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## Review Article

# Enhancing PDF interaction for a more engaging user experience in library: Introducing ChatPDF

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## ABSTRACT

**Purpose:** The paper introduces ChatPDF as a solution to the limited interaction capabilities of traditional PDF readers in library systems. It highlights the benefits of ChatPDF for enhancing user engagement and satisfaction with digital resources in libraries, and identifies potential areas for implementation and opportunities for further research.

**Design/methodology/approach:** The paper addresses the issue of limited PDF interaction capabilities of traditional PDF readers in library systems and their potential to cause frustration and disengagement among users. It proposes ChatPDF, an online software platform that leverages ChatGPT API to offer a more intuitive and natural way of engaging with PDF documents. The paper also outlines the various features and advantages of ChatPDF and its potential impact on library systems.

**Findings:** The paper concludes that ChatPDF offers a more advanced and user-friendly approach to interacting with PDF files than traditional PDF readers. It recommends libraries to consider implementing ChatPDF to enhance user engagement and satisfaction with their digital resources. The paper also identifies limitations and opportunities for future research in evaluating the impact of ChatPDF on user experience and library systems.

**Originality:** This paper introduces ChatPDF as a solution to the limited PDF interaction capabilities in library systems, highlighting its unique features and benefits, such as summarization, recommendations, multi-lingual support, and AI assistance. It also discusses the potential impact of ChatPDF implementation on library systems, making it an original and valuable contribution to the field of library science.

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## 1. Introduction

In the digital age, libraries have shifted from being purely physical spaces to also providing online resources for their users.<sup>1</sup> One common format for digital resources is the Portable Document Format (PDF). PDFs allow for easy distribution of information and can preserve the layout and formatting of a document, making them popular for academic articles, research reports, and other types of content.<sup>2</sup> However, one common problem with PDFs in library systems is their limited interaction capabilities.

Unlike web pages or other digital resources, PDFs do not have the same level of interactivity. Users are often unable to search within the document, make annotations or highlight text, or easily navigate to different sections. This can lead to frustration and disengagement for library users, who may prefer resources with more interactive features. Addressing the problem of PDF interaction in library systems is crucial for improving user engagement and satisfaction. By providing users with more interactive PDFs, libraries can enhance the user experience and increase the likelihood that users will return to the library as a resource.

One potential solution to this problem is ChatPDF.<sup>3</sup> ChatPDF is an online software platform that utilizes the

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power of ChatGPT API to provide users with a more intuitive and natural way to engage with PDF documents.<sup>4</sup> By integrating ChatPDF with library systems, patrons can access and interact with PDF documents through a chat-based interface, allowing for more efficient and effective communication with the library's digital resources like books, research papers, thesis, manuals, essays and whatever they want.<sup>5,6</sup> With ChatPDF, users can ask questions, request assistance, and navigate PDF documents with ease, making it an innovative and valuable addition to any library system.

## 2. Study objectives

The potential objectives of this study are,

1. To evaluate the effectiveness of ChatPDF in enhancing user engagement and satisfaction with digital resources in libraries.
2. To identify potential areas for ChatPDF implementation in library systems and the associated benefits and limitations.
3. To explore the unique features and advantages of ChatPDF, including summarization, recommendations, multi-lingual support, and AI assistance.
4. To assess the impact of ChatPDF implementation on library systems, including the usability and accessibility of digital resources.
5. To propose future research directions for evaluating the impact of ChatPDF on user experience and library systems.
6. To contribute to the field of library science by introducing ChatPDF as an innovative solution to the limitations of traditional PDF readers and highlighting its potential benefits for libraries and their users.

## 3. AI Revolution: ChatGPT in Library Systems

AI research and development has a rich history, with technologies like facial recognition and adaptive systems already in use. ChatGPT builds upon GPT-3, a language model introduced in 2020, showcasing the rapid progress in this field.<sup>7</sup> This highlights the accelerating pace of advancements in AI, signaling the early stages of an AI revolution.

