

:: SYSTEMIX BOT ::

YOUR PERSONAL ASSISTANT ON
COMPLEX SYSTEMS INNOVATION

Made during an AI Hackathon by LabLab.AI

12-19 APRIL 2024

A decorative graphic at the bottom of the slide consisting of a grey-to-white gradient background with a hexagonal pattern that tapers from left to right.

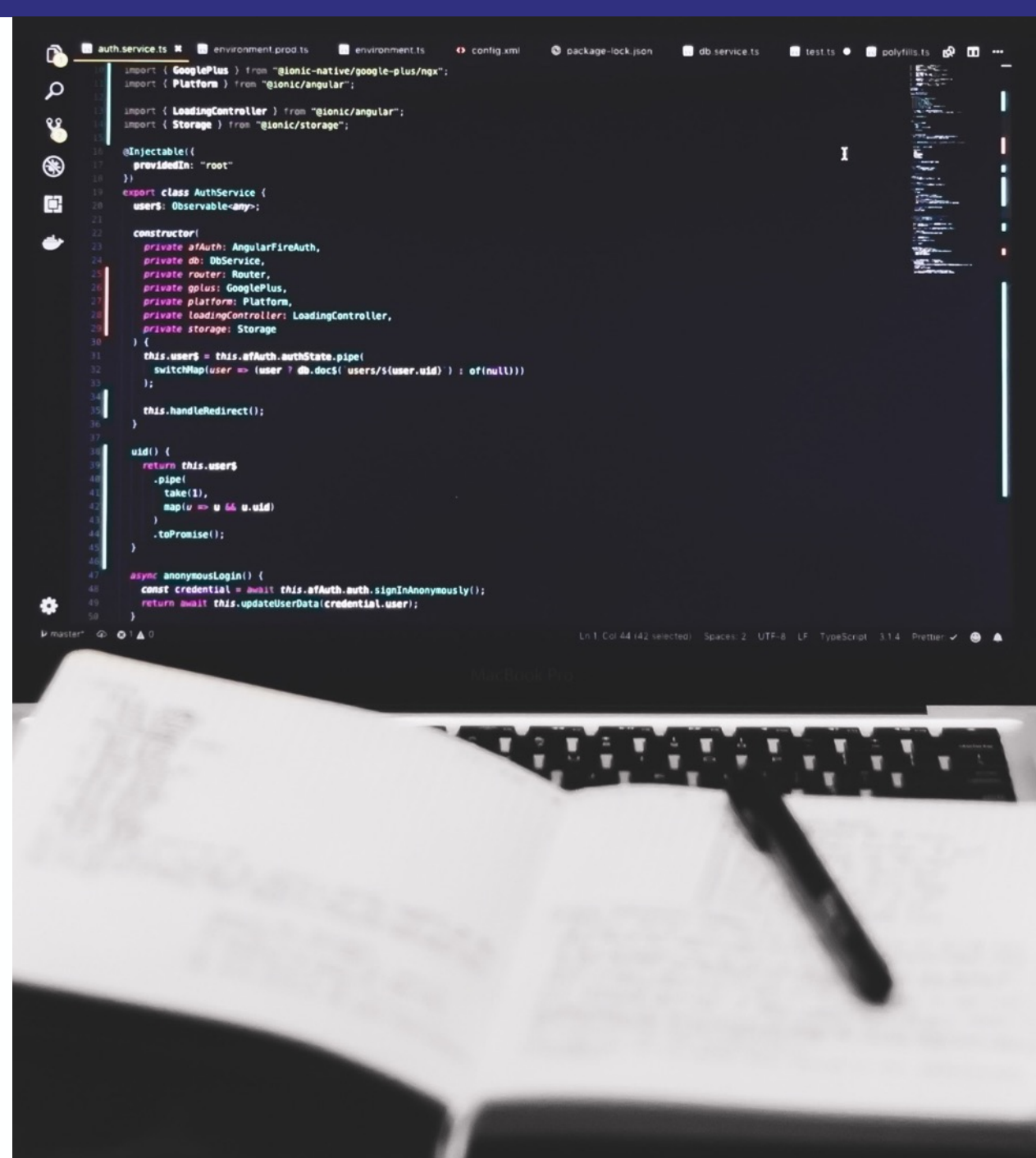
DURING AN AI HACKATHON
BY LABLAB.AI,
THE MISSION WAS TO DEVELOP
ADVANCED RAG APPS and CHATBOTS,
INTEGRATING CUTTING-EDGE TECHNOLOGIES
such as GenAI, LLM, RAG with cool platforms like
VECTARA, LLAMAINDEX, TOGETHER AI, and UNSTRUCTURED.IO.



LlamaIndex

AGENDA

1. Cover Pages
2. The Importance of Systems
3. Problem & Solution
4. KEY Features & Technology
5. Introduction of the Product
6. Tech Fundamentals
7. Development of the App
8. Structure of the Code & UI
9. Team



IMPORTANCE OF SYSTEMS

UNDERSTAND SYSTEMS

"Systems" refer to interconnected elements and components that work together to achieve a particular purpose or function. In the context of various fields such as business, engineering, biology, and social sciences, systems can be physical (e.g., a transportation system), conceptual (e.g., an organizational system), or abstract (e.g., a communication system).

Holistic Understanding: Systems thinking encourages individuals to view problems and phenomena in a holistic manner, considering the relationships, interactions, and interdependencies between various components of a system. This approach enables a deeper understanding of complex issues and helps in identifying effective solutions.

Interconnectedness: Systems are composed of interconnected elements that influence each other within a larger system. Understanding the interconnected nature of systems helps in predicting the effects of changes and interventions in one part of the system on other components.

UNDERSTAND SYSTEMS

Problem-solving: Systems thinking provides a structured approach to problem-solving by analyzing systems as a whole rather than focusing on isolated parts. It helps in identifying root causes of problems, addressing underlying issues, and developing sustainable solutions that consider the systemic impact.

Innovation and optimization:: By understanding systems, individuals can identify opportunities for innovation, optimization, and improvement within systems. This may involve redesigning processes, streamlining operations, or introducing new technologies to enhance the overall performance and efficiency of the system.

