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# GRCResponder

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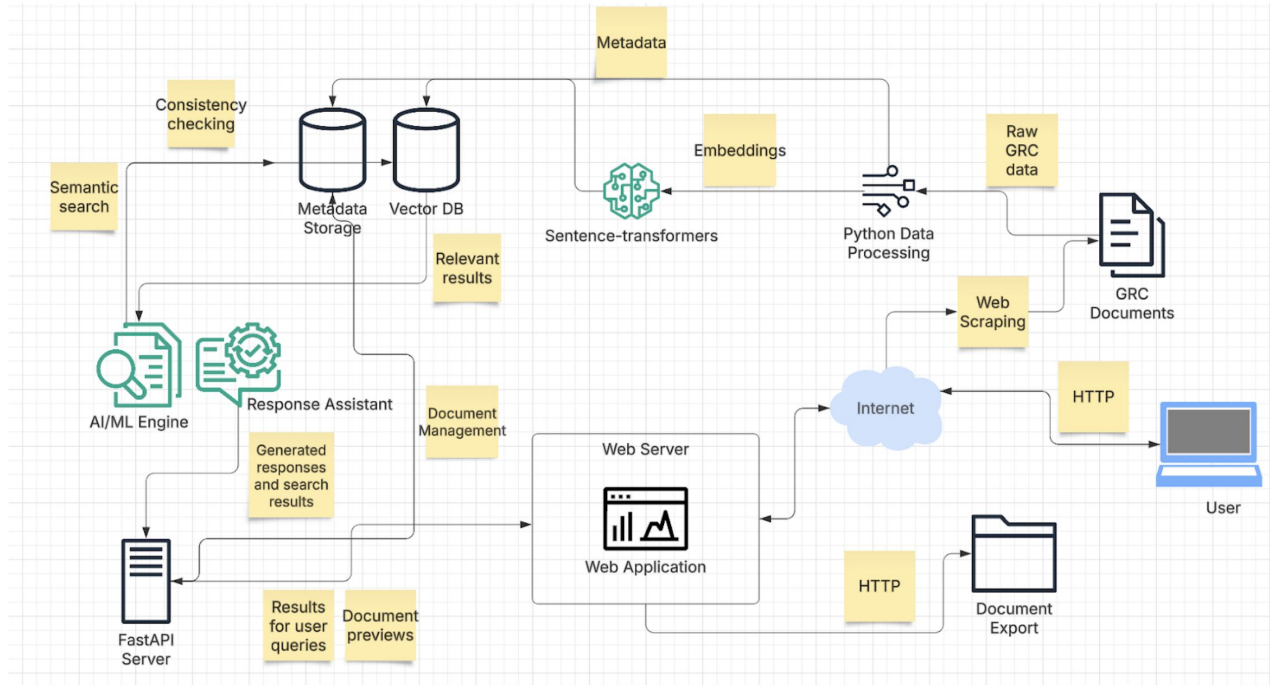
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# Current Timeline...

