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DWAI – AN AI POWERED CHATBOT

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ABSTRACT
DWAI (Data Wranglers AI) is an intelligent chatbot that is designed to enhance the way users retrieve information. DWAI uses LangChain and Generative AI models such as GPT. The chatbot uses the Google API to produce instant, context-relevant responses. DWAI is distinct from traditional search engines or basic chatbots since it can search globally by fetching information from various online sources. This makes it an instant and interactive method of retrieving information in most fields.
The chatbot is designed to work seamlessly with the Data Wranglers Club website of JBIET. It provides students, teachers, and visitors with easy access to a great amount of global knowledge. It can answer natural language questions and give proper, real-time answers from a large number of information sources. DWAI is designed with Streamlit, making it simple for users to interact. users of various technical skills.

Keywords:
DWAI (Data Wranglers AI), Intelligent chatbot, LangChain, Generative AI, GPT, Google API, Context-relevant responses, Online information retrieval, Interactive search.

INTRODUCTION

DWAI (Data Wranglers Artificial Intelligence) is an intelligent chatbot developed with the help of LangChain, Google API, and Streamlit. It is suitable for global search and gives live responses based on AI by pulling and processing information from various online sources. As compared to usual chatbots that can only offer predefined responses, datasets assist DWAI in retrieving pertinent content, making it a powerful tool for researching a vast range of subjects. By linking DWAI to Data Wranglers Club of JBIET's official website, this project aims to demonstrate what LLMs and Generative AI can do in providing precise and current information. With its easy-to-use interface and powerful search functionality, DWAI shows enhancement in using AI for searching and retrieving information.

OBJECTIVES

The main objectives of DWAI are:

1. Develop an intelligent chatbot with LangChain, Google API, and Generative AI - The chatbot will provide real-time, precise, and helpful search results from across the globe.
2. Facilitate Dynamic and Context-Aware Responses – Make DWAI dynamically retrieve and process varied information, instead of using a pre-defined dataset.
3. Seamless Integration with the Data Wranglers Website – Deploy DWAI on the official Data Wranglers JBIET website, making it easily accessible to students and faculty.
4. Enhance User Interaction with AI – Utilize Streamlit to develop an easy and intuitive interface, whereby users can interact with DWAI with ease.
5. Enhance Information Accessibility – Provide a fast and AI-powered alternative to conventional search engines by providing filtered, relevant, and well-formatted answers.
6. Demonstrate the capabilities of Generative AI – Demonstrate how LLMs and AI-driven search models can optimize information discovery and enhance user experience.

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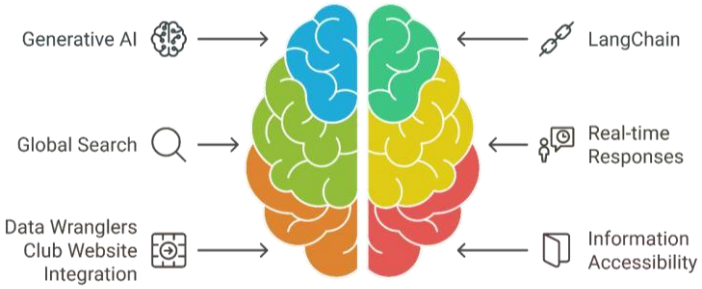

LITERATURE REVIEW

The creation of smart chatbots using Generative AI has been a prominent area of research in recent years. This research has played a key role in improving the way users interact, seek information, and make decisions. The following review summarizes major research and advancements in areas that have shaped the way the DWAI project is developed and carried out.

1. Generative AI and Large Language Models (LLMs):

Large Language Models (LLMs) like GPT-3, ChatGPT, and BERT have transformed the way machines communicate with and produce human-like text. Radford et al. (2019) state that the GPT series is very effective in natural language understanding and generation, which is helpful in developing chatbots, virtual assistants, and content. The models use deep learning methods to analyze a lot of text data and produce responses that are contextually accurate and readable. The creation of Generative AI proves that it can process many diverse questions, and it is helpful all over the world.

search systems like DWAI.

