draw.io

The role of AI in visualization

AI diagramming with draw.io's Generate tool

Contents

p.3 Visualizing in an AI world

p.4 Meet the draw.io Generate tool (Sparkle button ✨)

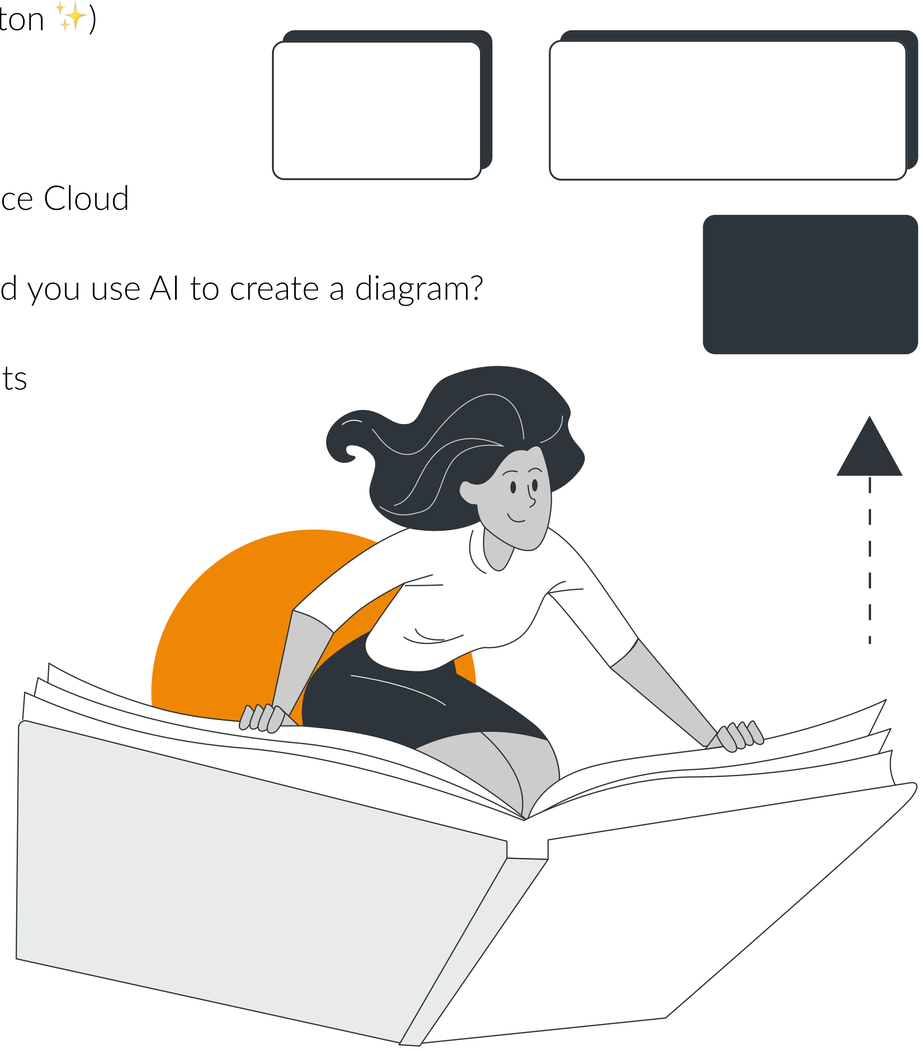
p.5 How your diagram is built

p.6 draw.io and AI diagramming in Confluence Cloud

p.7 To generate, or not to generate: When should you use AI to create a diagram?

