



New KEK ccPortal and LLM-Based User Support

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What I Want to Share Today



Current system

ccPortal is application web portal.



UX improvements

improve the design and usability



AI-based user support

We plan to expand the service by using generative AI.

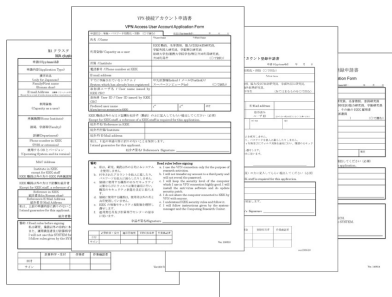
What is ccPortal?

ccPortal: A platform that makes application workflows together

- ccPortal makes 25 paper-based application workflows into one system.
 - Before ccPortal, these workflows were handled separately.
- more than 4,000 users use ccPortal

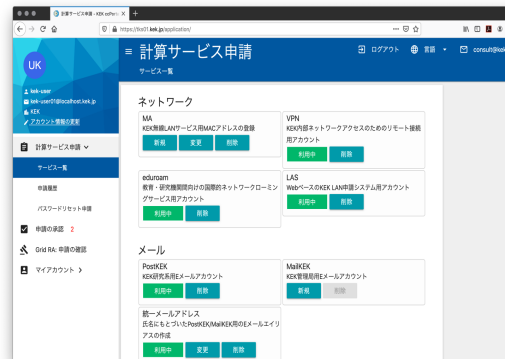
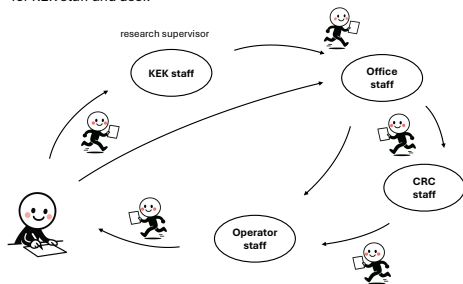
 It gives users one clear gateway.

 It also provides a good base for AI and other support functions.



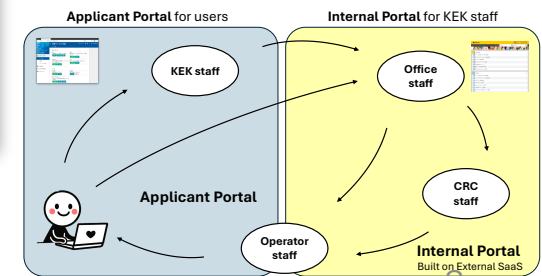
Paper Process is complicated.

The paper-based application process was complex and time-consuming for KEK staff and user.



Two-Portal Architecture

ccPortal is designed with a dual-portal architecture to serve different user needs and facilitate research processes.



Two portals, one solution: ccPortal

What Worked Well in ccPortal

One Portal

- Many services are available in one place.
- Users do not have to wonder where to start.

Digital Transformation

- Application and approval workflows become simpler.
- We can reduce paper-based work.

Improve UX

- The service become easier to use.
- Users can now understand which form to use and where to check the status.

As the next step, we are considering introducing an **AI-based user support.**

What We Want to Add Next?

Enhanced UX

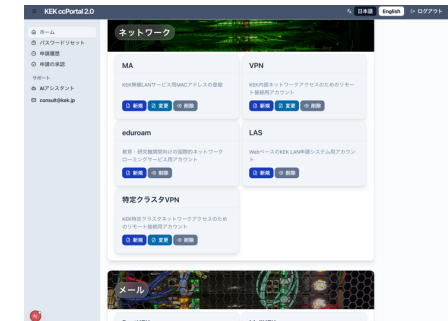
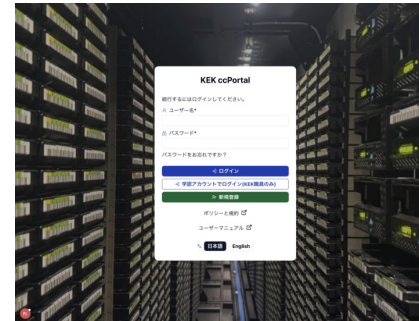
- clear and more modern UI
- better support for the smartphones

More user friendly

- expand the portal beyond application submission
 - For example, it could answer common questions, guide users to the right procedure, and suggest related services.

Use of AI

- Generative AI can help us add search, guidance, and conversation.



What Services Can We Build with AI?

Support Desk with Generative AI

As a first step, the system can check manuals and past Q&A and answer user questions in natural language.

This is a practical and realistic starting point.



Future Plan...

In the future, ccPortal could become more interactive.

For example: voice guidance, application support, service recommendation, next-action suggestions

Why AI Help Desk?

Quick Response

- It can help users outside business hours.
- This is especially useful for foreign users.

Better Use of Existing Knowledge

- We already have many manuals and past Q&A records.
- However, it is not always easy to find the right information at the right time.
- We hope AI can help users find what they need more quickly.

