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RWTHgpt - a data friendly approach to using GPT

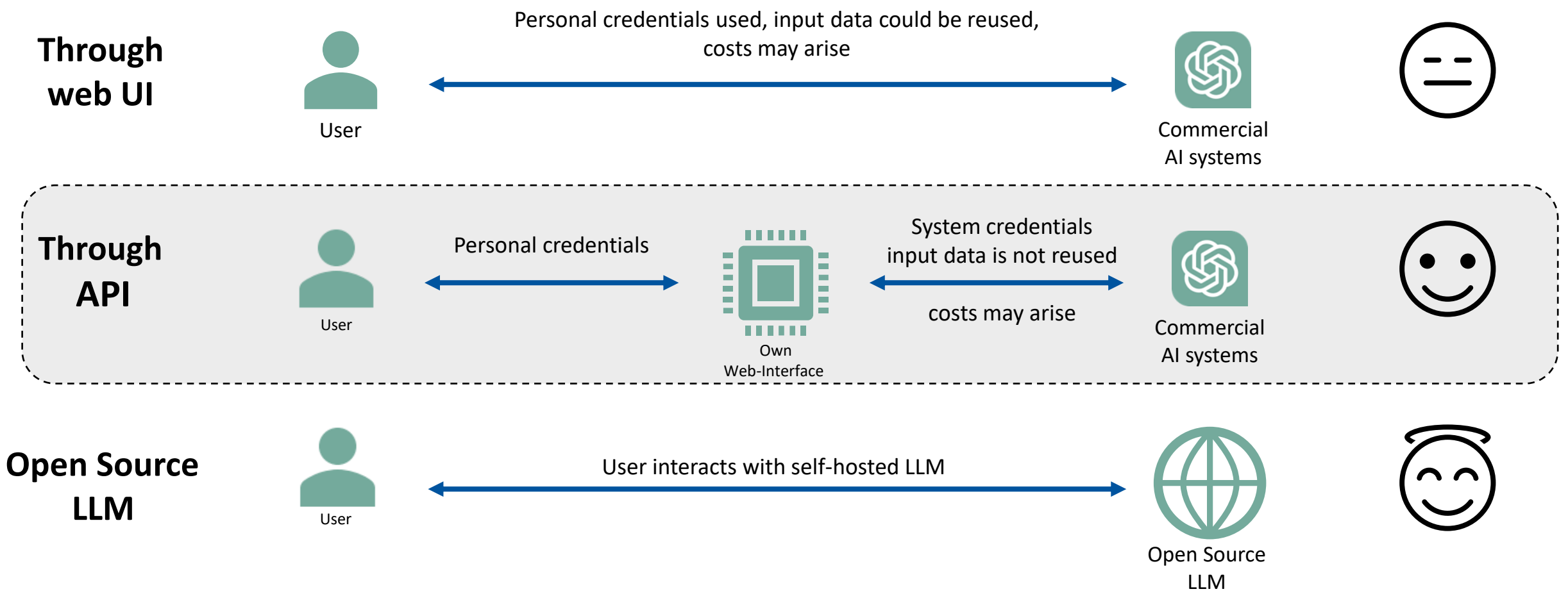
Bernd Decker

IT Center | RWTH AACHEN UNIVERSITY

Current state

- Generative AI is already widely used for research, teaching and administration at universities
- Only very few universities provide opportunities for regulated access
  - → Unregulated usage of free services on the internet with private accounts
  - → Confidential information could be shared with the AI
  - → Chat content is processed and stored US server
  - → Full GDPR compliance is probably not given
- Demand from universities to integrate AI into central processes

