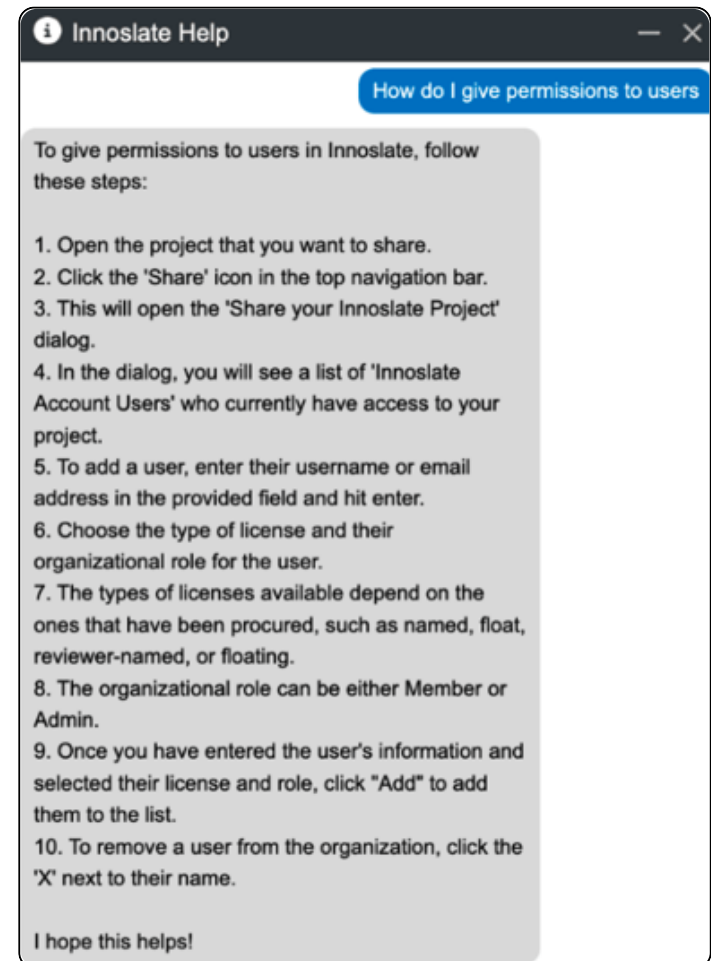
USE CASE: SCHEMA EDITOR

The chatbot responds to the user prompt at great length, especially as the user commands for two different concepts. As a result, the chatbot is able to separate the two requests and provide an in-depth, step-by-step process for each question. The AI's recognition of different question types enables the user to have the optimal learning experience.