2. LangChain: A Framework for Language Models:

LangChain, which aims to simplify the integration of LLMs with other applications, has been the primary driver of chatbot capability improvement through the facilitation of dynamic information retrieval. For Chen et al. (2021), LangChain makes it easy to integrate LLMs with APIs, databases, and web scrapers and is thus best applied in developing sophisticated applications such as DWAI, where global search capability is critical. The system facilitates the integration of various data sources, allowing the chatbot to respond in a context-sensitive manner.

3. Global Search in AI systems:

The idea of global search in AI has been studied for knowledge management, information retrieval, and realtime query processing. The majority of current AI systems, including Google's search engine, use algorithms to sift through vast quantities of internet data to present relevant search results. based on user queries. Cormack et al. (2020) explain how advanced retrieval techniques, like semantic search and natural language search, significantly improve the quality of results retrieved. DWAI does the same by conducting global searches of various data repositories and producing responses that are semantically close to the user query.

4. Chatbots in Schools:

Chatbots are increasingly being utilized in schools to enhance learning and assist with administrative tasks. According to a study conducted by Kearns and Rosé (2016), AI chatbots can behave like personal tutors, facilitating learning of students by responding to questions, providing feedback, and recommending additional resources. DWAI's implementation to the Data Wranglers Club website of JBIET is one such application, where the chatbot is meant to enable greater access to global information, which assists students in studies and after-school activities.

5. Streamlit for Web Interfaces that Interact:

Streamlit has emerged as an in-demand utility for rapidly developing interactive web applications with minimal effort, particularly for data science and AI applications. In the Streamlit documentation (2022), it is claimed that

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it allows developers to create user-friendly interfaces with minimal code, ideal for demonstrating AI-powered applications such as DWAI. One of the primary reasons Streamlit is used widely in AI development, particularly when fast turnaround and minimal user interaction are critical, is the potential to rapidly deploy prototypes and scale them for use in production.

6. AI Chatbots in Customer Service and Industry Applications:

Implementing AI chatbots in customer service and other applications is already prevalent. A study by Gnewuch et al. (2017) indicates that intelligent chatbots can reply to customers to their satisfaction, provide information, and resolve problems on time. In DWAI, the same study proves that an
A smart chatbot has the capability to assist schools, businesses, and government institutions by giving relevant and up-to-date information to the users. This is possible through its capability to search globally and provide the right answer, thus making DWAI adaptive.to other fields.

7. Issues in AI-Based Search Systems:

While there has been advancement, issues in maintaining accuracy, relevancy, and real-time processing of information in AI-based systems remain. Yao et al. (2021) carried out research based on contextual comprehension and multi-source data fusion in search systems. For DWAI, solving such issues is It should be important for the chatbot to be in a position where it can extract meaningful information, understand what is sought by the user, and supply correct information from various resources.

REQUIREMENT ANALYSIS

Hardware requirements:

1. Server/Hosting:

A local server or a cloud server to execute the chatbot application and handle the API requests.

- Required server specs:
▪ Processor: Multi-core CPU (For example, Intel i5 or higher)
▪ RAM: 8 GB at least
▪ Storage: 100 GB or larger (based on the magnitude of data being managed.
▪ Internet Connection: Broadband internet for real-time data access and cloud interactions.

2. User Devices:

Desktops/Laptops: The users may engage with the chatbot using web browsers. ▪
Operating System: Windows, macOS, or Linux
▪ Browser: Google Chrome, Mozilla Firefox, Safari, etc.
▪ RAM: At least 4 GB

Mobile Devices: The system must be available on tablets or smartphones.
▪ Operating System: Android or iOS
▪ Internet Connection: A stable internet connection for smooth interaction

Software requirements:

1. Operating System:
▪ Windows, macOS, or Linux (for development environment and server hosting

2. Programming Languages:
▪ Python is employed to write the backend and add APIs, LLMs, and NLP Models.

3. Web Development Framework:
▪ Streamlit is utilized to build the interactive front end of the chatbot.

4. AI and Machine Learning Libraries:
▪ LangChain for bridging LLMs with external APIs and data sources.
▪ Transformers (Hugging Face) for applying pre-trained models such as GPT to NLP activities.
▪ PyTorch/TensorFlow for training and fine-tuning the NLP models (if necessary).