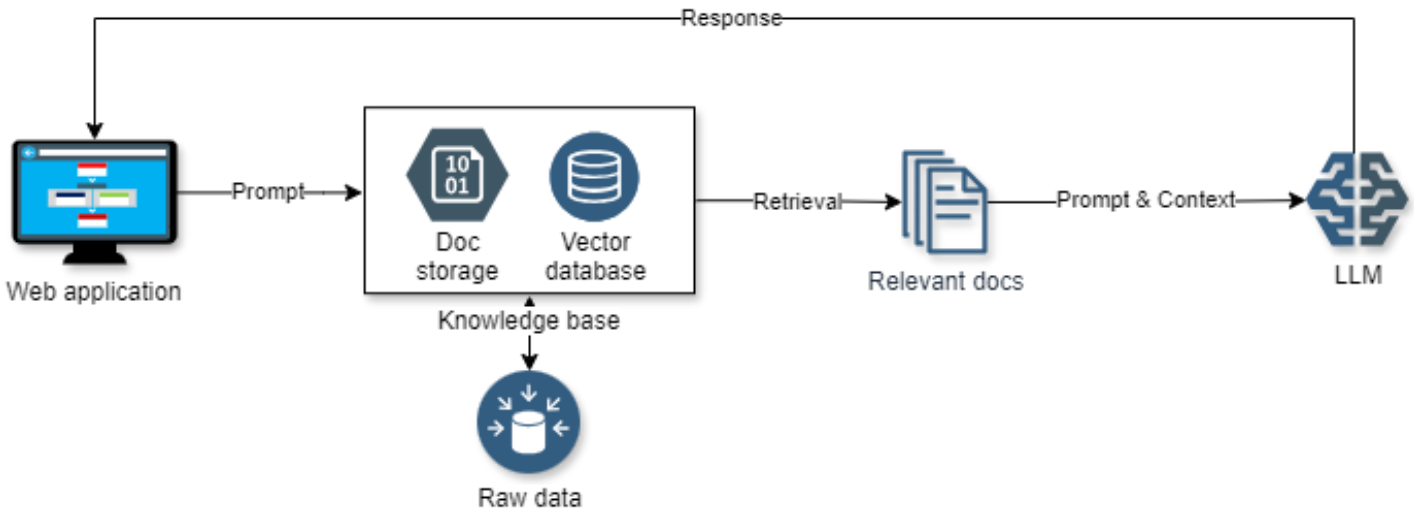
Szenarios


Through web UI
User
Personal credentials used, input data could be reused, costs may arise
Commercial AI systems
Through API
User
Personal credentials
Own Web-Interface
System credentials input data is not reused
costs may arise
Commercial AI systems
Open Source LLM
User
User interacts with self-hosted LLM
Open Source LLM