Sustainability: It is essential for addressing complex challenges such as environmental sustainability, social equity, & economic development. By considering the interconnected nature of systems & their long-term consequences, individuals can develop strategies that promote sustainable practices & outcomes.

Overall, the importance of systems lies in their role as the basis for understanding, analyzing, and improving complex systems in diverse domains. It provides a valuable framework for problem-solving, decision-making, innovation, and fostering sustainable practices in a rapidly changing world.

PROBLEM & SOLUTION

PROBLEM STATEMENT

Despite a growing interest in systems thinking and innovation, individuals may struggle to understand complex concepts such as systems theory and systemic design, hampering their ability to drive meaningful change in their respective fields.

Lack of easily accessible resources and support for individuals seeking to deepen their understanding of systems thinking and innovation.

Limited opportunities for engaging in real-time, personalized conversations on complex systems concepts and their practical application in various industries.

AN ON-THE-GO SOLUTION

Introducing SystemiX App, a 24/7 responsive chatbot on your palm designed to engage you in short, interactive conversations on systems thinking, theory, design, and innovation.

Leveraging your particular data, SystemiX Bot provides tailored insights and resource references to help you better understand and apply systems concepts in your work life and projects.

KEY FEATURES & TECHNOLOGY

KEY HIGHLIGHTS & TECHNOLOGICAL ADVANCEMENTS

An AI RETRIEVAL AUGMENTED GENERATION TECHNOLOGY.

Simplifies data ingestion in RAG pipelines, enhancing process efficiency.

Smart Indexing and querying function from a uploaded corpus at Vectara database.

Integration with other LLM and GenAI solution platforms.

Leverages UNSTRUCTURED library for advanced preprocessing of diverse file types.

Implements Query and Summarization APIs for accurate responses.

Seamlessly imports data into Vectara corpus using Indexing API.

Leverages Chat API for interactive and user-friendly communication.

Boomerang embeddings deliver powerful text encoding for enhanced retrieval accuracy

Provides concise and relevant responses to user inquiries.

Enhanced efficiency in information retrieval.

Faster access to relevant information.

Potential for expansion into diverse industries.

INTRODUCTION OF THE PRODUCT

INTRODUCING SYSTEMiX


What is actually **SystemiX** App?


A responsive chatbot based on your particular dataset
about **Systems Thinking,**
Systems Theory,
Systemic Design
and
Systems Innovation
to spark short conversations and clearing your doubts
about complex systems.


: SystemiX App :


Your Personal Systemic Design Assistant


Empowering conversations on Systems Innovation, Systems Theory and Systems Thinking with this intuitive chatbot

 Hi! I'm here to help you on above topics with vast database

 What is SystemiX App

 The returned results did not contain sufficient information to be summarized into a useful answer for your query. Please try a different search or restate your query differently.

 **You:**
Systemic Design

 Systemic Design is an approach to designing systems that is open to the emergence of different outcomes due to the inherent uncertainty of the future. It involves designing for connections between parts of a system, governed by rules or protocols of interaction. The design focuses on how parts interact constructively or destructively, working with feedback loops and nonlinear processes of change [Citation].

Systemic Design principles guide design choices and are aligned with the nature of the systems being designed. They are derived from the basic characteristics and dynamics of complex systems. The advent of information technology and connectivity has made the systems we design today more complex, necessitating these new design principles [Citation][Citation].

However, the search results also included irrelevant information about database isolation levels, programming languages, and online payments [Citation][Citation], which do not contribute to the understanding of Systemic Design.

Your message

HOW 'SYSTEMS' HELPED IN THE CHATBOT IDEATION

The concept of "**Systems**" is crucial in the context of chatbot creation, particularly for a chatbot like **SystemiX Bot** that focuses on Systems Innovation. Here are some key reasons why systems thinking is important in the development and functioning of this chatbot:

Holistic Understanding: Systems thinking allows developers to take a holistic approach to designing the chatbot, considering the interconnections and relationships between various components. This enables a comprehensive understanding of how the chatbot fits within the broader context of Systems Innovation.

Interconnectedness: Systems theory emphasizes the interconnected nature of systems, highlighting how changes in one part of the system can have cascading effects across the entire system. By incorporating systems thinking into the chatbot's design, developers can better anticipate and address potential feedback loops and unintended consequences.

HOW 'SYSTEMS' HELPED IN THE CHATBOT IDEATION

Systemic Design: Systemic design principles can guide the creation of the chatbot interface, user experience, and functionality in a way that aligns with the broader goals of Systems Innovation. This involves considering not only individual features but also how they work together to create a cohesive and effective system.

Systems Innovation: The chatbot itself serves as a tool for facilitating Systems Innovation, which involves identifying and implementing new ways of addressing complex challenges within systems. By leveraging systems thinking in the chatbot's functionality and user interactions, it can help users explore innovative solutions and approaches to systemic issues.

In summary, incorporating systems thinking and principles into the creation of the chatbot enhances its effectiveness in engaging users in meaningful conversations about Systems Innovation, encouraging a deeper understanding of complex systems, and fostering innovative solutions to systemic challenges.