p.10 Prompt engineering: 5 tips for better outputs

p.13 The future of AI-powered diagramming



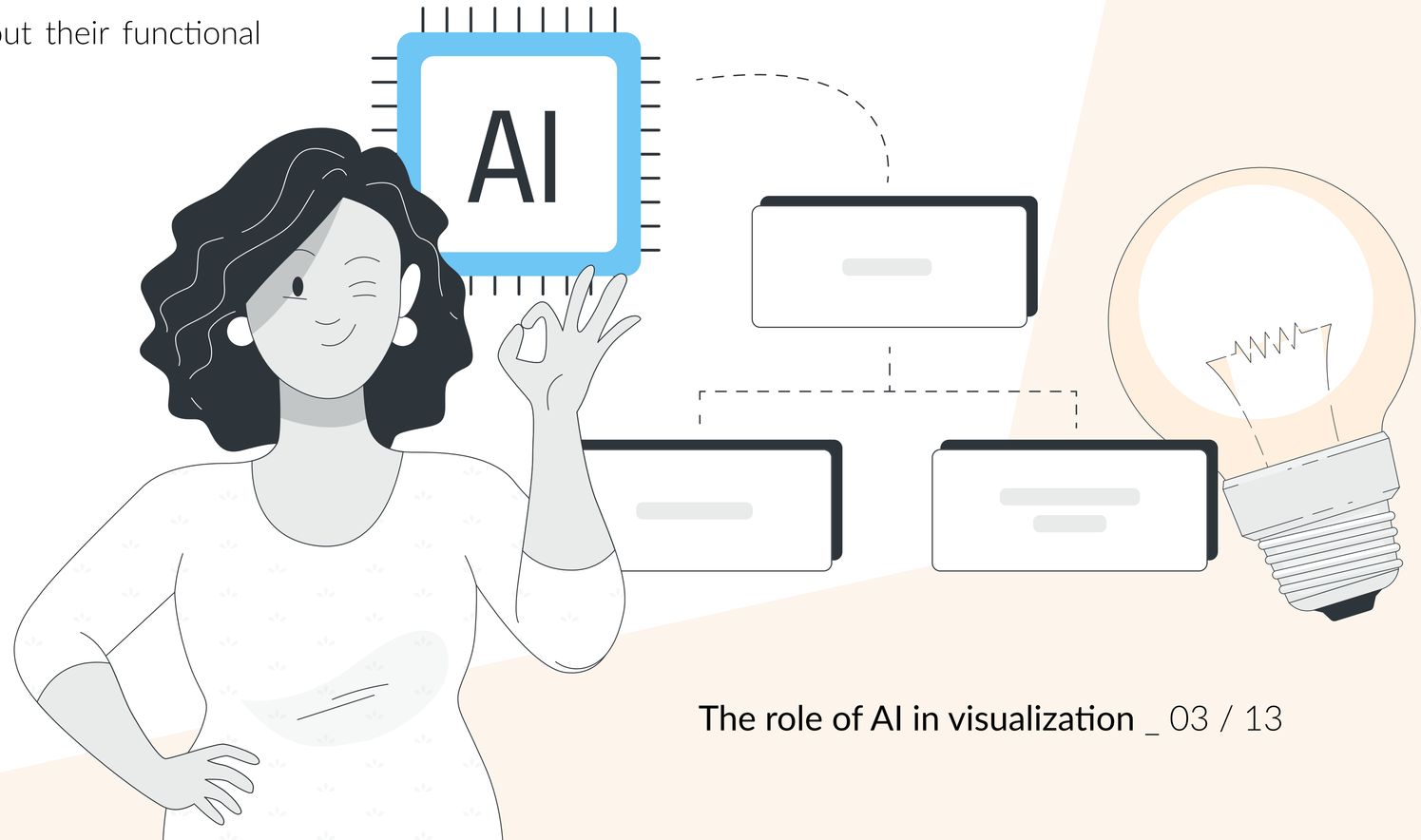
Visualizing in an AI world

You'd be hard-pressed to find someone in tech who hasn't written an AI prompt. Data analysis, summarizing meeting notes, planning a personalized trip… What started as prompt → response is becoming increasingly sophisticated. AI is enabling users to build cross-platform automations and execute API calls for example, something that was exclusively limited to developers in the past.

In the realm of visualization, AI is a powerful tool and gold mine for communicating complex ideas. For the general user, it provides a means to rapidly generate everything from conceptual mind maps to multi-step business flowcharts. For technical specialists like AWS architects, it reduces manual effort by interpreting a system description to automatically lay out infrastructure nodes and map out their functional dependencies.

Whatever the use case, kicking off a visual concept is easier than ever. With AI laying much of the groundwork, less time is spent manually searching for shapes and aligning connectors, and more time is freed up for critical thinking and refining ideas.

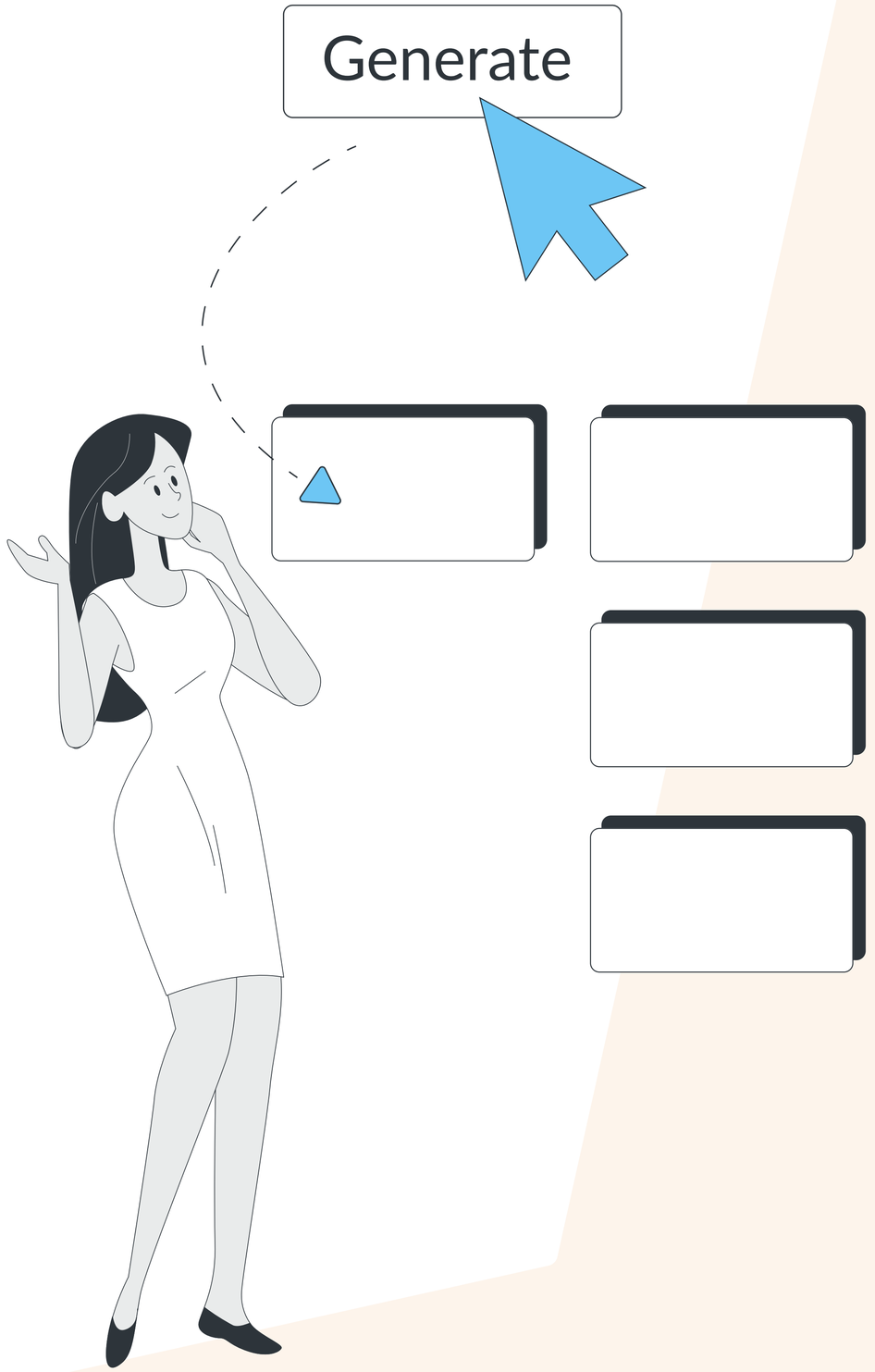
In this whitepaper, we'll explore how to leverage the draw.io Generate tool, identify the best scenarios for AI-assisted diagramming, and share practical tips for writing queries to get the most out of the feature.