5. Third-Party APIs and Cloud Services:
▪ Google Cloud API for worldwide search and real-time data access.
▪ Web scraping APIs (like BeautifulSoup and Scrapy) are used to get data from websites (if necessary).
▪ Natural Language Processing (NLP) APIs assist in managing user queries (e.g. OpenAI, GPT)

6. Database (if required):

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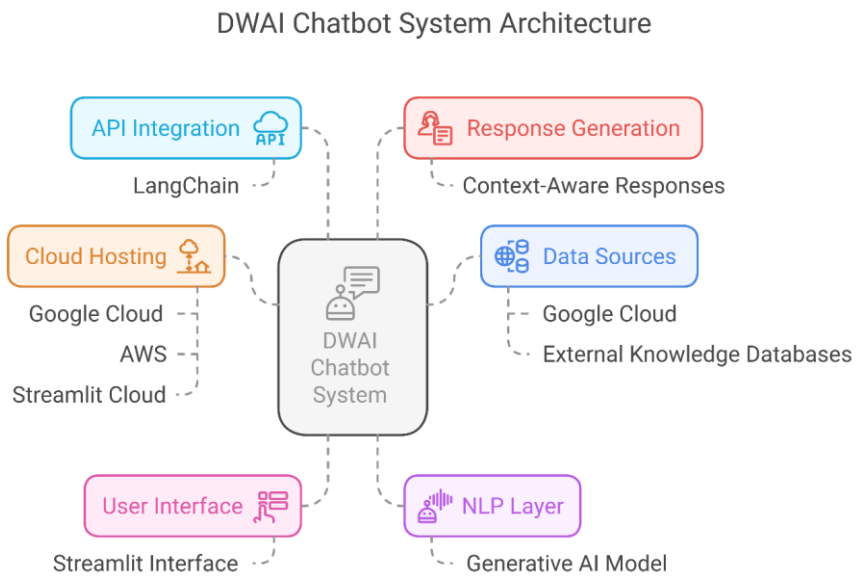
- Keep logs, user information (if necessary), and the chatbot in SQLite or MySQL answers.
- Cloud Databases (Google Firebase, AWS) for real-time storage (optional)

7. Version Control:
   - Git for collaborative development and version control.
   - GitHub or GitLab to host code and version control.
8. Web Host/Deployment:
   - You may host the application online using Heroku, AWS, or Google Cloud Platform.
9. Security and Privacy tools:
   - SSL Certificates assist in securing HTTPS connections.
   - Authenticate users through OAuth (if necessary).
   - JWT (JSON Web Tokens) facilitates the security of sessions.



IMPLEMENTATION

To build DWAI (Data Wranglers Artificial Intelligence) as a live AI-powered chatbot, there has been a strategy of implementation. The main elements of such implementation are listed below.

1. Large Language Model (LLM) Integration:

The core of DWAI employs a highly sophisticated Large Language Model (LLM) that is utilized to generate intelligent and context-sensitive responses. The model communicates with LangChain, which enables smooth interaction, handling prompts, and enhancing responses. Through with Generative AI, DWAI provides superior, responsive answers that extend beyond read-only, pre-existing data sets.

2. Real-Time Information Retrieval:

To provide timely and relevant answers, DWAI employs real-time web search through the Google API. This provides the chatbot with access to the latest data from various internet sources, hence providing up-to-date and relevant answers. There is also the use of a technique called Retrieval-Augmented Generation (RAG) for enhancing answers through the aggregation of retrieved data.
with generative AI outputs.