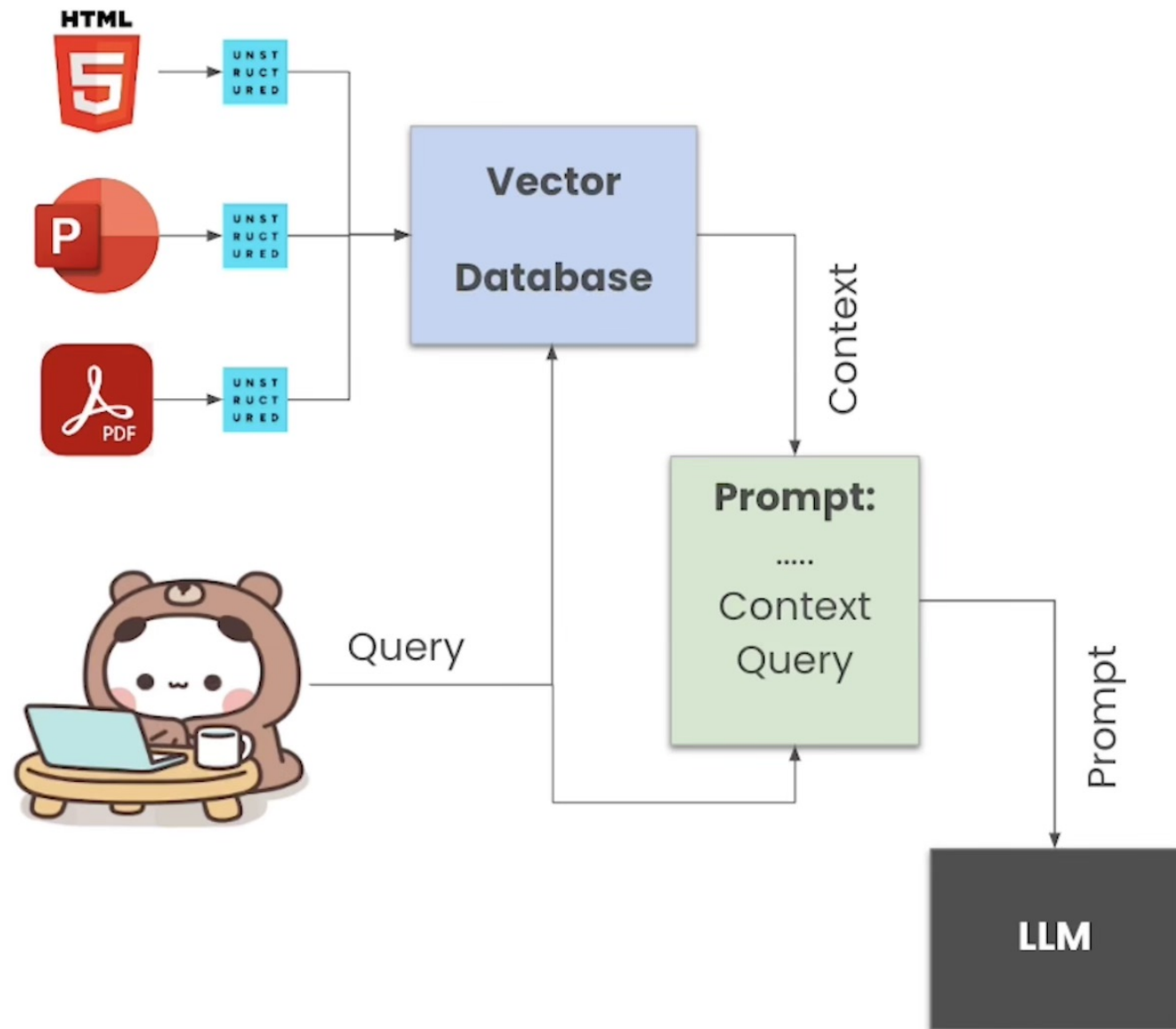
TECHNOLOGY FUNDAMENTALS

Build your own RAG bot

What Is Retrieval-Augmented Generation (RAG)?

RAG (retrieval augmented generation) is an AI methodology that enables large language models (LLMs) to utilize up-to-date, reliable information from external sources, avoiding hallucinations.

It enhances LLMs' responses, ensuring accuracy, transparency, and trust. With RAG, developers can create smarter, more reliable GenAI applications in various fields, while reducing the risk of errors and data leaks.



Normalizing Diverse Documents

Format Diversity: Documents come in a variety of formats (PDF, Word, EPUB, Markdown, etc)

Common Format: The first step in preprocessing is to convert raw documents into a common format that identifies common document elements, like titles and narrative text.

Normalization Benefit: Normalized format allows any document to be processed in the same way, regardless of the source format.

- Filtering out unwanted elements, like headers and footer
- Chunking document elements into sections

Reduced Processing Cost: The initial document preprocessing steps is the most expensive part of the process.

- Downstream tasks like chunking are inexpensive operations on normalized outputs.
- Enables experiment with many different chunking techniques without reprocessing documents.