Meet the draw.io Generate tool (Sparkle button ✨)

What began as Smart Templates has evolved into the **Generate** tool, a.k.a. Sparkle button. You can now create a wide range of diagrams like interface mock-ups, infrastructure diagrams, and Mermaid diagrams, directly from the toolbar. Depending on your prompt, the Generate tool intelligently selects from multiple AI generators to determine the best engine for your specific diagram type, with the tool defaulting to the Claude (Anthropic) model family.

The real strength of draw.io is its flexibility. You aren't locked into what the AI builds; you can generate a diagram with AI, build one from scratch, or mix both methods. For instance, after the Generate tool provides the initial layout, you can **replace shapes** quickly via drag-and-drop, and add in your own custom shapes afterwards.

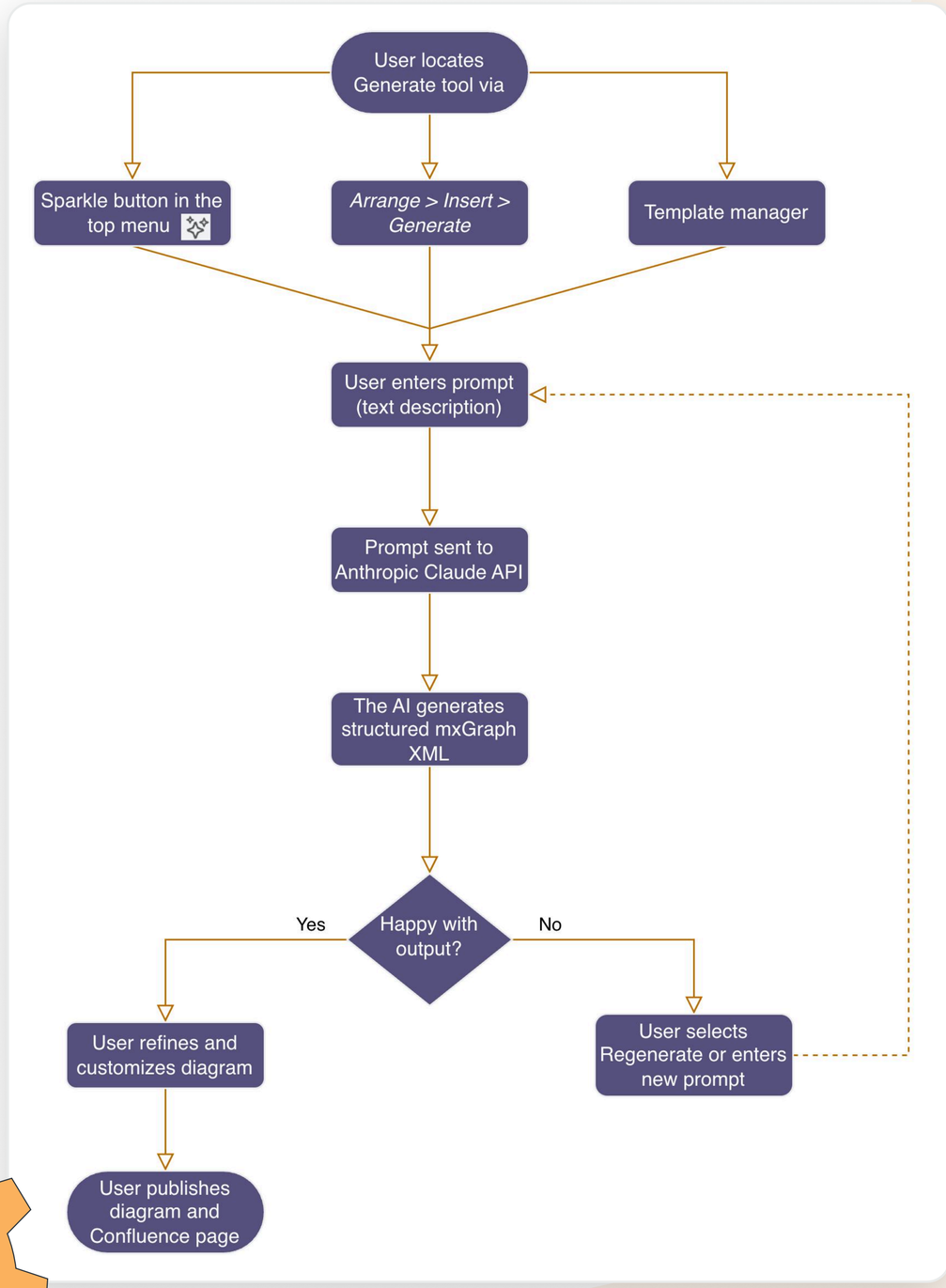


How your diagram is built

The tool chooses the shape format depending on what you are trying to achieve:

- **Native draw.io XML:** Typically used for spatial layouts like UI mockups and standard flowcharts. The tool generates structured mxGraph XML, which draw.io then renders as native shapes. Every element is a fully independent, editable object, allowing you to modify colors, fonts, and positioning using the standard format panel.

- **Mermaid Code:** For logic-heavy diagrams like Gantt charts and Entity Relationship (ER) diagrams, the tool often outputs Mermaid code. This ensures the diagram maintains a strict, predictable structure, while remaining editable via the **Mermaid text box** (select the generated shape and press **Enter** to view and modify the code).



draw.io and AI diagramming in Confluence Cloud

While the Generate tool is also available in the standalone version of draw.io, using draw.io specifically within Confluence Cloud offers distinct advantages for professional teams:

Data security: Your data is contractually excluded from being used for AI training purposes. We use the Anthropic API under their commercial terms, which explicitly prohibit using API inputs or outputs for model training.

Security and single source of truth (SSOT): Because draw.io is integrated into your Atlassian suite, your AI-generated diagrams are created and stored directly within your Confluence pages. This avoids diagrams being scattered across various third-party accounts or personal cloud drives.

Team-wide access: Once an AI diagram is inserted into a Confluence page, it's immediately available for your teammates to view, comment on, or edit. This makes it much easier to move from a private brainstorm to a shared, collaborative visualization.