3. User Interface and Interaction:

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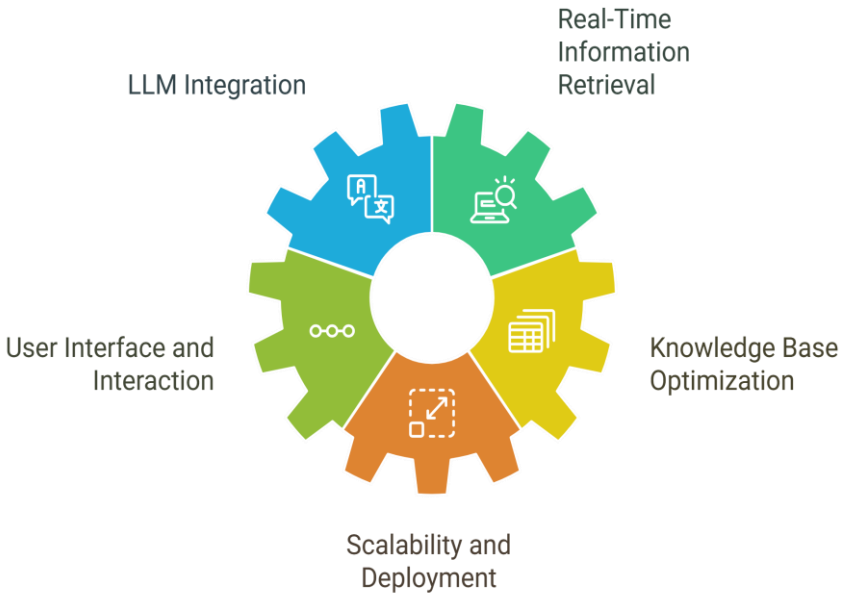
The chatbot is implemented with a minimal and interactive interface using Streamlit. This is highly responsive and user-friendly. There are also content filters to make sure that the data fetched is reliable, relevant, and matching user queries.

4. Knowledge Base Optimization (Optional Enhancement):

To improve searching and assist users in the future, DWAI can employ a vector database such as ChromaDB or FAISS. This assists in storing and structuring information that individuals search for frequently, resulting in more accurate answers for similar questions. Conversational memory is also incorporated to maintain context clear during various conversations with users.

5. Scalability and Deployment:

In being scalable and user-friendly, DWAI is cloud-hosted. This provides convenient access through the official website of the Data Wranglers Club at JBIET. It is scalable as a chatbot with capabilities allowing it to integrate through APIs. it to be integrated into different platforms and applications whenever the need is there. With the systematic method of getting things done, DWAI clearly shows The ability of Generative AI and Large Language Models facilitates quick discovery of information. This renders AI insights more accessible and convenient to users.



RESULTS AND DISCUSSION

The DWAI (Data Wranglers Artificial Intelligence) bot, based on Google Gemini 2.0 through LangChain, offers live, context-specific responses in a variety of subjects, ranging from general knowledge and Data Wranglers operations. The platform efficiently handles several users at the same time, reflecting high scalability and responsiveness. The Streamlit UI has been optimized for use with multi-language aid expanding its international scope.

- Generative AI and APIs provide real-time access to knowledge, with responses kept current and accurate. LangChain enhances contextual comprehension, providing an enriched user experience. Data protection regulations and end-to-end encryption preserve data confidentiality.