Azure OpenAI

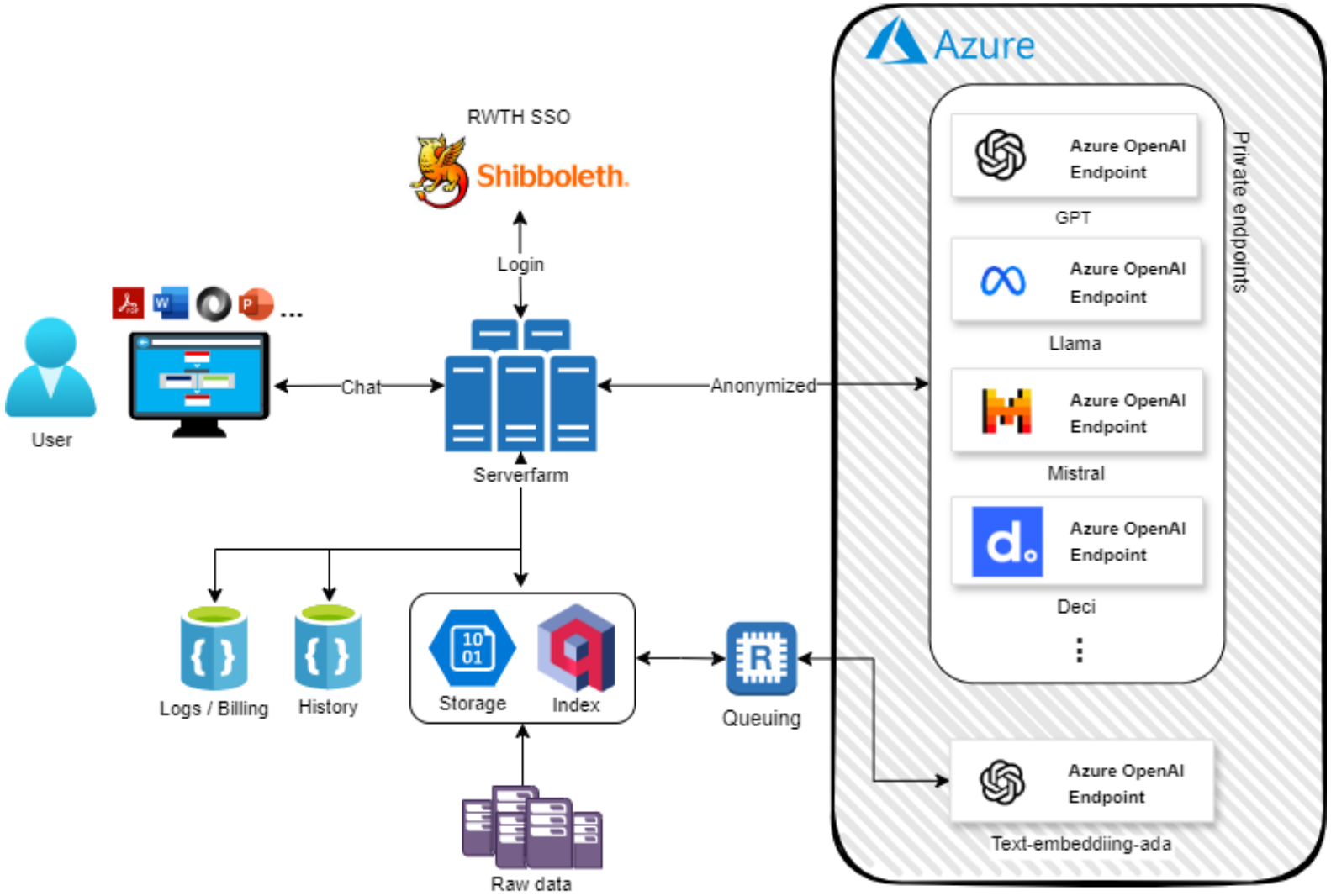
- Clear focus on business customers and their requirements in terms of availability, security, data protection and compliance
  - Features for high availability, monitoring, disaster recovery and backup with various redundancy options
  - Security functions such as RBAC, strong encryption (both stored and during transmission) and network isolation
  - Compliance with various regulations and standards, such as GDPR, HIPAA and ISO 27001
- Prompts (inputs), completions (outputs), embeddings and training data
  - not used to improve models or any Microsoft or 3rd party products or services
  - not available to other customers or OpenAI
- To detect abuse all prompts and generated content is stored for up to thirty days
  - Customers can request an exemption from abuse monitoring
- Wide range of different models