Revision and version history: Every diagram published is tracked at both the diagram and Confluence page level. You can track changes and revert to previous versions using Confluence's Version history, or draw.io's built-in Revision History.

Global search: Text within your AI-generated diagrams is automatically indexed by the Confluence search engine. This means text in diagram shapes is also searchable, making them easier for you and your teammates to find.

Note: The AI feature is **disabled** by default, and can only be enabled by an Admin **using JSON code** in the draw.io configuration settings.

For more information, see our related blogpost, ***The next evolution of AI in draw.io: Meet the Generate tool***

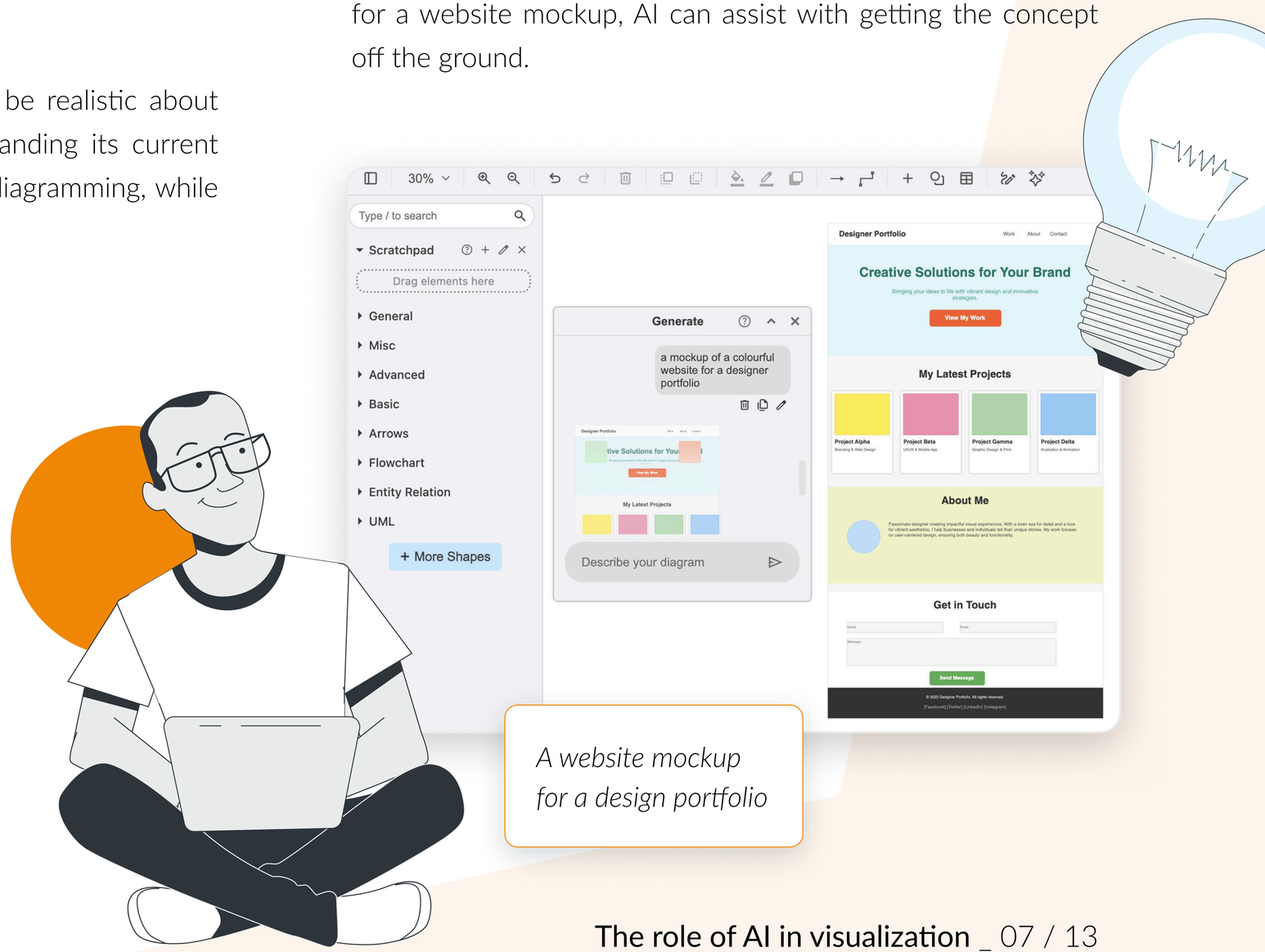
To generate, or not to generate: When should you use AI to create a diagram?

AI has opened doors for teams to achieve some truly awesome things, from automating tedious tasks to reducing the time it takes to visualize complex systems. It empowers us to move faster and think bigger than ever before.

As we test out these new capabilities, it's helpful to be realistic about where they shine. AI is no silver bullet, and understanding its current boundaries is the best way to get the most out of AI diagramming, while avoiding disappointment and time wasted.

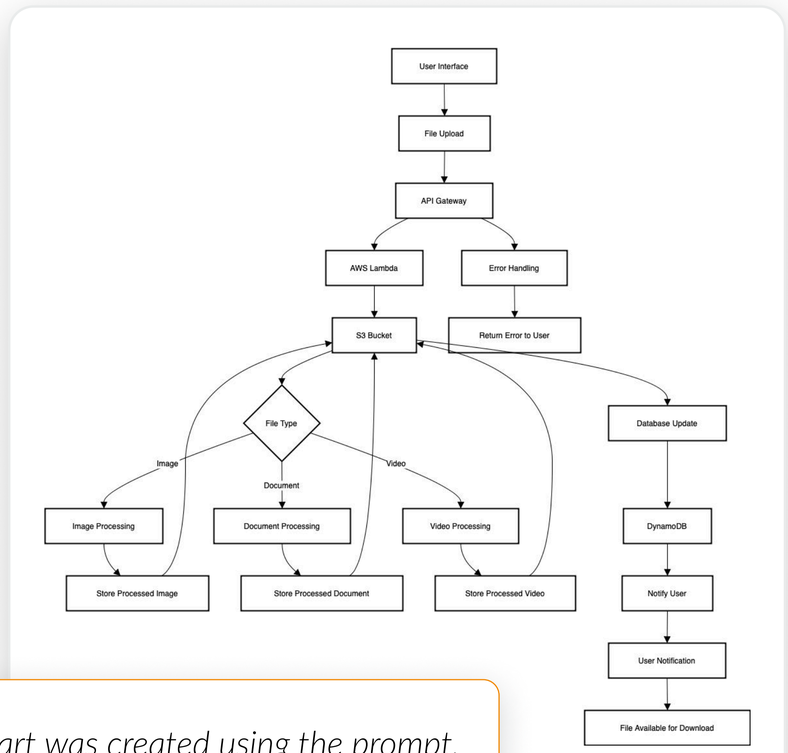
When AI diagrams can help

Ideation: When you're stumped for ideas or want inspiration for a website mockup, AI can assist with getting the concept off the ground.