ChatGPT in libraries has diverse applications, improving research, search, reference services, writing assistance, and information literacy instruction. It expands AI's impact, offering potential in multiple areas. Some of the previous study<sup>8–10</sup> tried to identify some of these areas, such as:

1. Instant access to a wealth of information within seconds
2. 24/7 availability for round-the-clock reference assistance
3. Multilingual support for diverse communities

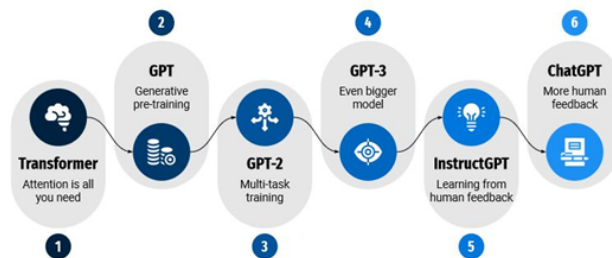


Fig. 1: Evaluation from transformer architecture to ChatGPT<sup>7</sup>

4. Personalized recommendations and services tailored to individual needs
5. Improved accessibility for users with visual or hearing impairments
6. Data collection and analysis for valuable insights on user needs
7. Scalability to handle large volumes of queries simultaneously
8. Enhanced user engagement through dynamic conversations
9. Integration with other library services for a seamless experience
10. Cost-effective alternative to human customer service representatives

In addition to the direct impact areas mentioned, ChatGPT is utilized by students, researchers, academicians, and library professionals in various applications. Indirectly, ChatGPT is integrated with other tools, such as SheetGPT,<sup>11</sup> to enhance services for users. ChatPDF is another tool that leverages the ChatGPT API for improved analysis and interaction with PDF files. To better understand the benefits of ChatPDF, the paper will further explore the limitations of traditional PDF interaction methods in the following section.

## 4. Limitations of traditional PDF interaction methods

Traditional PDF interaction methods have certain limitations that can impact the user experience and hinder engagement.

1. *Limited interactivity:* Traditional PDFs are static documents that offer limited interactivity, which can make them less engaging and less useful for users who are looking for more dynamic content. For example, users may not be able to interact with or manipulate the information in a traditional PDF in the same way that they could with a webpage or other digital content.
2. *Inefficient navigation:* PDFs can be challenging to navigate, particularly for longer documents. Users may have difficulty finding specific information or moving between different sections of the document, which can

lead to frustration and reduced engagement.

3. **Limited accessibility:** Traditional PDFs may not be accessible to all users, particularly those with visual impairments or other disabilities. PDFs may not be compatible with screen readers or other assistive technologies, which can make it difficult for some users to access the information in the document.
4. **Compatibility issues:** Some users may have difficulty accessing or viewing traditional PDFs due to compatibility issues with their devices or software. For example, a user may not be able to view a PDF on their mobile device or may have difficulty opening a PDF in a specific web browser.
5. **Limited analytics:** Traditional PDFs do not offer the same level of analytics and tracking as other digital content, which can make it challenging for publishers and marketers to understand how users are interacting with the document. This can make it more difficult to optimize content and improve engagement over time.

## 5. Introduction of Chat PDF

ChatPDF is a cutting-edge platform driven by artificial intelligence, enabling users to efficiently retrieve information from extensive PDF files, including research papers, books, legal contracts, essays, and manuals.<sup>12</sup> By engaging in natural language conversations, users can interact with PDF files as if they were having a conversation with a human. The AI-powered tool analyzes PDF files to provide summaries and extract relevant information, covering a wide range of content types, from textbooks and research papers to legal documents and contracts.<sup>13</sup> ChatPDF offers limitless possibilities, such as generating book summaries or providing brief biographies of main characters.

### 5.1. Features of ChatPDF

ChatPDF offers a range of distinctive features:<sup>12,14</sup>

1. **Utilizing AI technology:** Powered by advanced AI, ChatPDF ensures the delivery of accurate and reliable information.
2. **Information extraction:** Extract valuable information from various document types, including manuals, essays, legal contracts, books, and research papers.
3. **Semantic indexing:** Through semantic indexing, ChatPDF comprehensively analyzes PDFs, creating a semantic index for each paragraph. This enables more precise and relevant responses to user queries.
4. **Integration with ChatGPT API:** Seamlessly integrated with the ChatGPT API, ChatPDF processes user questions and provides responses using the power of natural language processing.
5. **Secure cloud storage:** Rest assured knowing that all data is stored securely in the cloud environment.

Furthermore, data is automatically deleted after 7 days, ensuring privacy and confidentiality.

6. **User-friendly interface:** Designed with a user-friendly interface, ChatPDF is accessible and intuitive, catering to the needs of students, professionals, and curious individuals alike.

