

Dynamic Context Injection in LLMs: a case study on workflow modeling

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European Commission – Joint Research Centre

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What can you do?

As a GeoAI Agent, I can help you with various data analytics and processing tasks, primarily focusing on geospatial data. Here are some of my key capabilities:

- **Geocoding:** Convert addresses or place names into geographic coordinates and detailed location information.
- **Satellite Imagery Search:** Search for satellite imagery within a STAC (SpatioTemporal Asset Catalog) based on criteria like location, time range, and specific collections. I can also help you filter the fields you want to include or exclude in the search results for efficient data retrieval.
- **STAC Catalog Exploration:** List available collections in the STAC catalog and get detailed information about specific collections and individual items (satellite images).
- **OpenEO Integration:** I can interact with OpenEO backends for advanced geospatial processing. This includes:
 - Listing capabilities, collections, and available processes.
 - Creating, managing, and executing batch jobs for complex processing tasks (e.g., NDVI calculation).
 - Authenticating with the OpenEO backend.
 - Downloading job results.
 - Synchronous processing for smaller, quicker operations.
 - Validating process graphs before submission.
- **Google Search Grounding:** I can use Google Search to get additional information if needed.
- **Web Content Retrieval:** Fetch content from a given URL.

Essentially, I can help you find, understand, process, and analyze geospatial data.

What kind of task are you looking to accomplish today?

Analyse vegetation health around Ispra in the past 2 weeks?

What is the best available dataset to asses vegetation health around Ispra over the past |