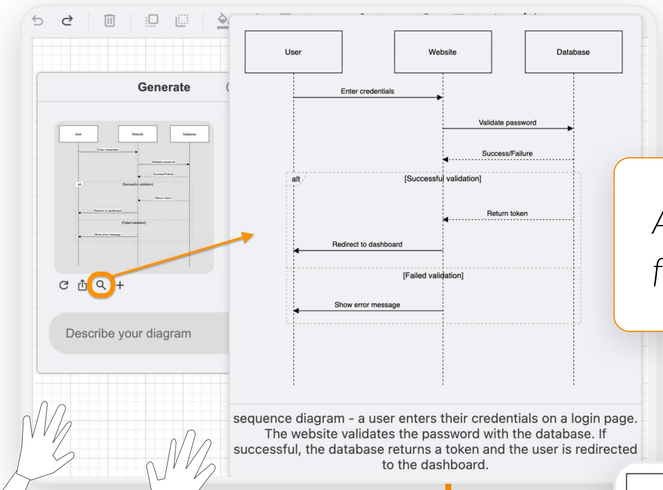
A website mockup for a design portfolio

Brainstorming: If you need to outline a generic system or process, AI can put together a basic structure in seconds. Even if the output isn't exactly how you intended, it provides a starting point for you to style and refine.

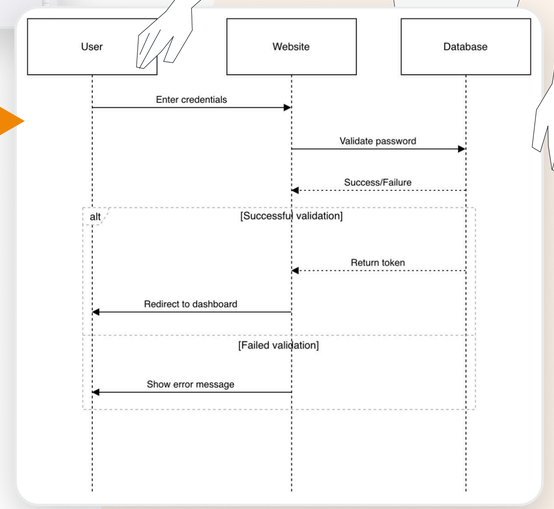


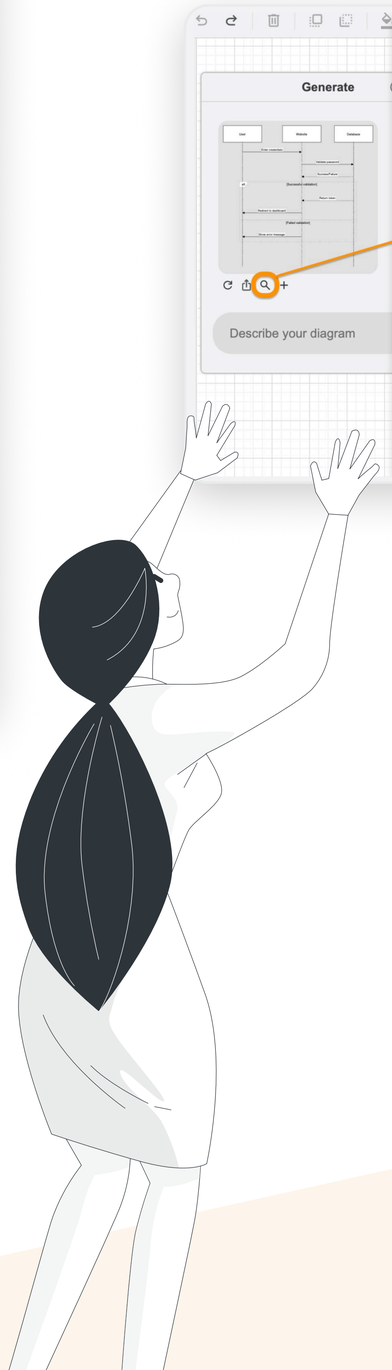
This flowchart was created using the prompt, "browser-based file storage system using a serverless AWS pattern"

UML sequence and state diagrams: these technical diagrams lend themselves well to AI generation. They follow predictable rules and appear frequently in training data, so generators can produce reliable, generic versions of these structures very quickly.