### 5.2. Use Cases of ChatPDF:<sup>3,12</sup>

1. **For Students:** Elevate your learning experience with ChatPDF. Effortlessly comprehend textbooks, handouts, and presentations, eliminating the need for hours spent searching through research papers and academic articles. Support your academic growth by studying effectively and responsibly.
2. **For Work:** Streamline document analysis with ChatPDF. Quickly retrieve relevant information from financial reports, legal contracts, project proposals, and training manuals. Rest assured knowing that your data is securely stored in the cloud and can be deleted as needed.
3. **For Curious Minds:** Unleash your thirst for knowledge with ChatPDF. Explore the depths of historical documents, poetry, and literature, and gain valuable insights effortlessly. ChatPDF is equipped to understand multiple languages and can respond in your preferred language. Expand your horizons and satisfy your curiosity with a tool capable of answering any question from any PDF.

## 6. How ChatGPT API Enhance PDF Interaction tool ChatPDF Works?

Here are the steps that explain how the ChatGPT API enhances the PDF interaction tool ChatPDF.<sup>3,4,15</sup>

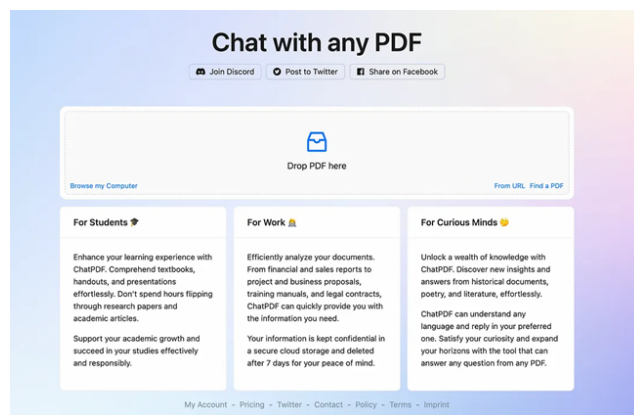


Fig. 2: ChatPDF interface<sup>3</sup>

1. **Upload PDF to ChatPDF:** Users can interact with their PDFs through ChatPDF by uploading the PDF file using any of the following three available options (see

Figure 2):

**Browse my Computer** - Users can upload a PDF from their personal computer by using this option.

**From URL** - This option can be used if users have the designated URL (with .pdf) of the PDF file.

**Find a PDF** - This option enables users to find a PDF available online by its title, author, or any other credential. ChatPDF provides a simple search interface and displays the results of all available options using the user's search prompt.

2. **Extract text and metadata:** ChatGPT API can analyze the PDF and extract text and metadata from it. This allows ChatPDF to understand the content of the PDF and provide more relevant suggestions and recommendations to the user.
3. **Natural language processing:** ChatGPT API uses natural language processing (NLP) to understand user queries and provide accurate responses. This means that users can interact with ChatPDF in a conversational manner, just like they would with a human librarian.
4. **Intelligent recommendations:** Based on the content of the PDF and user queries, ChatPDF can provide intelligent recommendations for related content. That means, ChatPDF by itself suggest a series of questions or important queries that users may need to know (see Figure 3). Just like FAQs. Additionally, if a user is reading a book about history, ChatPDF might suggest other books on similar topics.
5. **Interactive summarization:** ChatGPT API can generate interactive summaries of the PDF content (see Figure 3). This allows users to quickly understand the main points of a document without having to read the entire thing.
6. **Q&A assistance:** ChatGPT API can answer user questions related to the PDF content. For example, if a user wants to know more about a particular concept mentioned in the PDF, ChatPDF can provide a detailed explanation. They can ask any type of questions or queries and ChatPDF provide a meaningful answer based on the content available in the PDF file.

Overall, the ChatGPT API enhances the PDF interaction tool ChatPDF by enabling natural language processing, context-awareness, and easy annotation capabilities for a more engaging user experience.

## 7. Comparison of ChatPDF to traditional PDF readers

ChatPDF is a noteworthy improvement over conventional PDF readers, as it provides users with more versatile, dynamic, and natural language interaction with PDF files. A comparison table between ChatPDF and traditional PDF readers is presented in Table 1, highlighting the major differences between them.

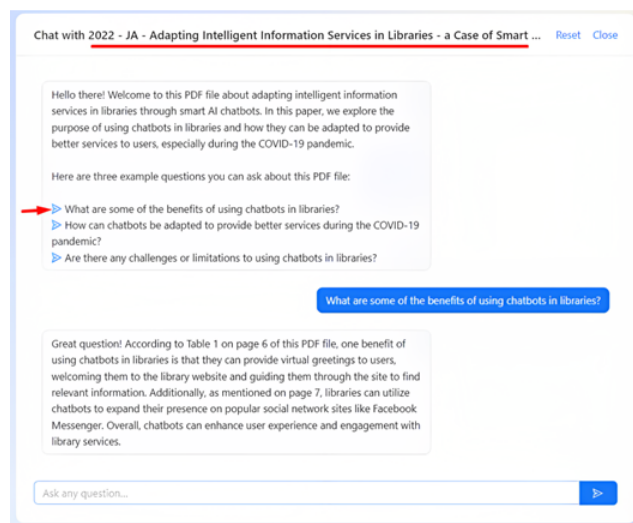


Fig. 3: Interaction with ChatPDF<sup>3</sup>

## 8. Possible Areas of ChatPDF Implementations in Library Systems

Here are some potential areas where ChatPDF could be implemented within existing library systems:

1. **Integration with existing library systems:** ChatPDF can be integrated into existing library systems through APIs to provide users a new way of interacting with PDF files through the library's online portal or mobile app.
2. **Virtual reference services:** ChatPDF can be used as a virtual reference service for library users, providing them with a more engaging and interactive way to access and explore PDF documents.
3. **Integration with library catalogue:** ChatPDF can be customized to include library-specific features, such as integration with the library's catalogue system or the ability to save notes or bookmarks within the PDF document.
4. **Accessible resources for diverse audiences:** ChatPDF's multi-lingual support and AI assistance features make it a useful tool for making library resources more accessible to diverse audiences, including non-native speakers and those with visual impairments.
5. **Online learning resources:** Libraries can use ChatPDF to provide online learning resources for their patrons. For example, a library could use ChatPDF to create interactive tutorials or guides for using library resources or conducting research.
6. **Electronic theses and dissertations (ETDs):** ChatPDF can be used to enhance the accessibility and interactivity of ETDs. For example, a library could use ChatPDF to provide summaries, recommendations, and AI assistance for ETDs to help users navigate and

**Table 1:** Comparison between ChatPDF and traditional PDF readers

SN	Domain	Traditional PDF readers	ChatPDF
1	Two way interaction	Traditional PDF readers only allow for one-way interaction with PDF files from the user end	ChatPDF facilitates bi-directional interaction with PDF files, allowing users to engage in live chats to interact with the PDF content
2	Easy summarization	Traditional PDF readers lack the ability to generate summaries of the content, leaving users with the task of reading the entire document to gain a comprehensive understanding of the content	ChatPDF is capable of generating a summary of the entire PDF file, which presents only the crucial information from the content in a concise format, and facilitate easy comprehension of the document, thereby enhancing the user experience
3	Valuable recommendation	Traditional PDF readers do not have the ability to provide recommendations for users to access relevant information available in the PDF file	ChatPDF provides some valuable recommendations or suggestions in points, highlighting the important aspects discussed within the PDF
4	Time saver	Traditional PDF readers are limited in their ability to assist users in saving time by providing an understanding of the PDF file without requiring them to read it in its entirety	Features such as easy summarization and recommendations assist users in navigating only the topics of their interest within the PDF, thereby saving their valuable time
5	Multi-lingual support	Most traditional PDF interaction tools are limited to supporting only the language in which the PDF content is written	Through the use of ChatGPT API, ChatPDF is able to offer support for multiple languages, thereby enhancing the user experience by providing the same content in various languages
6	AI assistance	Traditional PDF readers lack AI assistance for the users, leaving them to rely solely on their own understanding and interpretation of the content	ChatGPT API integration with ChatPDF enables the provision of AI assistance to users, enabling them to ask questions related to the PDF content and receive accurate and relevant responses
7	Cross-platform compatibility	Traditional PDF readers that may have platform-specific compatibility issues	ChatPDF is compatible with all major web browsers and operating systems, making it more versatile and convenient for users to access

understand the content.

7. *Historical and rare collections:* ChatPDF can be used by libraries to create digital collections of historical documents or rare books, where users can interact with the documents in a more interactive and engaging way.

## 9. Conclusion

The ChatPDF tool provides an innovative and advanced approach to interacting with PDF files compared to traditional PDF readers. With its user-friendly features such as summarization, recommendations, multi-lingual support, and AI assistance, ChatPDF offers a flexible and natural language interaction experience that significantly improves user engagement and satisfaction. Therefore, libraries are encouraged to consider adopting ChatPDF to enhance their users' PDF interaction experience.

However, this study has some limitations and presents opportunities for further research. While the ChatPDF system has been developed and tested, its actual impact on user experience and library systems requires further

exploration. Future research could focus on evaluating user satisfaction and engagement with ChatPDF in library systems, identifying additional features and enhancements, and assessing the potential impact of ChatPDF implementation on library systems.

## 10. Source of Funding

None.

## 11. Conflict of Interest

None.

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