European Commission

Joint Research Centre - T.4

http://localhost:3000

Demo Orchestrator Agent

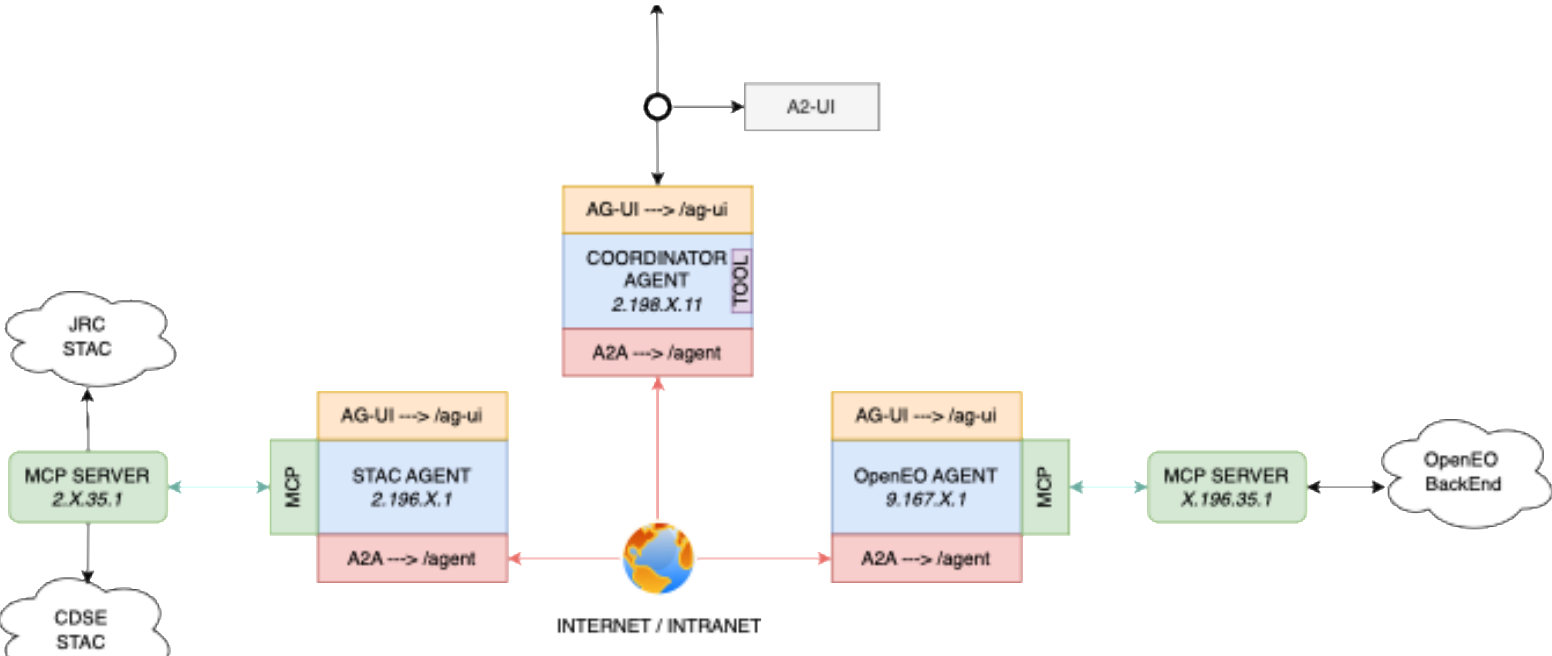
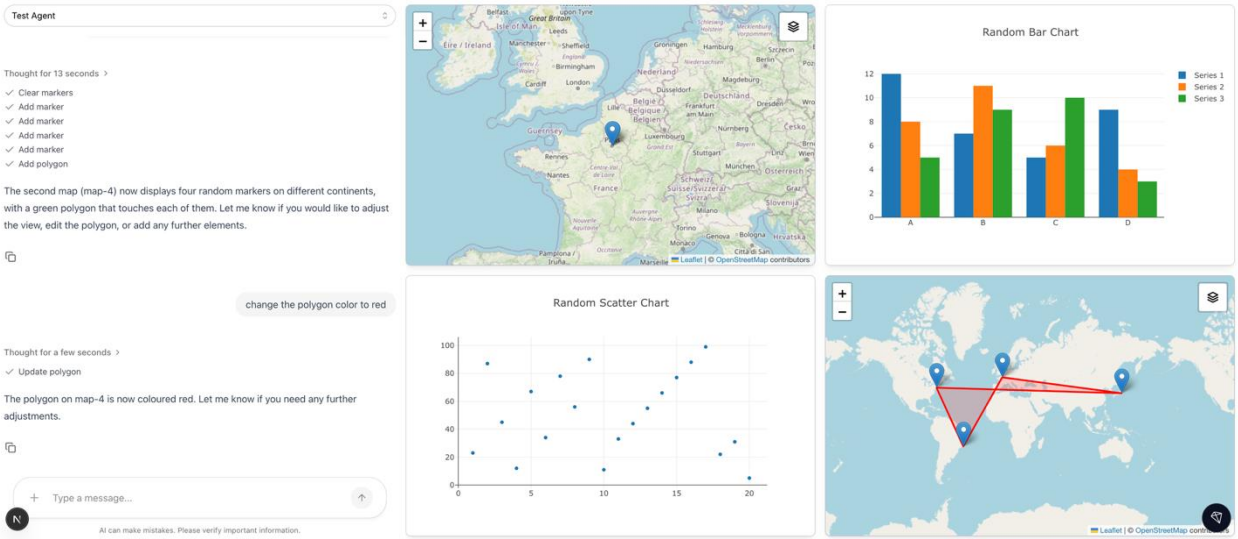
How can I help you today?

+ Show me the latest clear-sky image over Milan in spring 2023

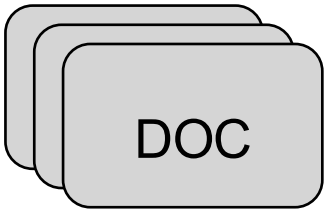
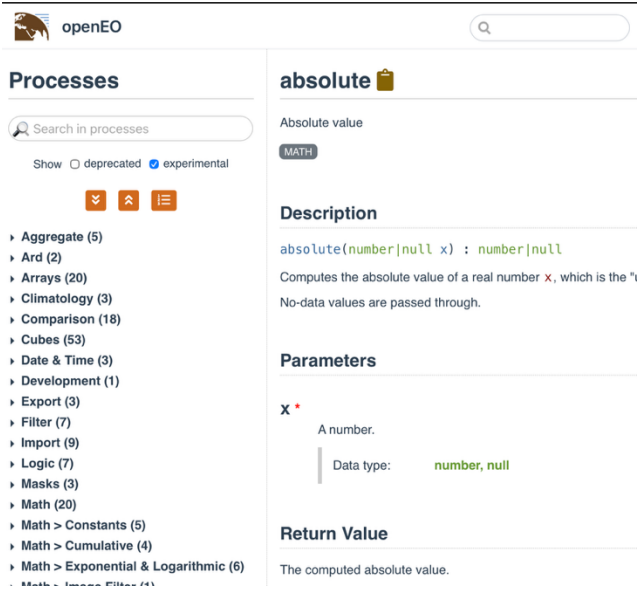
AI can make mistakes. Please verify important information.