Reduce Routine Work

- If AI can answer routine questions, staff can spend more time on difficult cases and troubleshooting.

AI Help Desk Architecture

Handles the reasoning layer

LLM

Large Language Model

- LLM uses the retrieved information to generate a natural answer.
- we are testing open-language models such as:

- gemma3:27b
- gpt-oss:20b



Ollama



LangChain



Sarashina

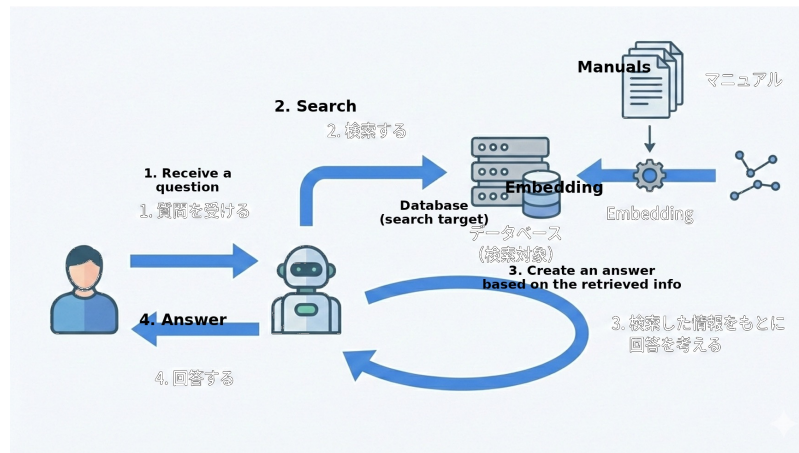
- This approach can make it easier to answer based on evidence.
- When the knowledge base is updated, the system can reflect latest information.
- By keeping the data in a local environment, we can reduce the risk of data leakage.

Complements domain knowledge

RAG

Retrieval-Augmented Generation

- It retrieves relevant information from a knowledge base such as manuals and past Q&A

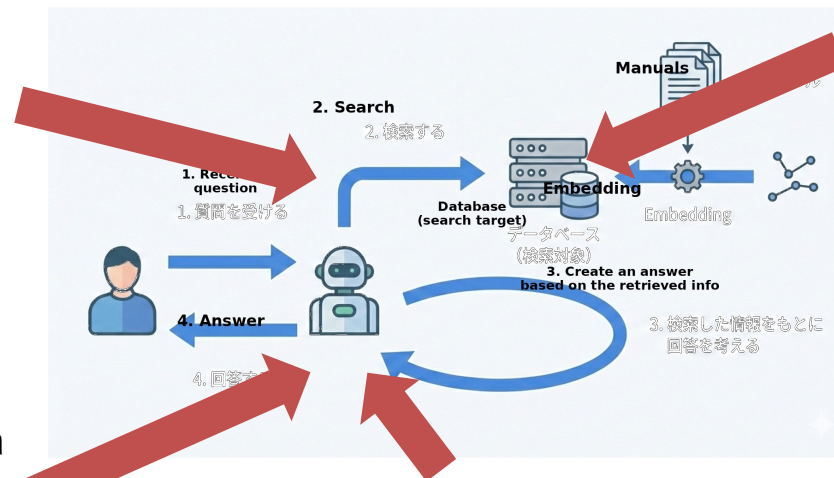


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How the System Finds Information and Builds an Answer

1 Embedding

The system converts questions and documents into vector representations.



2 Similarity Search

It compares those vectors and retrieve the most relevant documents.

3 Answer Generation

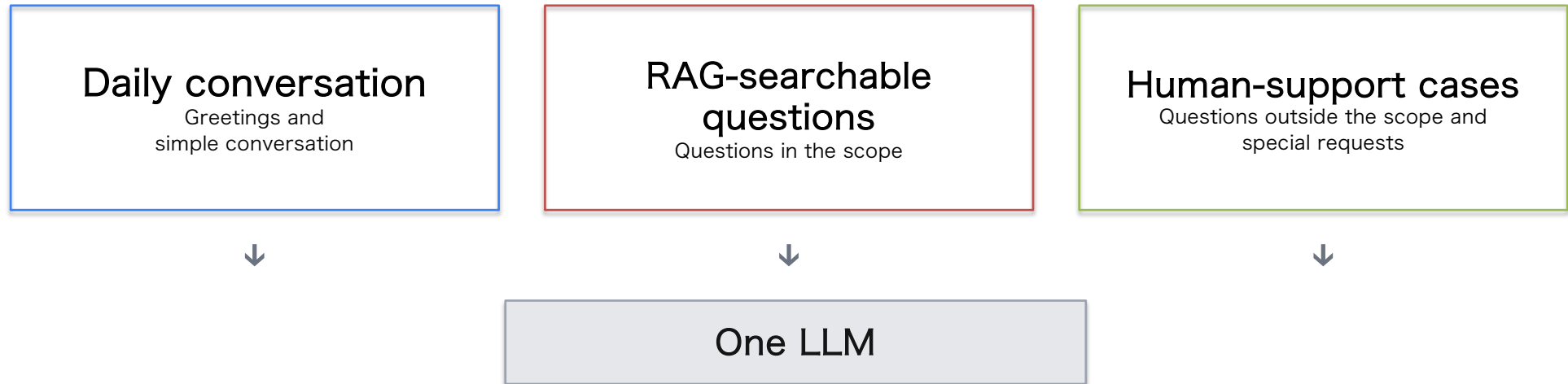
The retrieved documents are passed to the LLM as context. Then, the LLM generates an answer.