A sequence diagram for a user login flow





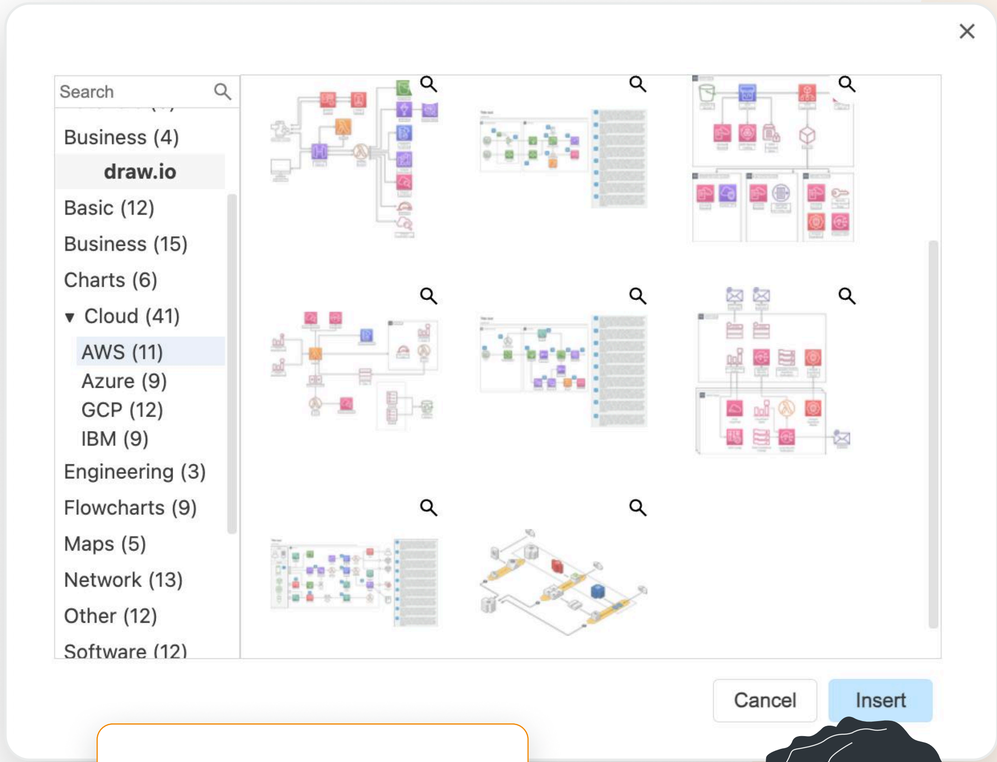
When it's better to diagram manually

Following a standard notation: If your work requires strict adherence to technical standards like AWS, BPMN, process flows, C4 models, and network diagrams, it's often easier to work directly with the relevant shape libraries in draw.io. We have dedicated shape libraries for BPMN 2.0, UML 2.5, AWS 2024, Citrix, and more.

When visualizing existing processes: The Generate tool doesn't know your company's specific internal processes or existing code. Creating the diagram manually using existing information will structure it exactly how you want with the correct contents.

Matching your corporate style: The Generate tool does not know your specific corporate font, colors, or logo. For diagrams that need to look "on-brand," it's better to use draw.io's configuration settings to pull in your team's specific styles and custom shapes manually.

> **Tip:** Even when manually creating diagrams, draw.io has many customizable standard templates that can help get the ball rolling or simply serve as inspiration. These are great for things like org charts, swimlane diagrams, business frameworks, etc.