Semantic Search for LLMs

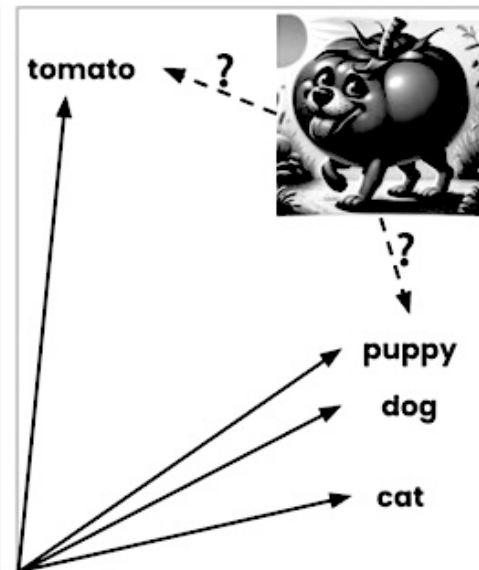
Semantic Search with Vector Databases

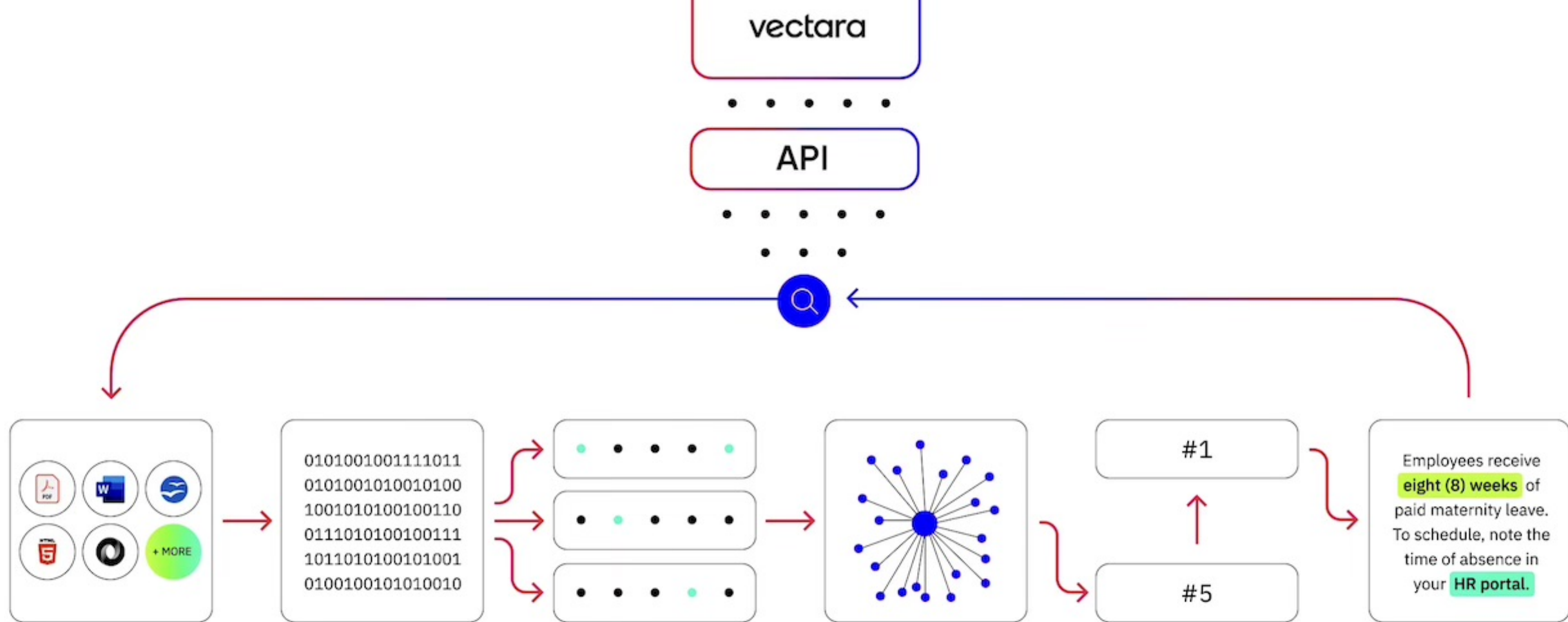
- **Goal:** Given an input text, find semantically similar content from a corpus of documents for use in prompt templates
- **Embedding:** Convert text to vectors that can be compared through a similarity function, such as cosine similarity.
- **Vector Database:** A database optimized for performing similarity search.
- **Prompt Templating:** Insert relevant content into a template to generate a prompt for the LLM. Often content semantically similar to an input query.

Load: Inserts the vectors into the database, along with the source documents or a pointer to the source documents

Query Embed: Embed the input for the similarity search

Compare and Retrieve: Compare the query embedding to documents in the Vector DB; retrieve the k most similar documents





Extract

Vectara automatically extracts text from PDF and Office to JSON, HTML, XML, CommonMark, and many more.

Encode

Encode at scale with cutting edge zero-shot models using deep neural networks optimized for language understanding.

Index

Segment data into any number of indexes storing vector encodings optimized for low latency and high recall.

Retrieve

Recall candidate results from millions of documents using cutting-edge, zero-shot neural network models.

Rerank

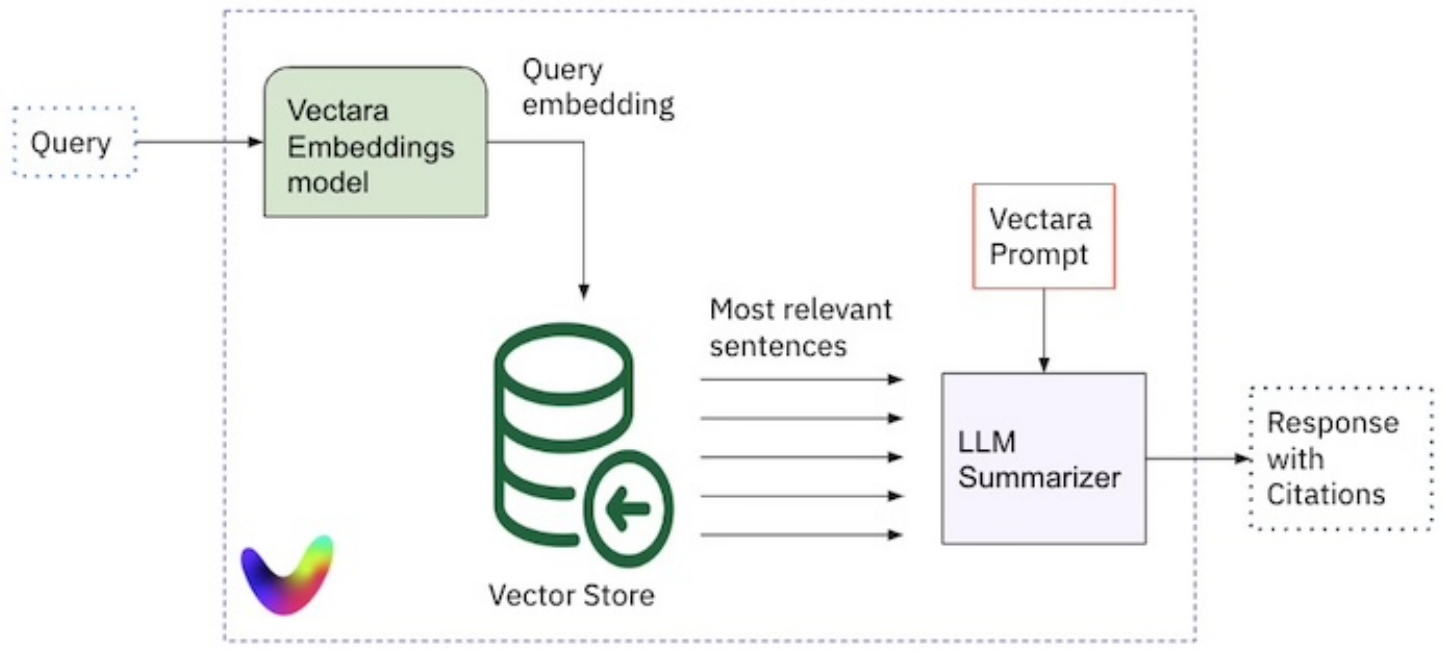
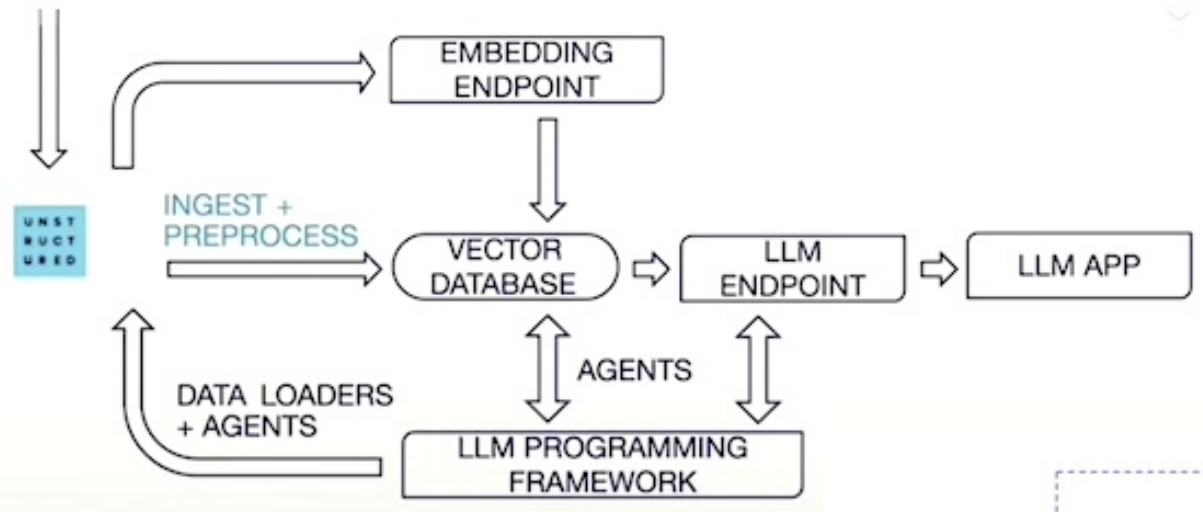
Increase the precision of retrieved results with cross-attentional neural networks to merge and reorder results.