Issue

Architecture

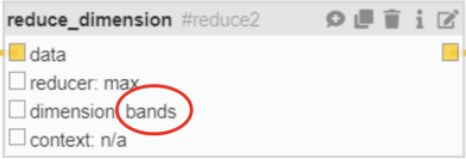


Workflow Modelling: OpenEO Agent



USER
PROMPT

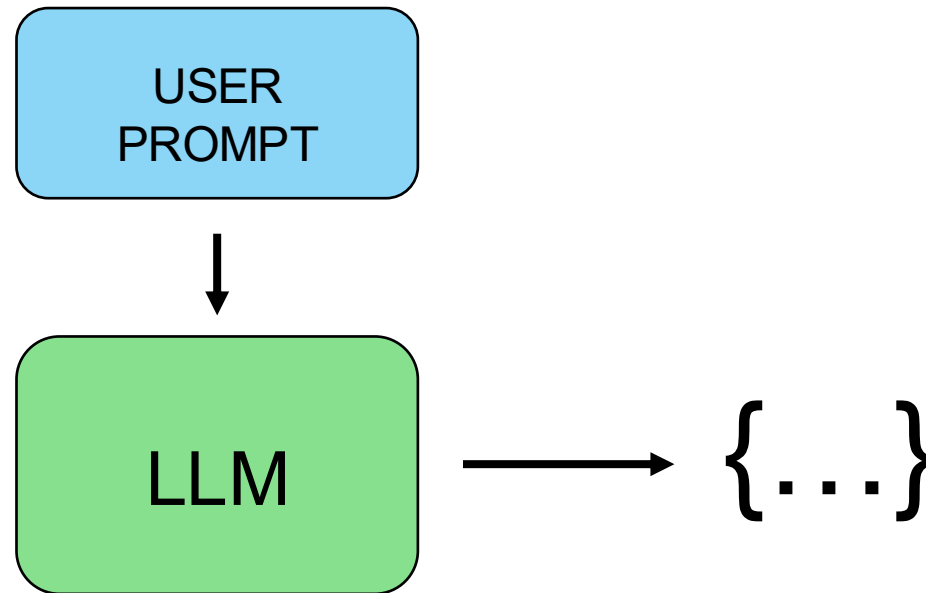
LLM



{ ... }

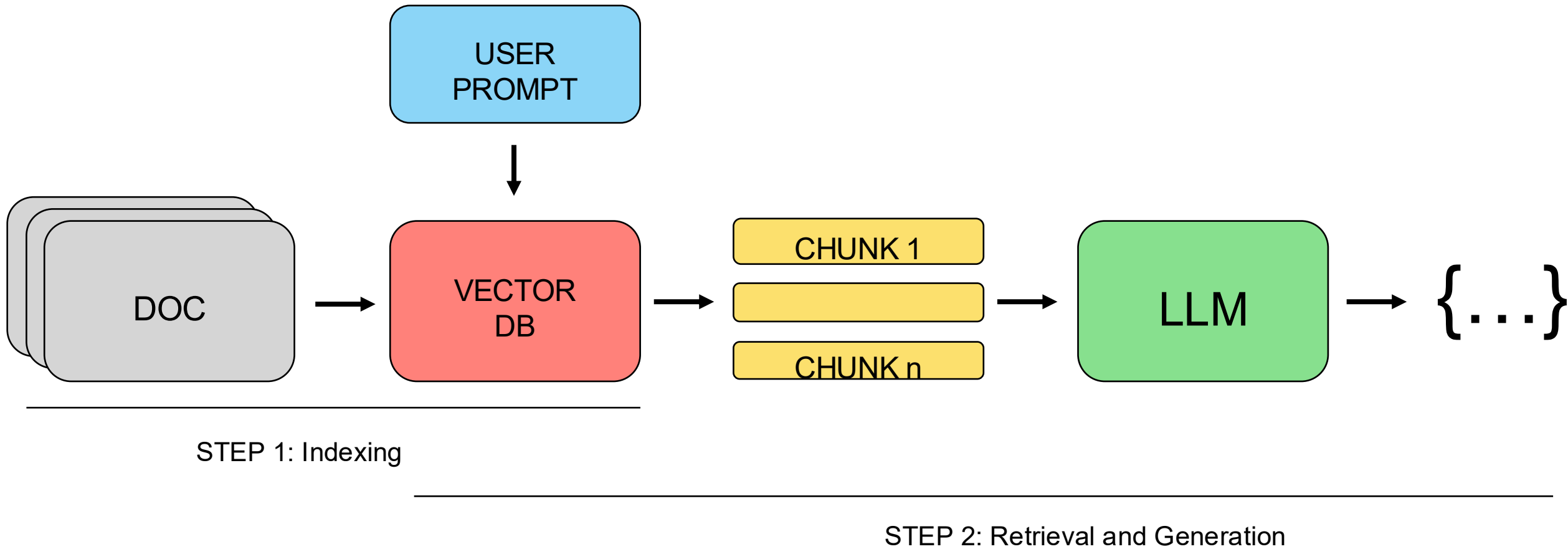