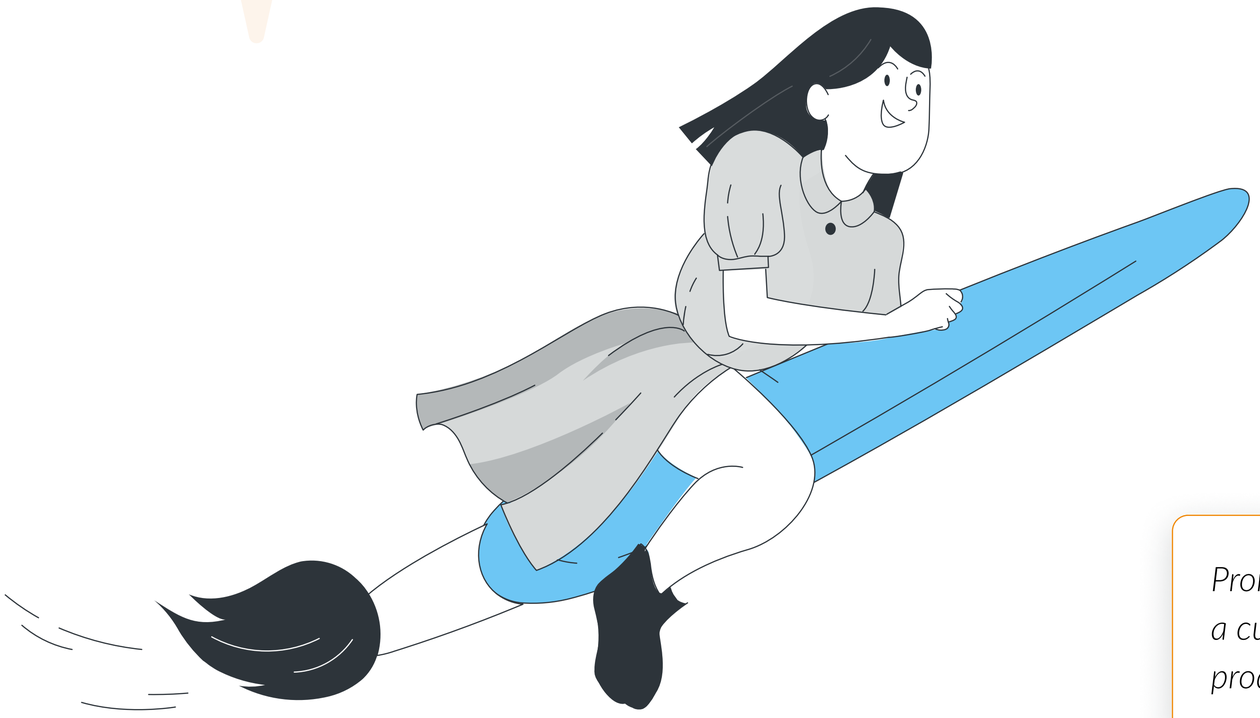
AWS templates in draw.io



Prompt engineering:
5 tips for better outputs

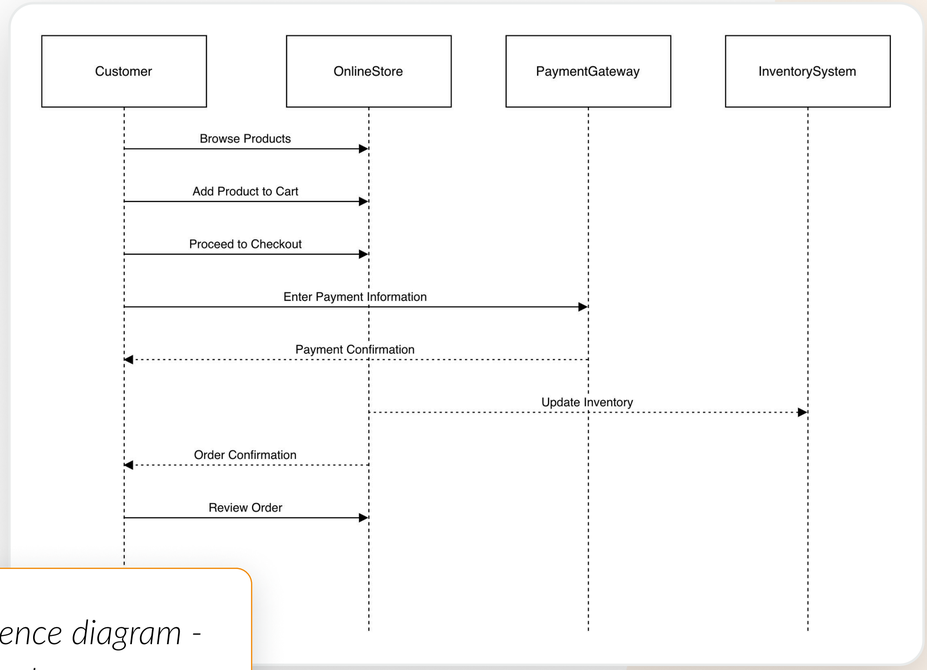
Query writing, or prompt engineering, is an essential skill as AI tools become a regular part of our day-to-day work. While the Generate tool does much of the heavy lifting, the quality of your prompt largely determines the output.

Here are five practical tips to help you get the best results from the Sparkle button:



1. Start with the diagram type

Start by stating the diagram type (e.g., "flowchart," "sequence diagram," or "mind map"). This helps the tool narrow down the best layout and shape library to use. You can even specify the orientation by adding "vertical" or "horizontal" to your request.



Prompt: "sequence diagram - a customer purchases a product from an online store"

2. Use clear, consistent language

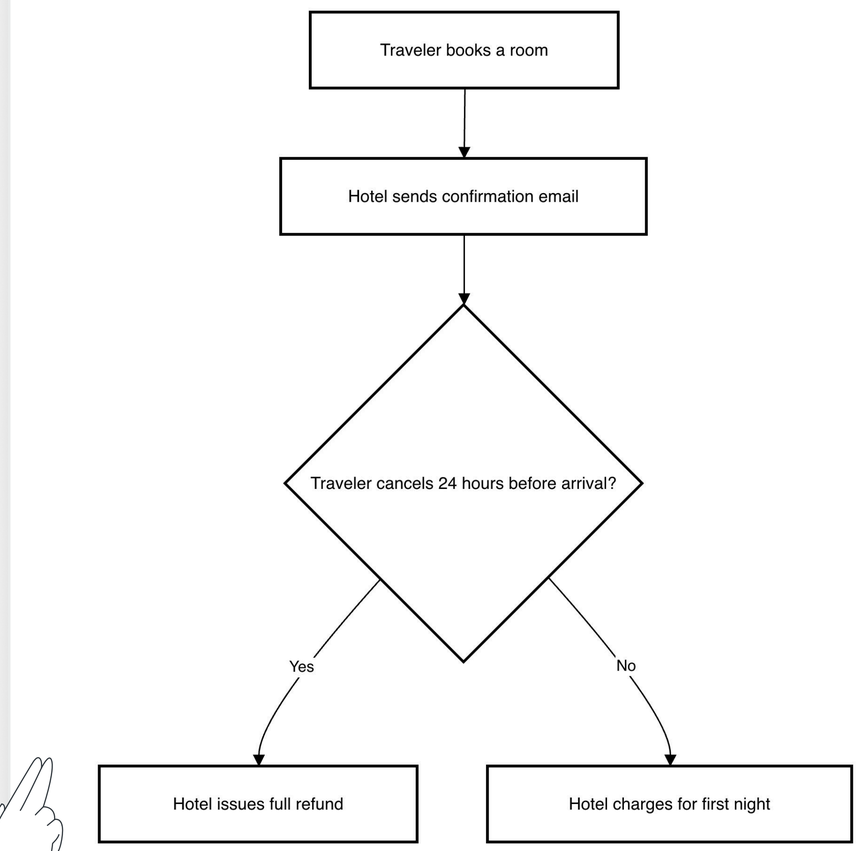
Use direct sentences and consistent names for people or systems. If you call a user "The Customer" in the first sentence, don't switch to "The Client" in the next. Staying consistent helps the AI understand that you're talking about the same entity throughout the process.

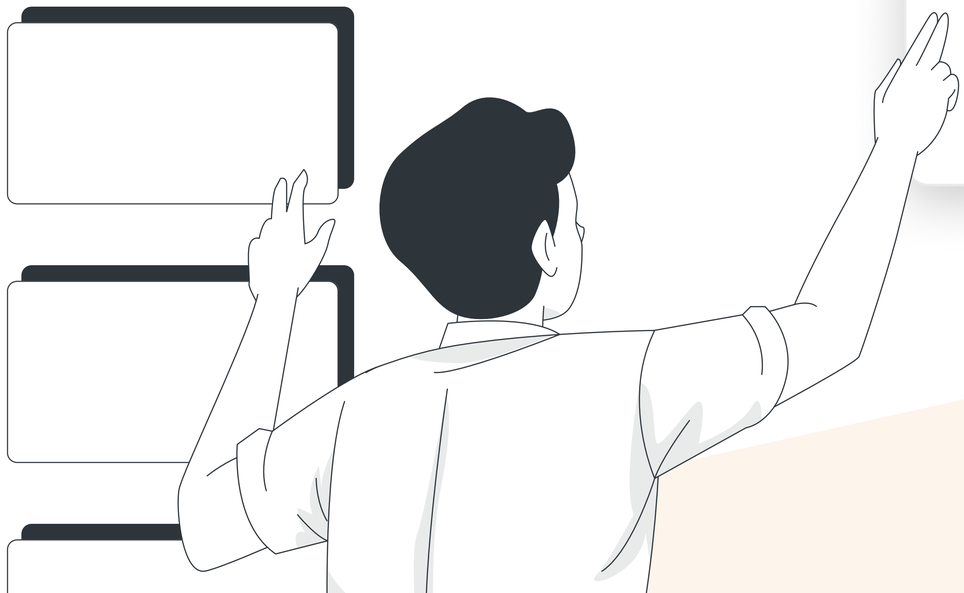
3. Provide the right amount of detail

To get a more accurate diagram that requires less manual editing later, include the "rules" of your process. Mention specific steps, decision points (like "If yes" or "If no"), and final outcomes.