Summarize

Optionally generate a natural language summary of the top results for Q&A or conversational AI experiences.

FINANCE | OPS | HR | LEGAL | OTHER
PDF TAR HTML SQL MSFT Office OST PST Email ZIP XLS/CSV JPEG/PNG Audio ...

slack OneDrive Google Drive elastic snowflake Azure databricks aws



DEVELOPMENT OF THE APP

Paul Vectara Chat App #2

Options History

Ask a question

How do u perform RAG techniques with corpus?

How is data encrypted?

Summarize the CERN document

What is written about Positional Arguments by Paul.B?

How do I Fix Positional Arguments TypeError?

http://192.168.1.2:4444/?query=What+is+written+about+Positional+Arguments+by+Paul.B%3F&

Paul Vectara Docs Search Summary Example

Options History

What is written about Positional Arguments by Paul.B?

Start over

Progress report

- 1 ✓ Received question
- 2 ✓ Retrieved 50 search results in 1.63 seconds
 - Review results
- 3 ✓ Generated summary in 1.65 seconds

Summary

The returned results did not contain sufficient information to be summarized into a useful answer for your query. Please try a different search or restate your query differently.

TRIED NEXT ANOTHER CHAT APP SYSTEMIX

FIRST TRIED DIFFERENT APPS USING VECTARA OPEN-SOURCE PROJECT "CREATE-UI"

...WILL CONTINUE THESE LATER

Welcome to Paul Test Vectara Chat

This demo uses Retrieval Augmented Generation to ask questions about based on Sex

Vectara chat demo: Paul Test Vectara Chat

test test

How may I help you?

Im happy. R u?



KeyError: 'url'

Traceback:

```
File ~/Users/universepaul/PlayPYTHON/VECTARA/vectaraPaulCHAT/RAG-chat-vectara/paulenv/lib/python3.11/site-pack
exec(code, module.__dict__)
File ~/Users/universepaul/PlayPYTHON/VECTARA/vectaraPaulCHAT/RAG-chat-vectara/app.py, line 77, in <module>
    launch_bot()
File ~/Users/universepaul/PlayPYTHON/VECTARA/vectaraPaulCHAT/RAG-chat-vectara/app.py, line 71, in launch_bot
    response = generate_response(prompt)
                ~~~~~
File ~/Users/universepaul/PlayPYTHON/VECTARA/vectaraPaulCHAT/RAG-chat-vectara/app.py, line 13, in generate_re
    response = vq.submit_query(question)
                ~~~~~
File ~/Users/universepaul/PlayPYTHON/VECTARA/vectaraPaulCHAT/RAG-chat-vectara/query.py, line 118, in submit_q
    url = f"({metadata['url']})#:-:txt={quote(text)}"
                ~~~~~
```

Your message

NAVIGATING CHALLENGES

During those sleepless nights and relentless hours throughout the day, I found myself caught in a cycle of debugging and troubleshooting, painstakingly addressing each issue one by one.

The relentless pursuit of resolving these challenges consumed my time and energy, pushing me to the limits of my problem-solving abilities.

The issues I encountered varied in nature, ranging from internal logic problems to query handling, model response management, frontend UI component rendering problems, perfect positioning adjustments, compatibility issues with installed dependencies, and ultimately few after deployment to streamlit cloud.

Each challenge presented a unique set of obstacles that required meticulous attention and expertise to overcome.

Diff b/w Systemic Design, Systems Thinking, Systems Innovation and System Theory?

1

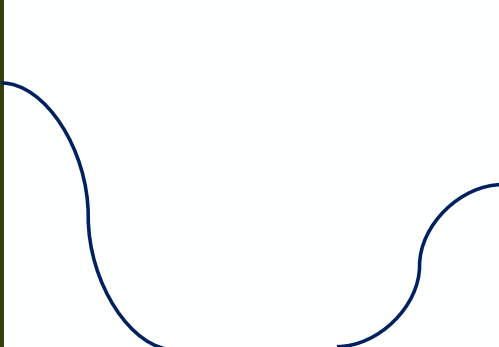
Systems Theory is the core set of concepts or paradigm at the heart of systems thinking. It provides a holistic synthetic view of the world, as opposed to an analytical-reductionist vision [Text Snippet][Text Snippet]. Systems Thinking, on the other hand, is an approach that looks

of an issue. It doesn't reduce complex systems down to their individual parts, but rather looks at how the whole system is organized [Text Snippet][Text Snippet]. Systems Innovation combines systems thinking and innovation. It uses systems thinking to look at issues differently and then changes the system by connecting and organizing it in new ways to realize new outcomes [Text Snippet][Text Snippet]. Unfortunately, the search results did not provide specific information on Systemic Design.