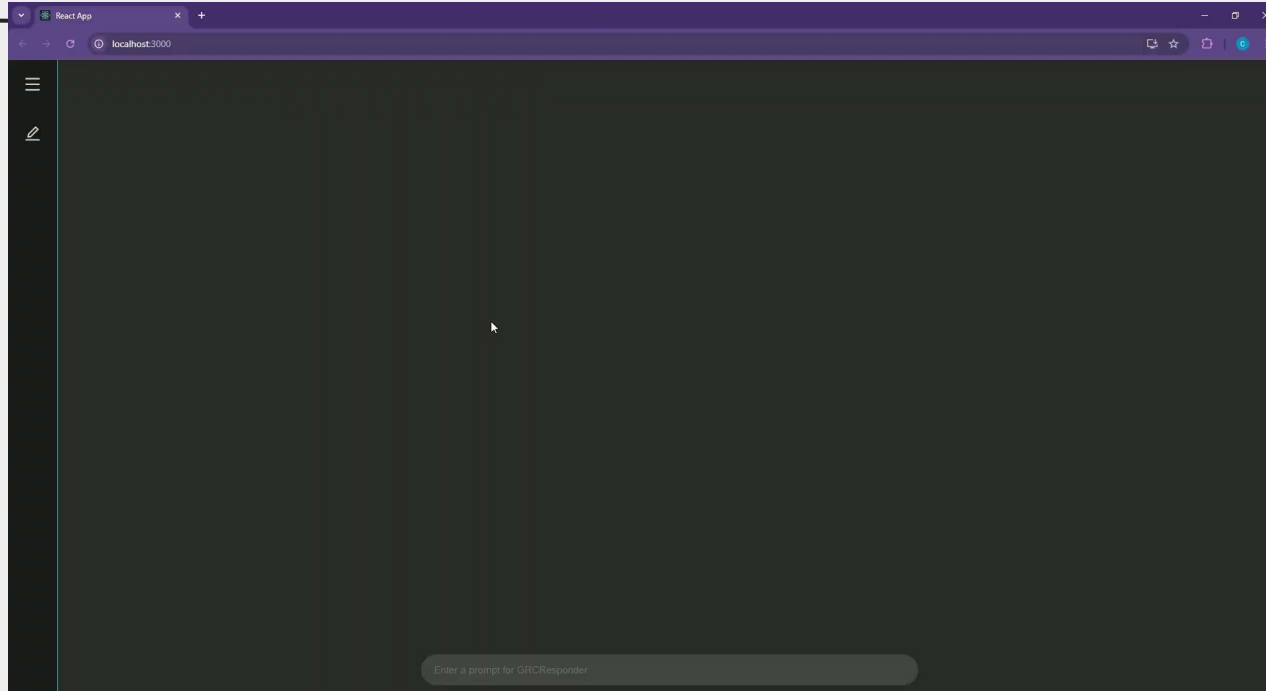
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- **Week 6 - 7: Testing & Refine performance**
  - Polish web app based on user testing
  - Begin documentation/report
  - Host on UCI Server (Pending TA + Professor Guidance)
  - Deliverables: Web app link, report
- **Week 8 - 9: Wrap up any last-minute changes or performance updates**

# System Architecture



# Prototype Demo



# Retrieval Optimization

## Example Query

What are historical examples of Pacific Gas and Electricity rate justifications prior to 2020?

## Challenges:

- Narrowing proceeding search to only include those that include relevant metadata fields
  - **Filed\_by** : Pacific Gas and Electric Company
  - **Category**: Ratesetting
  - **Filing\_year**: <= 2020

# Retrieval Optimization

## Searching by Company Name:

- Lack of consistency on CPUC proceeding pages
- Picking up on different versions of company names (e.g. Pacific Gas and Electric vs PG&E)

## Searching by Proceeding Year:

- Mismatch between filing date and target year, 2023 GRC filed in 2021
- Documents submitted across multiple years

```
"pacific gas and elecric company": [  
  "pacific gas and elecric company",  
  "pacific gas and electric",  
  "pacific gas and electric (ead)",  
  "pacific gas and electric co",  
  "pacific gas and electric co.",  
  "pacific gas and electric compa",  
  "pacific gas and electric company",  
  "pacific gas and electric company (u 39 e)"  
],
```

# Current Approach

## Embedding Search on Proceeding Description:

- Create separate collection on the description of the proceeding
- Find relevant proceedings by searching on description, use results to narrow down search
- Potential issues still exist with abbreviations like PG&E

### **Description:**

Application of Pacific Gas and Electric Company for Authority, Among Other Things, to Increase Rates and Charges for Electric and Gas Service Effective on January 1, 2023. (U39M)



# Performance

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- **Prototype batch-processing + multithreading is running**

Still at batch size = 3 on 4 worker threads

handles a small test sample end-to-end without crashing.

- **metadata tweaks**

Added basic length + source-ID fields to the metadata schema

- **Early validation set taking shape**

Assembled a ~60-item sample set to sanity-check embedding quality.

Accuracy needs improvement

# LLM Updates

## Current Status:

- Switched to gemini-2.0-flash for llm due to limitations of Llama 3.2
- Using Gemini api
- Evaluation:
  - Relevance of retrieved context
  - Context usage

## Preliminary Metrics w/ K=8:

Average relevance score: 1.84/5

Average usage score: 1.76/5

Number of entries with hallucinations:  
33/60

Query + Response: ~4.5 Seconds

## Ongoing Work:

- Improve retrieval and context usage

| Model            | RPM | TPM       | RPD   |
|------------------|-----|-----------|-------|
| Gemini 2.0 Flash | 15  | 1,000,000 | 1,500 |