- **Instead of:** "A trial software process."
- **Try:** "Flowchart - A customer signs up for a trial. After 10 days, a salesperson calls. If the customer buys, they stay active. If not, the license expires."

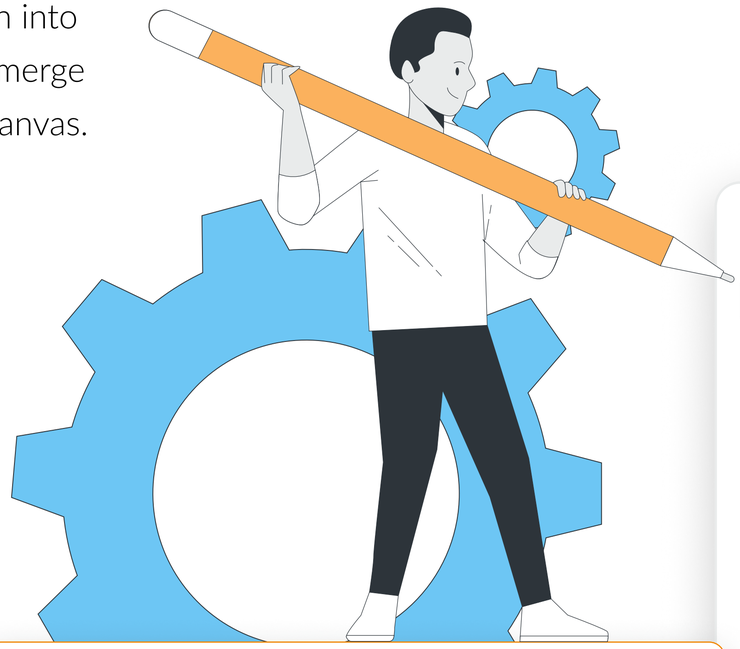
Prompt: "Flowchart - A traveler books a room through the hotel. The hotel sends a confirmation email to the traveler. If the traveler cancels 24 hours before arrival, the hotel issues a full refund. If the traveler does not cancel, the hotel charges the traveler for the first night."





4. Break queries up into smaller pieces

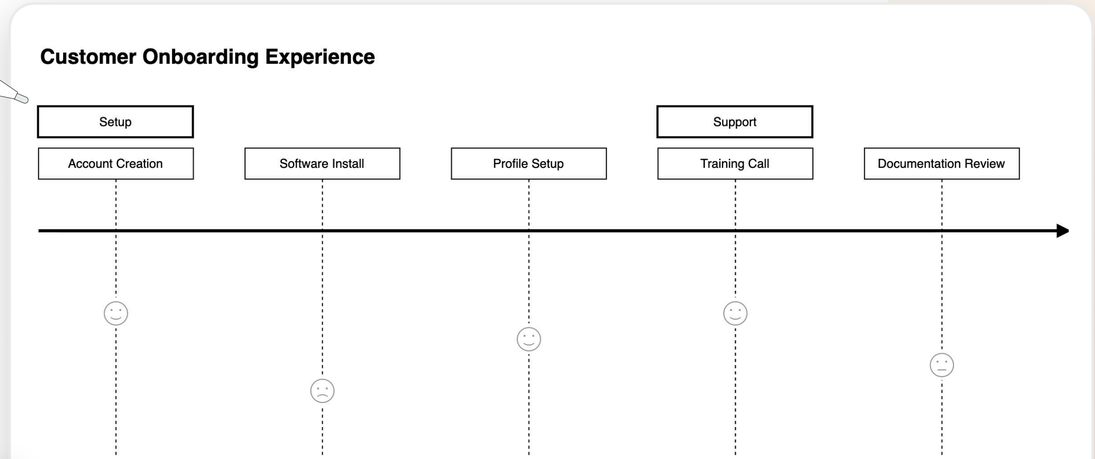
The generator can only accept short queries. If your process is highly detailed, it is often more effective to generate the diagram in sections. Break your description into smaller prompts, then link and merge the resulting diagrams on the canvas.



Prompt: "journey diagram - title Customer Onboarding Experience - section Setup: Account Creation: 5, Software Install: 2, Profile Setup: 4. section Support: Training Call: 5, Documentation: 3."

5. Use Mermaid terminology

Since the generator often uses Mermaid code for logic-heavy charts, using terms from Mermaid syntax can lead to even better results. For example, when creating a user journey, using words like "sections," "tasks," and "values" helps the AI structure the data.



For more information, see, ***How to write better queries for smart generated diagrams***

The future of AI-powered diagramming

The evolution from static templates to dynamic AI generation marks a fundamental shift in how we visualize and communicate ideas. As we have explored in this whitepaper, the draw.io Generate tool is the next step in AI visualization, using multiple AI generators to support a wider range of diagram types, from technical UML to creative brainstorming, enabling you to produce customized diagrams according to your specific parameters.

Diagramming with draw.io for Confluence and Jira offers teams far more than just a smart generator. By integrating draw.io and using its Generate tool directly into your Atlassian suite, you benefit from:

- Enterprise-level security and a Single Source of Truth, where diagrams are securely stored within the documentation they relate to.
- Your team can collaborate with confidence, knowing that every visualization, whether AI-generated or created manually, is protected by granular permission controls.
- Versioning and revision history is accessible for every diagram, allowing your team to track edits and revert changes where necessary.
- Because every shape and label is indexed, your diagrams remain discoverable through global search.

So, what's next?

Locate the Sparkle button in the top menu, give the Generate tool a try, and see what you can create. If you don't see the tool in your draw.io app for Confluence or Jira Cloud, reach out to your Administrator to see if it can be enabled in the draw.io app configuration settings.

Happy Diagramming!



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