Diff b/w Systemic Design, Systems Thinking, Systems Innovation and System Theory?

2

Systems Theory is the core set of concepts or paradigm at the heart of systems thinking. It provides a holistic synthetic view of the world, as opposed to an analytical-reductionist vision [Text Snippet][Text Snippet][Text Snippet]. Systems Thinking, on the other hand, is an approach that looks at the overall dynamics and systemic conditions of an issue. It doesn't reduce complex systems down to their individual parts, but rather looks at how the whole system is organized [Text Snippet][Text Snippet]. Systems Innovation combines systems thinking and innovation. It uses systems thinking to look at issues differently and then changes the system by connecting and organizing it in new ways to realize new outcomes [Text Snippet][Text Snippet]. Unfortunately, the search results did not provide specific information on Systemic Design.



3

: SystemiX App :

Your Personal Systemic Design Assistant

Empowering conversations on Systems Innovation, Systems Theory and Systems Thinking with this intuitive chatbot

Hi! I'm here to help you on above topics with limited database

Diff b/w Systemic Design, Systems Thinking, Systems Innovation and System Theory?

System Theory is the core set of concepts or paradigm at the heart of Systems Thinking. It focuses on the difference between a holistic synthetic-view of the world and an analytical-reductionist vision. It explores themes like holism, emergence, relational thinking, and process thinking [Text Snippet][Text Snippet][Text Snippet].

Systems Thinking, on the other hand, is an approach that uses these concepts from System Theory to understand and address complex problems. It involves mapping out the actors, structure, and dynamics of a system [Text Snippet].

Systems Innovation is a new approach that combines Systems Thinking and innovation to enable change within complex organizations. Instead of reducing complex systems to their individual parts, it looks at how the whole system is organized and aims to change the way the parts are interrelated to realize new outcomes [Text Snippet][Text Snippet].

The search results did not provide specific information on Systemic Design. Therefore, a comparison between Systemic Design and the other concepts could not be made. Please try a different search or restate your query differently.

HYPER-PARAMETER TUNING IN CODE

Your message >

: SystemiX App :

Your Personal Systemic Design Assistant

Empowering conversations on Systems Innovation, Systems Theory and Systems Thinking with this intuitive chatbot

Hi! I'm here to help you on above topics with vast database

You:

This corpus is about what?

This corpus is about systems innovation, a new approach to enabling change within complex systems. It emphasizes the importance of coordination and synergy among diverse actors within a system, aiming to create new platforms and ecosystems that align these actors in synergistic ways [Citation][Citation]. The corpus discusses the development of new ways of organizing people, networks, or platforms, requiring a compelling narrative to attract members [Citation][Citation][Citation]. It also touches on the importance of understanding the economy of ecosystems to create the right business model and incentives [Citation]. Furthermore, it highlights the need for a paradigm shift in assessing system change, focusing on changes in structure rather than parts [Citation]. Lastly, it provides a practical example of systems innovation in action, with a case study of a decentralized water system in a city [Citation]. The corpus also includes a guide to help people start their journey into systems innovation [Citation].

Your message



"FACTUAL_CONSISTENCY_SCORE": TRUE

My Question to this bot was "This corpus is about what?"

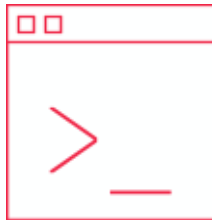
Validated the answer as Human in the Loop:

This corpus is about systems innovation, a new approach to enabling change within complex systems. It emphasizes the importance of coordination and synergy among diverse actors within a system, aiming to create new platforms and ecosystems that align these actors in synergistic ways [Citation] [Citation]. The corpus discusses the development of new ways of organizing people, networks, or platforms, requiring a compelling narrative to attract members [Citation] [Citation] [Citation]. It also touches on the importance of understanding the economy of ecosystems to create the right business model and incentives [Citation]. Furthermore, it highlights the need for a paradigm shift in assessing system change, focusing on changes in structure rather than parts [Citation]. Lastly, it provides a practical example of systems innovation in action, with a case study of a decentralized water system in a city [Citation]. The corpus also includes a guide to help people start their journey into systems innovation [Citation].

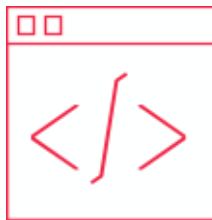
(see the screenshot of this interaction on the left)

STRUCTURE OF THE CODE & UI

Behind the Code: Insights into
the Development of this App



1. `[1 , 2]`
 2. `[...]`
 3. `One line comments: //`
-



1. `[1 , 2]`
 2. `[...]`
 3. `One line comments: //`
-

```
19 def submit_query(self, query_str: str):
99     for match in matches:
100         start, end = match
101         response_num = int(summary[start+1:end-1])
102         doc_num = responses[response_num-1]['documentIndex']
103         metadata = {item['name']: item['value'] for item in docs[doc_num]['metadata']}
104         text = extract_between_tags(responses[response_num-1]['text'], start_tag, end_tag)
105         if 'url' in metadata.keys():
106             url = f"#{metadata['url']}#:~:text={quote(text)}"
107             if url not in refs:
108                 refs.append(url)
109
110     # replace references with markdown links
111     refs_dict = {url:(inx+1) for inx,url in enumerate(refs)}
112     for match in reversed(matches):
113         start, end = match
114         response_num = int(summary[start+1:end-1])
115         doc_num = responses[response_num-1]['documentIndex']
116         metadata = {item['name']: item['value'] for item in docs[doc_num]['metadata']}
117         text = extract_between_tags(responses[response_num-1]['text'], start_tag, end_tag)
118         url = f"#{metadata['url']}#:~:text={quote(text)}"
```