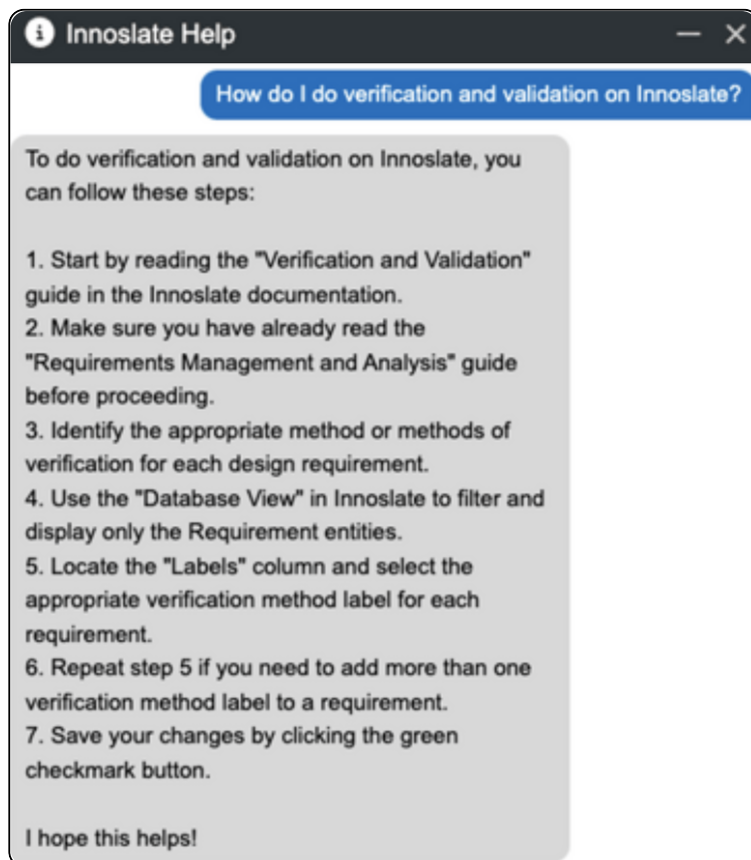
USE CASE: WORKFLOW/PERMISSIONS

The chatbot is capable of explaining the details on how permissions work and how users are able to delegate permissions to other users. The steps are detailed, and follow the exact flow of the procedure on Innoslate's user interfaces.



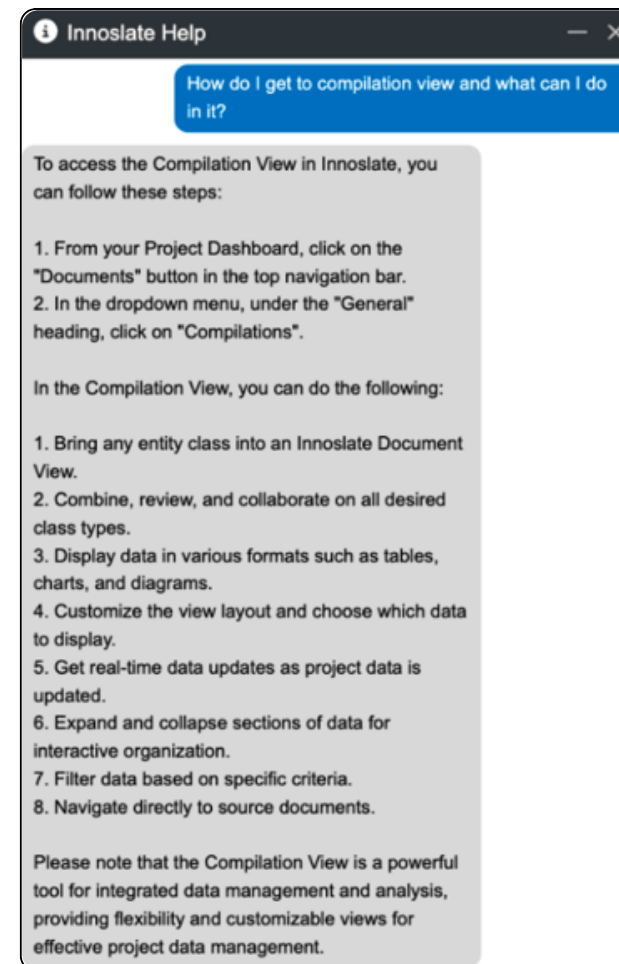
USE CASE: VERIFICATION & VALIDATION

V&V is a general concept that does not have a specific section dedicated to it on Innoslate. Considering that, the chatbot still manages to create a step-by-step guideline to how any user can do verification and validation on Innoslate. The procedure includes various features and different sections that can be used on Innoslate, providing a comprehensive answer to the user.



USE CASE: COMPILATION VIEW

For users unfamiliar with certain dashboards and concepts on Innoslate, the chatbot is capable of creating reasoning for "why" and "what" about Compilation View, enabling its core to communicate the significance of a feature on Innoslate, further creating value for the user on the platform.



CONCLUSION

By embedding AI throughout the MBSE lifecycle, Innoslate empowers engineers to streamline workflows, maintain high-quality requirements, ensure complete traceability, and reduce project risk. Through real-world use cases, this guide demonstrates how AI transforms MBSE from a labor-intensive process into a more efficient, collaborative, and intelligent engineering practice.



Ready to take your projects to the next level?

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TALK WITH AN EXPERT