# LLM Updates

## Sample Responses

### Bad Response (Relevance 0, Usage 0)

```
Q: Yes/No: By the end of 2021, did 98% of exclusive CSO customers make payments through other channels?
C: None
Gemini + RAG A: I do not have access to specific customer data or payment channel information. Therefore, I cannot answer this question.
LLM + Full Document: Yes. By December 31, 2021, 98% of exclusive CSO customers had made a payment using mail, web, phone, or Neighborhood Payment Centers instead of CSOs. (§ 25)
```

### Good Response (Relevance: 5, Usage: 5)

```
Prompt:
What communication methods will PG&E use to inform its customers within 90 days of the Commission's approval of the CSO Closure and Transformation Proposal?

Sample LLM:
Within 90 days of the California Public Utilities Commission's (CPUC) approval of the CSO Closure and Transformation Proposal, PG&E plans to inform its customers about the closure of 65 Customer Service Offices (CSOs) through the following communication methods:

1. **Direct Mail and Email Notices:** PG&E will send direct mail and email notices to approximately 128,000 customers who exclusively used CSOs. These notices will include:
    * The CPUC's decision to close the CSOs and the closure dates.
    * A list of available alternative channels for payments and non-payment transactions, including the name and address of the nearest Neighborhood Payment Center (NPC).
    * Customer service phone numbers and website addresses for additional information and support.
    * A list of Community Based Organizations (CBOs) that PG&E compensates to provide customers with information and financial assistance support (PG&E GRC 2023, Exh. 1, p. 23).
    * Signage translated into Spanish and/or Chinese, including tagline translations in 13 other non-English languages, directing customers to customer service numbers for payment information in their preferred language (PG&E GRC 2023, Exh. 1, pp. 23-24).

2. **Community Meetings:** PG&E will meet with representatives of each community affected by the CSO closures to inform them of the closures and discuss plans to mitigate the impacts on customers (PG&E GRC 2023, Exh. 1, p. 24).

PG&E will also track and report specific metrics for three years in a CSO Annual Report to measure the impacts of the CSO Closure and Transformation Proposal. These metrics include:
    * The success rate of customer contact attempts.
    * The number of call backs received.
    * The average speed of answer (ASA) for the call center and web-based online completion rates.
    * The number of customers enrolled by CSO employees in the CARE, FERA, AMP, and other assistance programs.
    * The number of ESA program referrals (PG&E GRC 2023, Exh. 1, p. 24).

Would you like me to explore any aspect of this response in greater depth or address related regulatory considerations?

GT LLM:
Within 90 days of approval, PG&E will: (1) send direct mail and email notices to its approximately 128,000 "exclusive CSO" customers, detailing the closure decision, alternative payment channels (including names and addresses of nearby Neighborhood Payment Centers), customer service phone numbers and website links, a list of compensated community-based organizations (CBOs) providing financial assistance support, and messages translated into the 15 most-common non-English languages; (2) provide these CBOs with the same information to share with their constituents; (3) post multilingual signage at each closed CSO for at least one year (or until PG&E vacates), both on-site and on its website, pointing customers to phone numbers for payment information; and (4) meet with representatives of impacted communities—including elected officials, tribal representatives, and CBO leaders—to explain the closures and discuss mitigation measures. (§ D.2.2.1)
```

# LLM Updates

## Q&A Dataset Update

- **Scope:** Sets of 6 Q&A pairs from proceedings **A2106021** & **A2204016**
- **Models:** Questions answered by OpenAI o4-mini-high & Sonnet 3.7
- **Question Types:**
  - Factual (who/what/when)
  - Analytical (why/how)
  - Yes/No w/ citation
- **Answer Specs:**
  - Citations (e.g., “¶ 12”)
  - ~200 words for analytical insights
- **Difficulty Labels:** easy/medium/hard
  - *Easy:* direct fact retrieval
  - *Medium:* synthesis of multiple points
  - *Hard:* deeper analysis or cross-section logic

```
{  
  "question": "Which application number does Decision 25-03-008 address?",  
  "answer": "Decision 25-03-008 pertains to Application No. 21-06-021. (p. i)",  
  "difficulty": "easy",  
  "document_identification": "[A2106021] PG&E Self Insurance Final Decision, p. i"  
},
```

# Web Updates

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- Integrated with LLM!!

## Pending Tasks

- Once the LLM response is updated with documents, edit the backend to handle it.
- Add a loading signal when LLM response is being created.
- Add DELETE method for past chats

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# Questions?

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