PROBLEMS OUTPUT DEBUG CONSOLE **TERMINAL** PORTS

```
3.4/3.4 MB 5.3 MB/s eta 0:00:00
Downloading altair-5.3.0-py3-none-any.whl (857 kB)
857.8/857.8 kB 5.8 MB/s eta 0:00:00
Downloading blinker-1.7.0-py3-none-any.whl (13 kB)
Downloading cachetools-5.3.3-py3-none-any.whl (9.3 kB)
Using cached click-8.1.7-py3-none-any.whl (97 kB)
Downloading GitPython-3.1.43-py3-none-any.whl (207 kB)
207.3/207.3 kB 6.4 MB/s eta 0:00:00
Downloading numpy-1.26.4-cp311-cp311-macosx_11_0_arm64.whl (14.0 MB)
14.0/14.0 MB 5.6 MB/s eta 0:00:00
Downloading pandas-2.2.2-cp311-cp311-macosx_11_0_arm64.whl (11.3 MB)
11.3/11.3 MB 5.8 MB/s eta 0:00:00
Downloading protobuf-4.25.3-cp37-abi3-macosx_10_9_universal2.whl (394 kB)
394.2/394.2 kB 5.7 MB/s eta 0:00:00
Downloading pyarrow-15.0.2-cp311-cp311-macosx_11_0_arm64.whl (24.2 MB)
24.2/24.2 MB 6.0 MB/s eta 0:00:00
Downloading pydeck-0.8.1b0-py2.py3-none-any.whl (4.8 MB)
4.8/4.8 MB 4.0 MB/s eta 0:00:00
Downloading rich-13.7.1-py3-none-any.whl (240 kB)
240.7/240.7 kB 4.5 MB/s eta 0:00:00
Downloading tenacity-8.2.3-py3-none-any.whl (24 kB)
Downloading tornado-6.4-cp38-abi3-macosx_10_9_universal2.whl (433 kB)
433.1/433.1 kB 5.1 MB/s eta 0:00:00
Using cached typing_extensions-4.11.0-py3-none-any.whl (34 kB)
Downloading gitdb-4.0.11-py3-none-any.whl (62 kB)
62.7/62.7 kB 5.1 MB/s eta 0:00:00
Using cached Jinja2-3.1.3-py3-none-any.whl (133 kB)
Downloading jsonschema-4.21.1-py3-none-any.whl (85 kB)
85.5/85.5 kB 7.0 MB/s eta 0:00:00
Downloading markdown-it-py-3.0.0-py3-none-any.whl (87 kB)
87.5/87.5 kB 5.5 MB/s eta 0:00:00
Downloading pygments-2.17.2-py3-none-any.whl (1.2 MB)
1.2/1.2 MB 5.5 MB/s eta 0:00:00
Using cached python_dateutil-2.9.0.post0-py2.py3-none-any.whl (229 kB)
Using cached pytz-2024.1-py2.py3-none-any.whl (505 kB)
Using cached tzdata-2024.1-py2.py3-none-any.whl (345 kB)
Downloading toolz-0.12.1-py3-none-any.whl (56 kB)
56.1/56.1 kB 4.3 MB/s eta 0:00:00
Using cached attrs-23.2.0-py3-none-any.whl (60 kB)
Downloading jsonschema_specifications-2023.12.1-py3-none-any.whl (18 kB)
Downloading MarkupSafe-2.1.5-cp311-cp311-macosx_10_9_universal2.whl (18 kB)
Downloading mdurl-0.1.2-py3-none-any.whl (10.0 kB)
Downloading referencing-0.34.0-py3-none-any.whl (26 kB)
Downloading rpds_py-0.18.0-cp311-cp311-macosx_11_0_arm64.whl (330 kB)
330.8/330.8 kB 5.6 MB/s eta 0:00:00
Using cached six-1.16.0-py2.py3-none-any.whl (11 kB)
Downloading smmap-5.0.1-py3-none-any.whl (24 kB)
Installing collected packages: pytz, tzdata, typing-extensions, tornado, toolz, tenacity, smmap, six, rpds-
util, pyarrow, markdown-it-py, jinja2, gitdb, rich, pydeck, pandas, jsonschema-specifications, gitpython,
Successfully installed MarkupSafe-2.1.5 altair-5.3.0 attrs-23.2.0 blinker-1.7.0 cachetools-5.3.3 click-8.1
0.0 mdurl-0.1.2 numpy-1.26.4 pandas-2.2.2 pillow-10.3.0 protobuf-4.25.3 pyarrow-15.0.2 pydeck-0.8.1b0 pygm
0.1 streamlit-1.33.0 tenacity-8.2.3 toolz-0.12.1 tornado-6.4 typing-extensions-4.11.0 tzdata-2024.1
(paulvenv) (base) universepaul@PAULS-16MacBook-Pro RAG-chat-vectara %
```

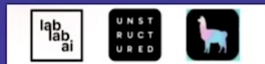
```
vRAGquery.py > RAGQueryVect > promptquery
class RAGQueryVect():
    def promptquery(self, query_str: str):
5/         'summary': l
58         {
59             'responseLang': 'eng',
60             'maxSummarizedResults': 9,
61             'summarizerPromptName': self.prompt_name, #optional - default to best summarizer with acc type
62             'chat': {
63                 'store': True,
64                 'conversationId': self.conv_id
65             },
66             'debug': True,
67             "factual_consistency_score": True
68         },
69     ],
70 },
71 ],
72 },
73 },
74 },
75 },
76 response = requests.post(endpoint, data=json.dumps(body), verify=True, headers=headers)
77 if response.status_code != 200:
78     print(f"Query failed with code {response.status_code}, reason {response.reason}, text {response.text}")
79     return "Sorry, something went wrong in my little brain. Please try again later."
80
81 res = response.json()
82 print(res)
83
84 top_k = 11
85 summary = res['responseSet'][0]['summary'][0]['text']
86 responses = res['responseSet'][0]['response'][:top_k]
87 docs = res['responseSet'][0]['document']
88 chat = res['responseSet'][0]['summary'][0]['chat']
89 print(summary)
90
91 if chat is not None and chat['status'] != None:
92     st_code = chat['status']
93     print(f"Chat query failed with code {st_code}")
94     # ... rest of your code handling chat failure
95     if st_code == 'RESOURCE_EXHAUSTED':
96         self.conv_id = None
97         return 'Sorry, Vectara chat turns exceeds plan limit.'
98     return 'Sorry, something went wrong in my little brain. Please try again later.'
99 elif 'responseSet' in res and res['responseSet'] and len(res['responseSet']) > 0:
```

