International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 09 Issue: 01 | Jan - 2025 SJIF Rating: 8.448 ISSN: 2582-3930

BRIEF-DOC A MULTI PDF WEB APPLICATION

CH. SUBBAREDDY[1] ,K. JHANSI[2], M. RAGHU VARNA[3], S. PRAVEEN[4], D. VAZEER HUSSAIN[5]

[1] *CH. SUBBAREDDY (assistant professor)*
[2]*K.Jhansi Department of Computer Science and Engineering (Joginpally B.R Engineering College)*
[3] *M.Raghu varna Department of Computer Science and Engineering (Joginpally B.R Engineering College)*
[4] *S.Praveen Department of Computer Science and Engineering (Joginpally B.R Engineering College)*
[5]*D.Vazeer hussain Department of Computer Science and Engineering (Joginpally B.R Engineering College)*

Abstract - In today's fast-paced digital landscape, the sheer volume of information in PDF documents can be overwhelming and time-consuming to process. This presentation introduces an innovative system that leverages natural language processing (NLP) and voice-assistive technology to create a comprehensive PDF summarizer equipped with a voice assistant. The system not only extracts key points from lengthy PDFs, condensing them into easily digestible summaries, but also features a language-changing option that allows users to select their preferred language for both text and audio output. Users can listen to these summaries read aloud through the voice assistant, ensuring a hands-free and efficient way to stay informed. This technology is especially beneficial for professionals, students, and researchers who require quick insights without the need to read entire documents.

Key features include:

- Automatic text extraction and summarization.
- Customizable summary lengths tailored to user preferences.
- Integration with voice assistants for real-time, audible summaries.
- Language selection for both text and audio output, accommodating diverse user needs.
- Versatile applications across education, business, and research sectors.

1.INTRODUCTION

BriefDoc is an advanced PDF summarizer designed to deliver precise and relevant answers from documents based on user queries. Users can input their questions in two formats: text and audio. The system processes the PDF content and provides responses in both text and audio formats, ensuring flexibility and convenience. Notably, BriefDoc incorporates a language-changing feature, allowing users to select their preferred language for both the text and audio outputs. This enhances accessibility and caters to a diverse audience. By tailoring the summarization to the specific questions posed, BriefDoc significantly improves the efficiency of information retrieval, making it an ideal solution for users seeking quick access to relevant insights from lengthy PDFs.

1.1 KEY OBJECTIVES :

Precise Summarization: Generate accurate and relevant answers from PDF documents based on user queries.

Multi-format Input: Allow users to input queries in both **text and audio** formats for flexibility.

Efficient Information Retrieval: Summarize and deliver information tailored to the specific questions, improving the speed and accuracy of retrieving relevant insights.

Multi-format Output: Provide answers in both **text and audio** formats to enhance user convenience.

User Convenience and Flexibility: Ensure easy access to relevant information from large or complex PDF documents, making it more efficient for users to extract insights.

1.2 PROJECT OUTCOMES :

Advanced Summarization Engine: Successfully developed a system that processes lengthy PDF documents to provide concise and relevant answers based on user queries.

Multi-format Query Input: Implemented functionality allowing users to submit queries via both **text** and **audio**, enhancing accessibility and user interaction.

Dual Output Format: Delivered query-based answers in both **text** and **audio** formats, offering flexibility for users who prefer different modes of receiving information.

Efficient Information Retrieval: Optimized the tool for fast and accurate retrieval of key information from extensive documents, significantly reducing the time required to find relevant insights.

User-friendly Interface: Created a streamlined, intuitive interface that simplifies the process of uploading PDFs, submitting queries, and receiving answers, ensuring ease of use for both tech-savvy and non-technical users.

II.LITERATURE REVIEW

1. EXISTING SYSTEM :

The current PDF summarizer systems are mainly focused on text extraction and condensation from PDF documents using language processing (NLP) algorithms. These systems aim to provide concise summaries, helping users quickly grasp the key ideas without reading the entire document. Here are some of the core characteristics of existing PDF summarizers:

Text Extraction: They extract relevant sections of the document based on keyword frequency, topic modeling, and other NLP techniques.

Summarization: The extracted text is then summarized into short, cohesive paragraphs that represent the essential points of the document.

User Input: Many existing systems allow users to customize the summary length or specify sections of the document for focus.