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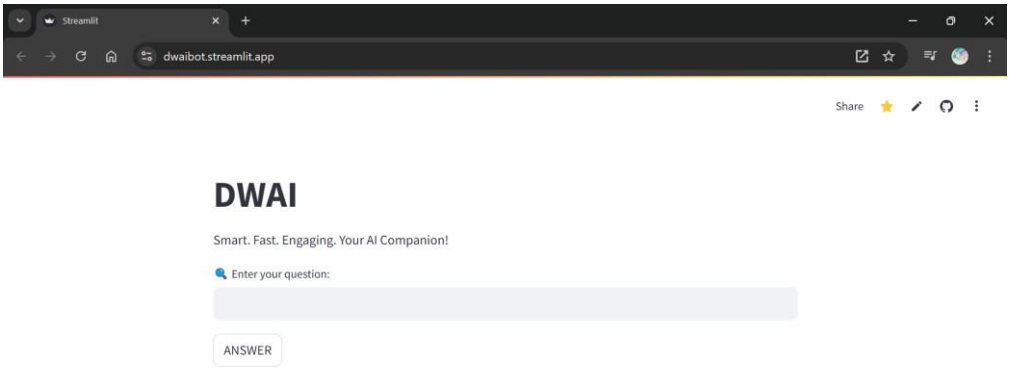
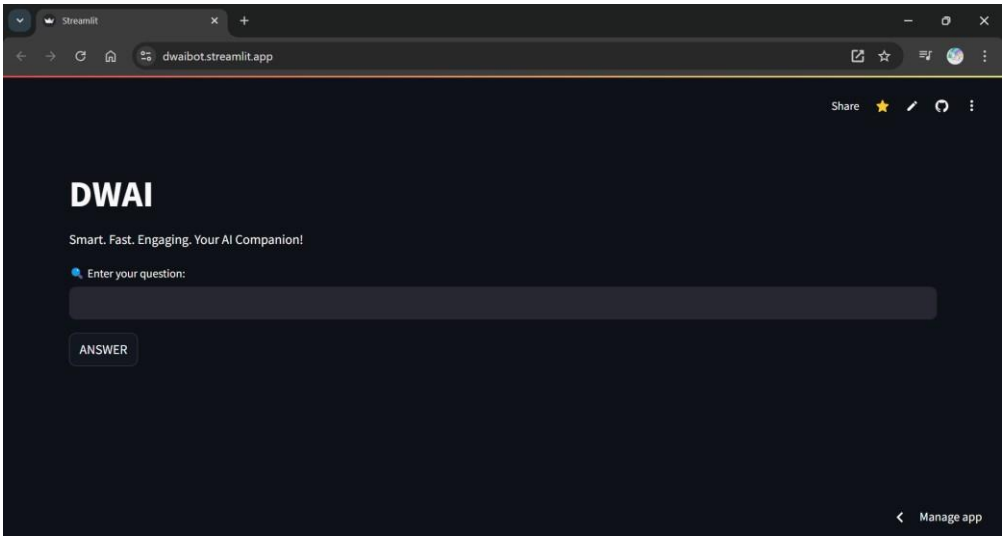
- Ambiguous questions and third-party API usage are issues that could influence the system's reliability in times of downtime. Improvements in the future involve broadening knowledge sources, introducing personalization elements, and scalability for increased users.
- Overall, DWAI shows that AI-driven chatbots can be useful, with a good base for future improvements.





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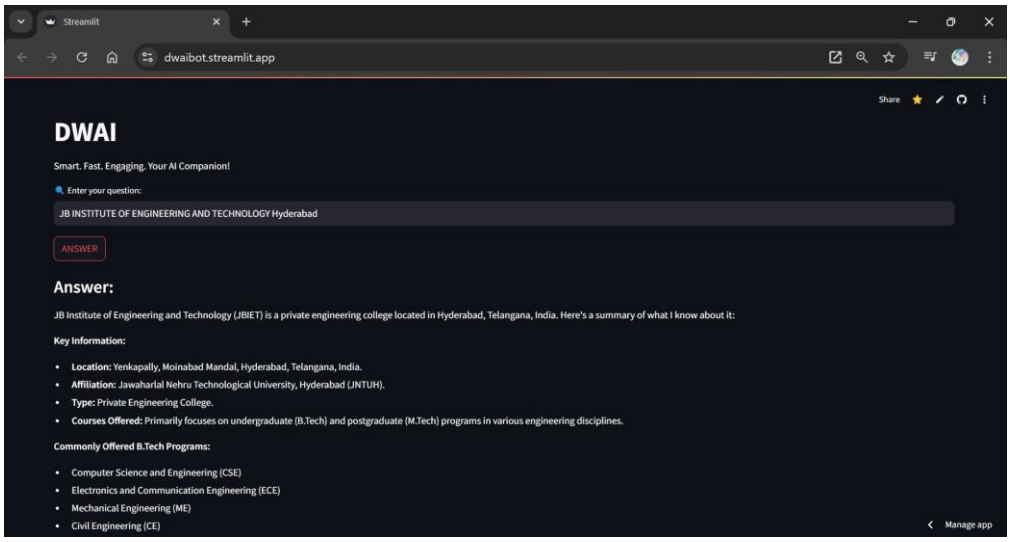