PROBLEMS OUTPUT DEBUG CONSOLE **TERMINAL** PORTS

```
(paulvenv) (base) universepaul@PAULS-16MacBook-Pro RAG-chat-paulvectara % streamlit run vRAGapp.py
2024-04-19 15:18:55.460 "server.python" is not a valid config option. If you previously had this config option set, it may have been removed.
2024-04-19 15:18:55.460 "theme.gatherUsageStats" is not a valid config option. If you previously had this config option set, it may have been removed.

You can now view your Streamlit app in your browser.

Local URL: http://localhost:8502
```



RAG based SystemiX Bot

This app uses AI Retrieval Augmented Generation to index and query from an uploaded corpus at Vectara database

Swift Snapshot

During an International Hackathon by Lablab.AI, the mission was to develop advanced RAG apps and chatbots, integrating cutting-edge technologies such as Vectara, LlamaIndex, Together AI, and Unstructured.io.

Utilizing Vectara's Indexing API, I seamlessly imported data into a Vectara corpus.

This app leverages the Vectara Chat API to efficiently retrieve information from the corpus, providing accurate responses to your inquiries.

Empowering conversations on Systems Thinking, Systems Theory and Systems Innovation with this intuitive chatbot

- + What are the Key Dimensions to Systems Innovation? + What is Systems Mapping?
- + Confused about Systems Thinking, Systems Theory, Systemic Design, Systems Thinking and Systems Innovation?
- + What are Systems Design Principles? + How Systemic Design related to design thinking?
- + What we can know from Mexico City Water System? + Teach me Systems Thoery
- + What are the Systemic Design Principles for Complex Social Systems?
- + Guide me using Systemic Design Toolkit.

Some examples to click. OR Type ur Qs inside the bottom prompt bar

Hi! Ask me to help you from broad database on above topics

Confused about Systems Thinking, Systems Theory, Systemic Design, Systems Thinking and Systems Innovation?

You:
What are Systems Design Principles?

SystemiX Bot:
Systems Design Principles are foundational concepts that guide design choices, particularly when dealing with complex systems [Citation][Citation][Citation]. These principles derive from the nature of the systems being designed and should align with desired outcomes [Citation][Citation][Citation]. The advent of information technology and connectivity has led to increasingly complex systems, necessitating a new set of design principles [Citation][Citation]. These principles are applied in designing "ecosystems" of interacting elements that evolve, requiring a holistic approach to design [Citation][Citation][Citation].

In the context of social and complex systems, design principles provide theoretically-sound guidance [Citation]. They are drawn from systems theory and offer a foundation for practitioners to enhance engagement and evolve better practices [Citation][Citation]. They enable new forms of design, planning, and deliberative conversation for coordinated action [Citation].

In summary, Systems Design Principles guide the design of complex systems, considering their nature and desired outcomes, and are crucial in the era of complex, evolving "ecosystems". They are also key in social and complex systems design, providing a theoretical foundation for better practices [Citation][Citation][Citation]

Type "What are Systems Design Principles?" here

:: SystemiX Bot ::

Your Personal Assistant on Systems Innovation

Sparking short conversations on Systems Thinking, Systems Theory, Systemic Deesign and Systems Innovation with this responsive chatbot based on your particular data

- + Confused about Systems Innovation, Systems Thinking, Systems Theory, Systemic Design, and Design Thinking?
- + Teach me Systemic Design of Socio-technical Systems? + Systemic Design Toolkit's methodology activity
- + What are Systems Design Principles? + How Systemic Design related to design thinking?
- + What are the Key Dimensions to Systems Innovation? + What is Systems Mapping?
- + What we can know from Mexico City Water System? + Teach me Systems Thoery
- + What are the Systemic Design Principles for Complex Social Systems?

Some examples above to click. OR Type your Qs inside the input bar at bottom

Hi! Ask me to help you briefly on above topics around complex systems!

You:
Confused about Systems Innovation, Systems Thinking, Systems Theory, Systemic Design, and Design Thinking?

SystemiX Bot:
Sorry, something went wrong in my little brain. Please try again later.

Type "Confused about Systems innovation, Systems Thinking, Systems Theory, Systemic" >



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- + What we can know from Mexico City Water System? + Teach me Systems Theory
- + What are the Systemic Design Principles for Complex Social Systems?
- + Guide me using Systemic Design Toolkit.

Some examples to click. OR Type ur Qs inside the bottom prompt bar

Hi! Ask me to help you from broad database on above topics

How Systemic Design related to design thinking?

Systemic design is a synthesis of systems thinking and design thinking, integrating these two fields to address complex challenges characterized by complexity, uniqueness, value conflict, and ambiguity over objectives [Citation]. It is distinguished from user-oriented and service design practices by its expansion and negotiation of system boundaries, intentional embrace of sociotechnical complexity, and strategies of systemic integration [Citation]. As design thinking was extended to the field of management, it encountered "wicked problems" and realized the need to become systemic, integrating good theory and practices of systemic design [Citation]. Systemic design brings human-centered design to complex, multi-stakeholder service systems, adapting from known design competencies to describe, map, propose, and reconfigure complex services and systems [Citation]. It allows practitioners to select the variants of systems thinking and design thinking that fit their particular challenge [Citation].

What is this bot about?

THE TEAM



< **github: replyPaul** >

PAUL BISWA

AI Product Architect

(for this hackathon challenge)

Newbie in AI ..from Dec 2023

GenAI/LLM/CV Enthusiast;

AI Engineer;

Design Practitioner and
Technical Consultant

App was made during a Hackathon by LabLab.AI - April 2024

THANK YOU!
FOR YOUR TIME &
MY OPPORTUNITY

:: SYSTEMIX BOT ::