Option 1 – LLM



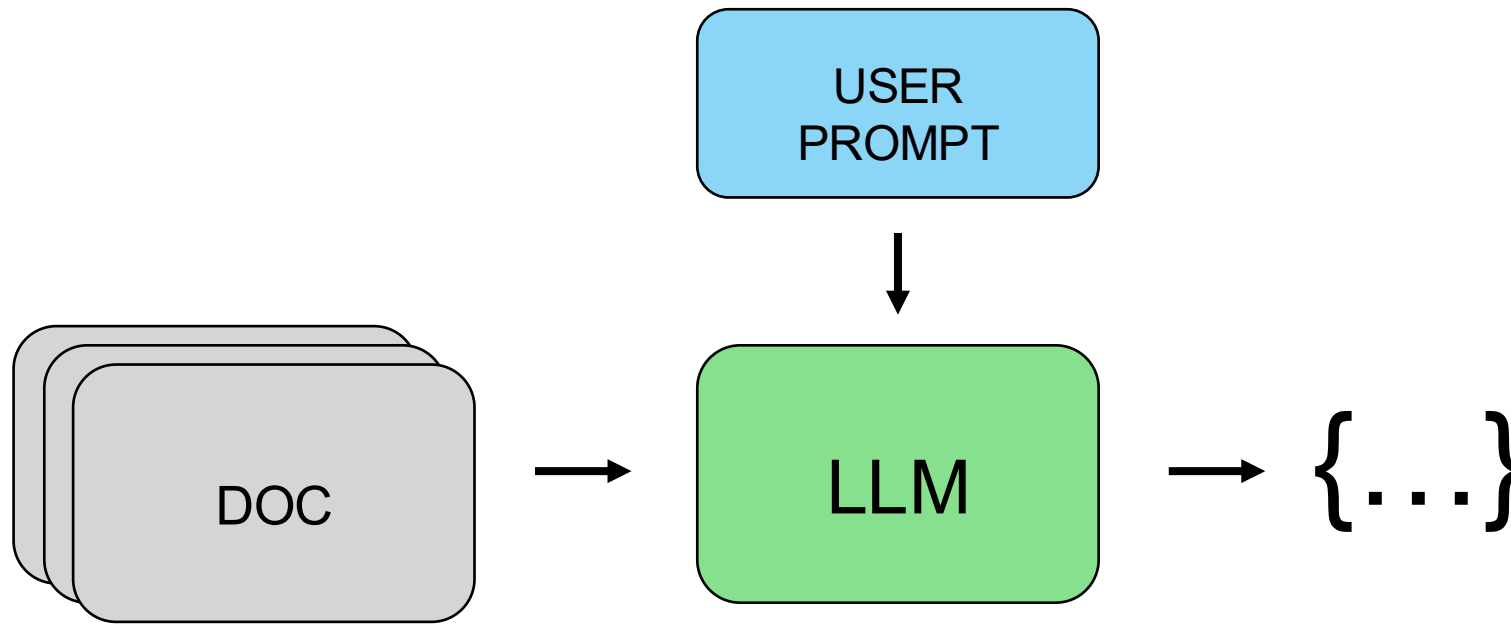
Lack of specificity, hallucinations

Option 2 - (Simple) RAG



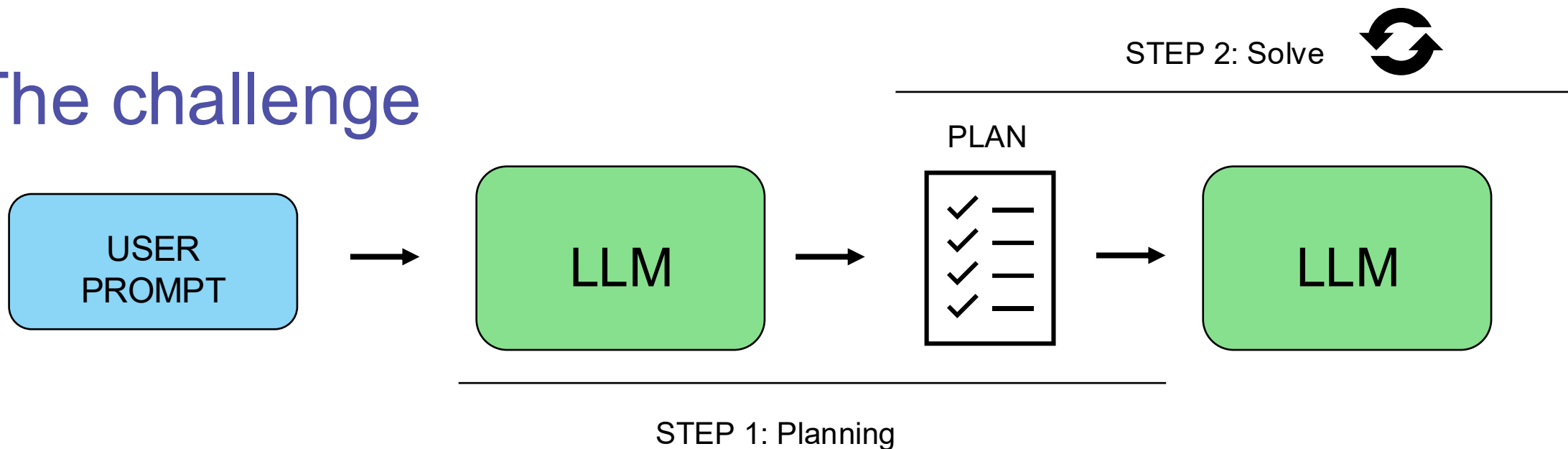
Cannot be leveraged for planning

Option 3 - Context