Prompt engineering

- We provide instructions so that the AI behaves like a help desk agent.
- Prompt example:

“You are a help desk assistant for the Computing Research Center. Please answer user questions politely and concisely. If the answer is not in the manual, do not guess. Instead, say that the information is not available in the manual.”

Problems observed in the first prototype



It is difficult for one LLM to handle all of these well.

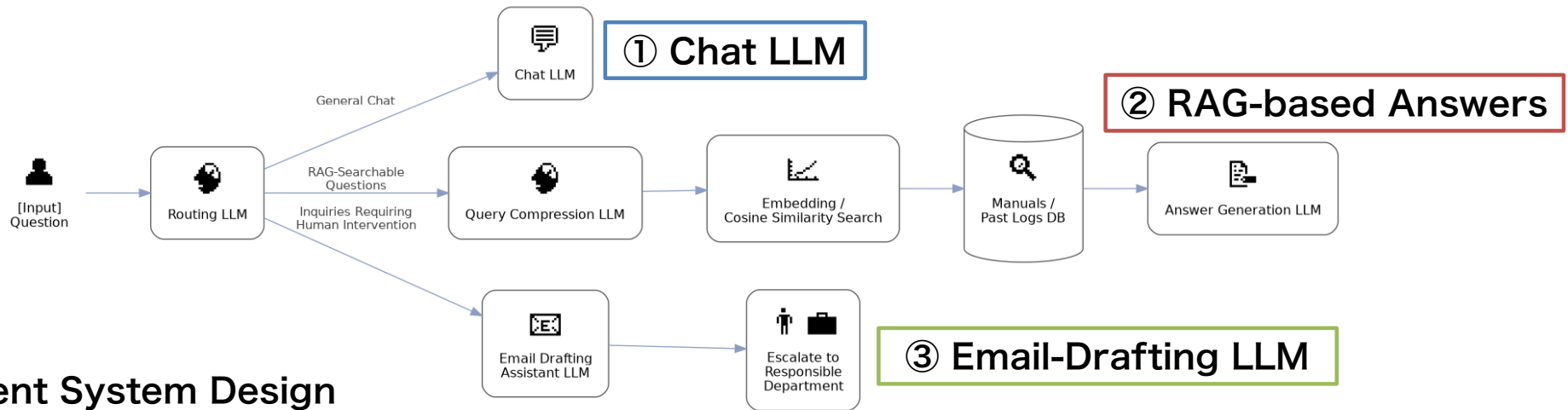
One LLM tried to handle chat, RAG, and escalation in the same flow. The system needs to choose a different path depending on the type of question.

We redesigned the system

- ① Daily conversation are handled by a Chat LLM.
- ② Questions in the scope are answered by RAG.
- ③ Questions outside the scope are guided to the responsible office.

The next slide shows the resulting three-path architecture.

Current Architecture and Development Status



Current System Design

- ① Daily conversation is handled by a chat LLM.
- ② When the system receives a question about computing services, it runs a RAG search over the knowledge base and generates an answer based on the retrieved information.
- ③ If the system determines that the question cannot be answered from the knowledge base, it prompts the user to contact the responsible office and uses an LLM to draft an email based on the user's query.

Current Status

- Answer quality is not yet enough in all cases.
- We are building the basic foundation step by step.

Future Challenges

Current Issues

- Answer quality is still not good enough.
- Some answers are still inaccurate or incomplete, especially for complex questions.

Possible Improvements

- We can get better results if we organize the source data more carefully before adding it to the knowledge base.
- For example, we can convert manuals and past Q&A into more structured data, with clear tags, headings, and categories. This helps the system find and use the right information more accurately.

Next Steps

- Fine-tuning or additional training can further improve the system.
- Before that, it is more effective to improve the data structure, prompts, and evaluation cases first.

Another Important Point

- AI does not need to answer every question perfectly.
- For difficult cases, it is important to connect users smoothly to support staff.

Summary



- ccPortal is a strong system for application services.
- We want to build on it and provide better user support.
- Our next step is to add AI-based support to this platform.
- We are developing the system step by step.