No Audio Integration: These systems primarily function as text-based solutions, requiring users to read the generated summaries on their own.

Limited Interactivity: Interaction is limited to text-based interfaces with no voice or speech recognition features.

2. DRAWBACKS OF EXISTING SYSTEM :

Limited Accessibility

No Hands-Free Functionality

Lack of Real-Time Interaction

Inflexible Summarization

No Multimodal Learning

Cognitive Load and Fatigue

Limited Interaction in Mobile or Low-Screen Environments

3. Purpose of the application:

The purpose of the BriefDoc application is to streamline the process of extracting and summarizing information from PDF documents, providing users with quick and relevant answers based on their specific queries. Key objectives include:

Efficient Information Retrieval: By allowing users to input questions in both text and audio formats, BriefDoc enhances the speed and accuracy of information retrieval from lengthy documents.

User-Friendly Experience: The dual input options (text and audio) cater to different user preferences, making it easier for individuals to interact with the application.

Tailored Summarization: BriefDoc focuses on answering specific questions rather than providing generic summaries, ensuring that users receive concise and pertinent insights.

Flexibility in Output: By delivering answers in both text and audio formats, the application accommodates various user needs and contexts, promoting accessibility and convenience.

Support for Diverse Users: Whether for students, professionals, or researchers, BriefDoc serves as an ideal tool for anyone needing to quickly distill information from extensive PDFs.

Enhancing Productivity: By reducing the time spent searching for information, BriefDoc allows users to focus on analysis and decision-making rather than document navigation

III.RESEARCH METHODOLOGIES

Precise Summarization: Generate accurate and relevant answers from PDF documents based on user queries.

Multi-format Input: Allow users to input queries in both **text and audio** formats for flexibility.

Efficient Information Retrieval: Summarize and deliver information tailored to the specific questions, improving the speed and accuracy of retrieving relevant insights.

Multi-format Output: Provide answers in both **text and audio** formats to enhance user convenience.

User Convenience and Flexibility: Ensure easy access to relevant information from large or complex PDF documents, making it more efficient for users to extract insights

IV ALGORITHMS

Algorithm:

1. Text Preprocessing Algorithm

Algorithm: **Recursive Character Text Splitter**
Purpose: To prepare documents for processing by splitting them into smaller, manageable chunks.

- **Why it's used**: Large documents can overwhelm the system, and dividing them into smaller parts ensures better performance during text analysis.
- **How it works**:

- It recursively divides the text into smaller parts based on specific delimiters like sentences or paragraphs.
- Splitting ensures that the context of each section is preserved for accurate downstream processing.

- **Use case**: When analyzing lengthy documents or books, smaller chunks make searching and embedding faster and more efficient.

2. Text Embedding Algorithm

Algorithm: **GoogleGenerativeAIEmbeddings**
Purpose: To convert textual data into a numerical format (embeddings) that captures semantic meaning.

- **Why it's used**: Computers process numbers, not text. Embeddings translate text into vectors that reflect meaning, context, and relationships.
- **How it works**:
  - The algorithm uses a pre-trained generative AI model to map words, phrases, or sentences into a high-dimensional numerical space.
  - Words or phrases with similar meanings have embeddings that are close to each other in this space.
- **Use case**: Enables semantic search and similarity comparisons, such as finding related chunks of text in a document.

3. Vector Search Algorithm

Algorithm: **FAISS (Facebook AI Similarity Search)**
Purpose: To perform similarity-based searches for retrieving the most relevant text chunks.

- **Why it's used**: Efficiently retrieves information from a large set of embeddings based on their similarity.
- **How it works**:
  - Embeddings of text chunks are stored in a vector database.
  - When a query is embedded, FAISS compares it against the stored vectors and retrieves the most similar ones using distance metrics like cosine similarity or Euclidean distance.
- **Use case**: Identifies text chunks in the document that are most relevant to a user's question.

4. Question Answering Algorithm

Algorithm: **Google Generative AI**
Purpose: To understand questions and generate detailed, contextually accurate answers.

- **Why it's used**: Pre-trained generative models are excellent at natural language understanding and response generation.
- **How it works**:
  - The system takes a question as input and contextual information from the document.
  - The model generates a detailed and coherent answer by leveraging its knowledge and the provided context.
- **Use case**: Delivers precise answers to user queries using the retrieved relevant text chunks.