Catastrophic forgetting, inefficient, lack of focus

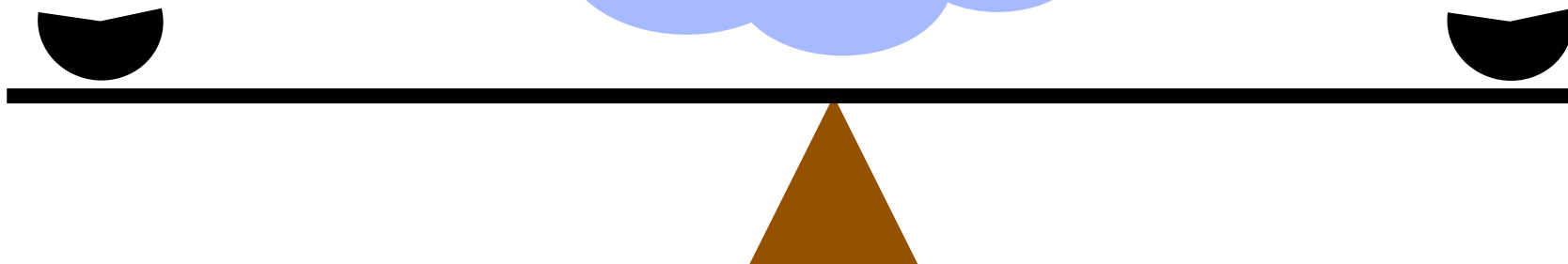
The challenge



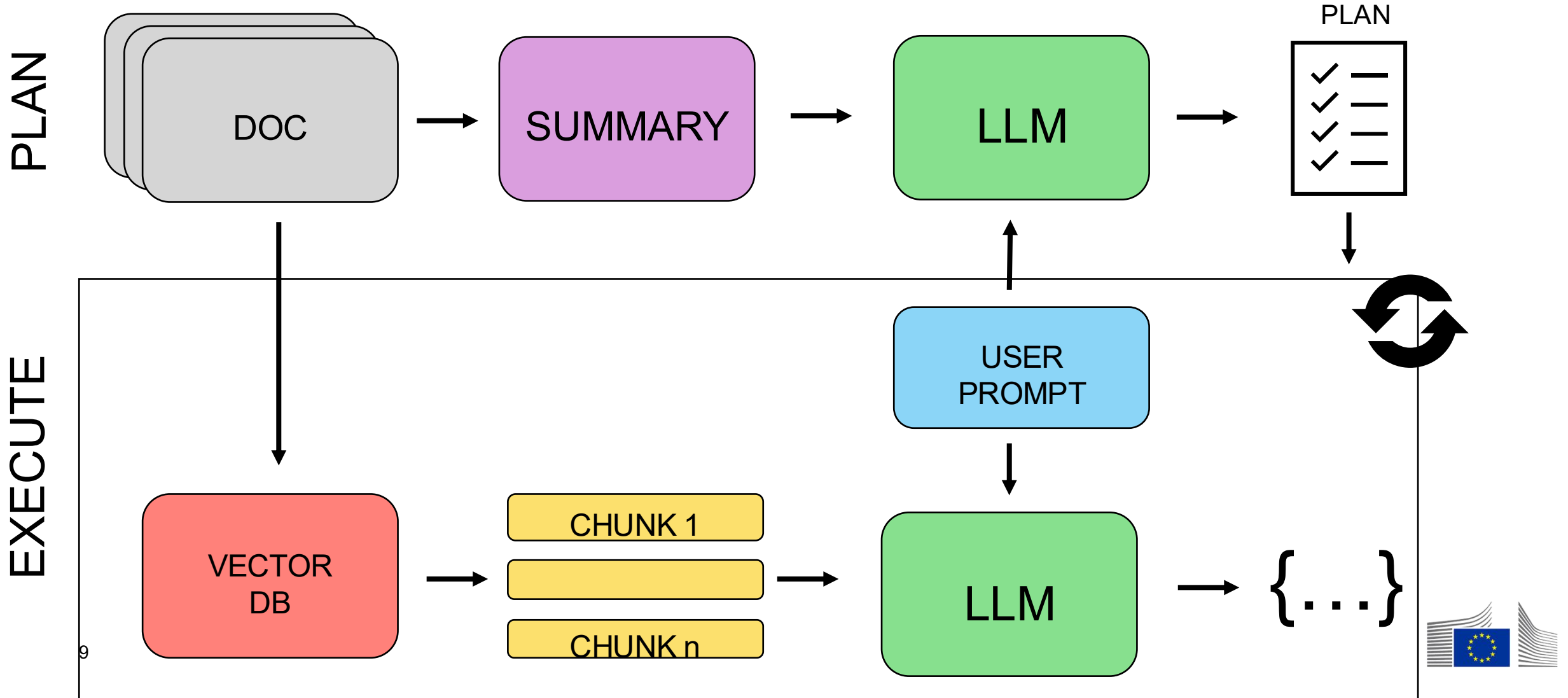
Overflow the LLM
with too few info



Overflow the LLM
with too many info



Dynamic Context Injection: The tradeoff





How can I help you today?

+ Type a message...



AI can make mistakes. Please verify important information.



Thank you



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