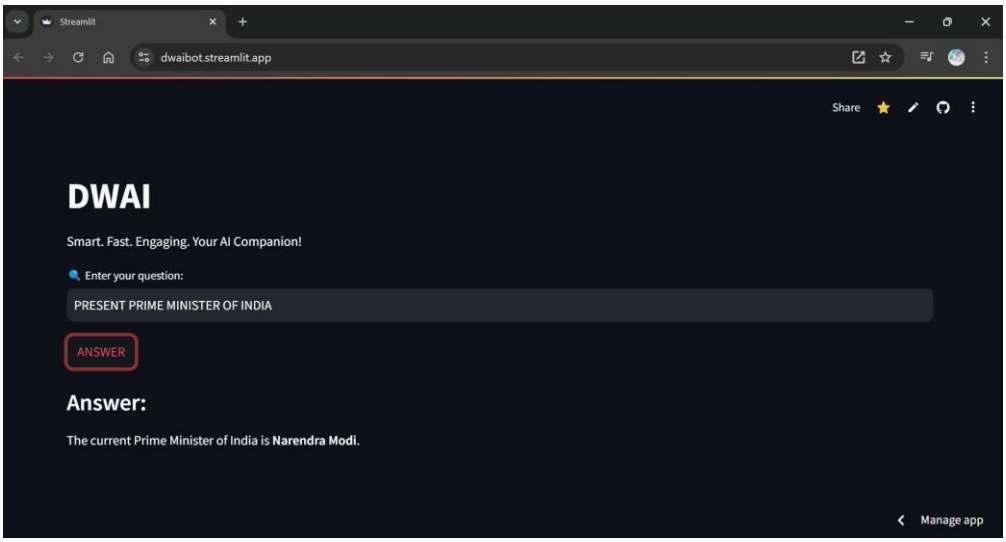

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CONCLUSION

The DWAI (Data Wranglers Artificial Intelligence) bot is a breakthrough in leveraging Generative AI and LangChain technologies to deliver fast, context-based answers. It integrates Google Gemini 2.0 and leverages Streamlit for user-friendliness, the chatbot provides accurate, dynamic, and relevant answers to a wide range of topics from general information and technology.

The project has been able to fulfill the requirement of efficient, scalable, and secure information retrieval systems for global as well as local users. Support for various languages supported by the system and the easy-to-use interface make it a potent tool for gaining and sharing knowledge.

The project also revealed areas to be enhanced specifically for handling special case scenarios and making fewer external APIs to retrieve real-time data. Those external APIs do sometimes create issues such as outages or limited services. Improving by increasing the chatbot's ability to handle complex questions and by including more information sources, we can make it stronger.

In short, the DWAI chatbot is a great platform to construct the future of AI-driven interactive systems on. With continuous optimization and addition, it can be developed into an even more competent, reliable, and personalized method of interaction for users in other areas.

REFERENCES

Books and Research Papers:

[1] Vaswani, A., et al. (2017) – Attention Is All You Need (Research on Transformer model).
[2] Goodfellow, I., Bengio, Y., & Courville, A. (2016) – Deep Learning (MIT Press).
[3] Jurafsky, D., & Martin, J. (2021) – Speech and Language Processing (NLP concepts).
[4] Bishop, C. M. (2006) – Pattern Recognition and Machine Learning (Concepts of AI and ML).

Web Sources and Documents:

[1] LangChain Documentation – https://python.langchain.com (chaining of AI models).
[2] Google Cloud API Documentation – https://cloud.google.com/apis (API integration).
[3] Streamlit Documentation – https://docs.streamlit.io (Frontend development).
[4] OpenAI GPT Documentation – https://platform.openai.com/docs (Generative AI technology).

[5] AWS & Google Cloud Hosting Guides – https://aws.amazon.com https://cloud.google.com (Cloud deployment).

Online Lessons & Classes:

[1] Coursera – Deep Learning Specialization (By Andrew Ng).
[2] Udacity AI Programming with Python (AI chatbot development). [3] YouTube Channels:
- Data School (NLP and AI models).
- Sentdex (Python AI and chatbot tutorials).

Technical Reports and Articles:

[1] MIT AI Research Publications – https://news.mit.edu/topic/artificialintelligence
[2] IEEE Xplore Digital Library – Articles on AI-driven chatbot system (https://ieeexplore.ieee.org). [3] ArXiv Preprints – Recent advances in NLP and LangChain application (https://arxiv.org)

INTERNAL GUIDE

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