5. Machine Translation Algorithm

Algorithm: **Google Translate**
Purpose: To translate text responses into a language chosen by the user.

- **Why it's used**: Enhances accessibility for users who speak different languages.
- **How it works**:
  - The system sends the text to the Google Translate API.
  - The API processes the input text and returns the translated output.
- **Use case**: Helps in providing responses in the user's preferred language for a better user experience.

6. Speech Recognition Algorithm

Algorithm: **Google Speech API**
Purpose: To convert spoken questions into text for processing.

- **Why it's used**: Allows users to interact with the system using voice instead of typing.
- **How it works**:
  - The user's speech is captured and sent to the Speech API.
  - The API processes the audio, identifies spoken words, and converts them into textual format.
- **Use case**: Enables voice-based interaction for querying the system.

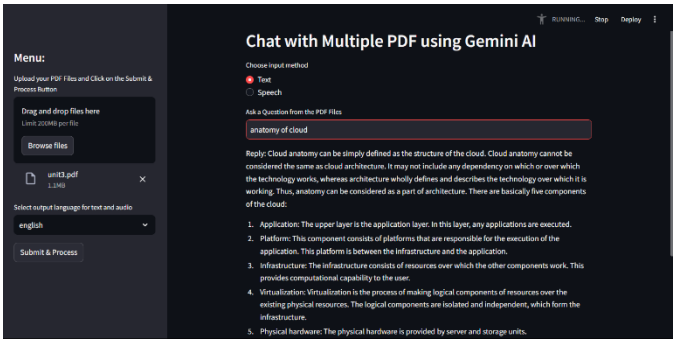
7. Text-to-Speech Algorithm

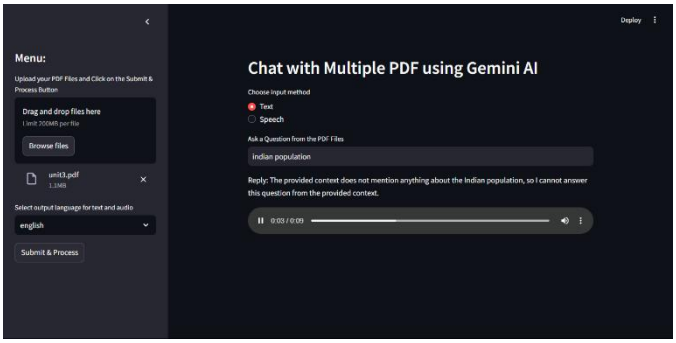
Algorithm: **gTTS (Google Text-to-Speech)**
Purpose: To convert textual responses into audio for users.

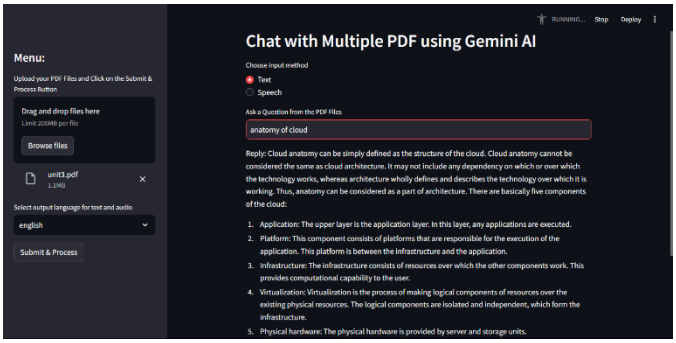
- **Why it's used**: Provides a voice output for users who prefer listening over reading.
- **How it works**:
  - The system generates an audio file by passing the text to the gTTS library.
  - The audio file is played back to the user.

Use case: Delivers voice-based answers, enhancing the system's usability and accessibility.

RESULTS:







3. CONCLUSIONS

BriefDoc stands out as an innovative PDF summarizer that streamlines the process of information retrieval. By enabling users to ask questions in both text and audio formats, it offers a versatile and user-friendly experience. The tool's ability to provide tailored answers enhances efficiency, making it an essential resource for anyone seeking quick and relevant insights from extensive documents. With BriefDoc, users can effortlessly navigate complex information, ensuring they make the most of their time and resource.

.

REFERENCES

1. Prompt Engineer YouYube channel video name is ' Langchain PDF Chat App (GUI) | Chatgpt for Your PDF FILES | Step-by-step Tutorial' which was posted on May 19,2023.