Components

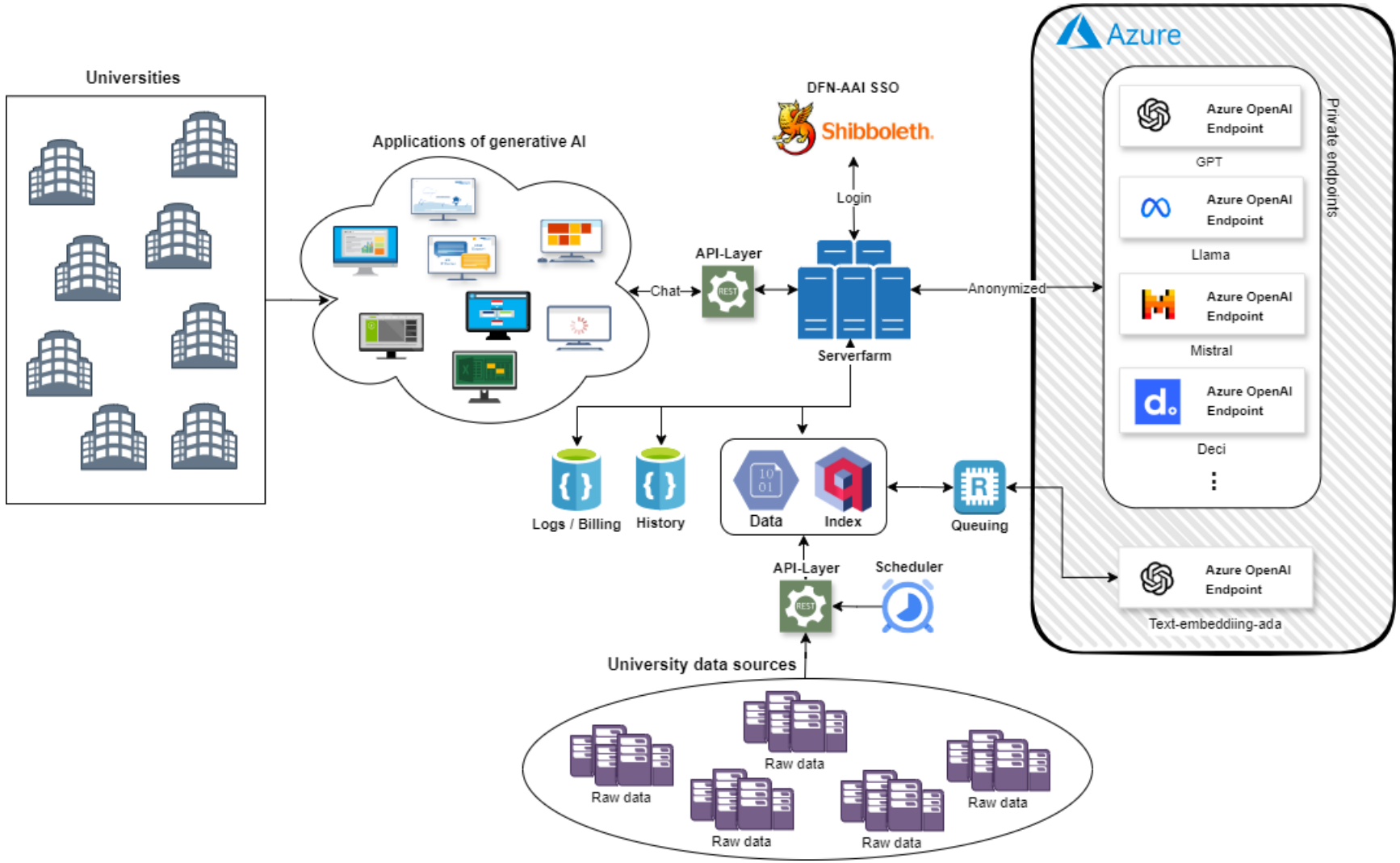


- **Web application**: point of human-computer interaction
- **Raw data**: unprocessed and unstructured data
- **Knowledge base**: structured repository for indexed documents, combination of a vector store and document store
- **Relevant docs**: a subset of documents that is most useful for answering the prompt
- **Context**: necessary background or information for the language model to generate its response
- **LLM**: machine learning model that will generate a response based on the context and prompt

RWTHgpt architecture



NRWgpt


Universities
Applications of generative AI
DFN-AAI SSO
Shibboleth
Login
API-Layer
Chat
Serverfarm
Anonymized
Azure
Azure OpenAI Endpoint
GPT
Azure OpenAI Endpoint
Llama
Azure OpenAI Endpoint
Mistral
Azure OpenAI Endpoint
Deci
Private endpoints
Logs / Billing
History
Data
Index
Queuing
API-Layer
Scheduler
Azure OpenAI Endpoint
Text-embeddiing-ada
University data sources
Raw data
Raw data
Raw data
Raw data
Raw data

Retrieval techniques

Retrieval techniques with influence on the workflow

- Query Transformation: Augment, structure or enhance the input. Like multi query, intent extraction, chain of thoughts
- Index: Alternative embeddings per document in addition to normal embeddings of document. E.g embeddings of a summary, hypothetical questions, or any other custom text
- Retrieval Methods: Methods to pull documents out of the knowledge base. Like Top-K Similarity Search or Maximum Marginal Relevance
- Document Transform: Transform documents before using them as context with the LLM. Used to try to increase signal:noise ratio

Thank you
for your attention!