

Application of Conversational Generative Pre-trained Transformer for improvement of information services in academic libraries

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Conversational Generative Pre-Trained Transformer (ChatGPT) can be applied in academic libraries to provide information services in the Fifth Industrial Revolution (5IR). In providing information services in academic libraries, ChatGPT refers to an artificial intelligence (AI)-powered chatbot or virtual assistant specifically tailored for library environments cybrarians can use to provide information services in academic libraries. The purpose of this study was to investigate the application of ChatGPT to provide information services in academic libraries in the 5IR. This qualitative study used literature review as methodology and incorporated insights from researchers' experiences with using AI chatbots such as ChatGPT to provide information services in academic libraries in the 5IR. The study findings revealed that ChatGPT can effectively provide information services in academic libraries in the 5IR. It can enable smooth interaction between the patrons and the library, and answer queries of patrons. It can provide information services around the clock without interruption. This study proposes a framework to apply ChatGPT to provide information services in academic libraries in the 5IR, which can guide academic libraries in the 5IR to adopt and utilise ChatGPT to provide the information services effectively and efficiently.

Keywords: Artificial intelligence chatbots, ChatGPT, digital libraries, cybrarian, academic libraries, Fifth Industrial Revolution

1 Introduction

Artificial intelligence (AI) chatbots such as the Conversational Generative Pre-Trained Transformer (ChatGPT) can be applied in academic libraries to provide information services in the Fifth Industrial Revolution (5IR). In the context of providing information services in academic libraries, ChatGPT refers to an AI-powered chatbot or virtual assistant specifically tailored for library environments (Subaveerapandiyani 2023). ChatGPT utilises natural language processing (NLP) algorithms to understand and respond to patrons' inquiries, assisting them with various library-related tasks and information needs (Alawida et al. 2023). This may include helping patrons search for books or resources, providing recommendations, answering questions about library policies or services, offering research assistance, and facilitating interactions with academic library databases or catalogues. Integrating ChatGPT into academic library services can help academic libraries better meet the information needs of their patrons, enhance user experience, and promote engagement with library resources and services. However, it is essential to ensure that appropriate safeguards are in place to address privacy concerns and maintain the quality of information provided by ChatGPT (Mukherjee & Patra 2023). If implemented adequately, ChatGPT can help cybrarians in academic libraries provide digital information services in the 5IR.

Kesselman and Weintraub (2004) suggest that an academic library refers to a library that is attached to a higher education institution and serves to support the teaching and learning as well as the research taking place in that institution. Academic libraries provide researchers, students and academics with information resources and library services to support research, teaching and learning in the university. Among the library services, information services are one of the services provided by the academic libraries through cybrarians responsible for information services. According to Vijesh, Srilakshmi and Ganesan (2021), cybrarians are essential professionals dedicated to delivering comprehensive library cyber services across various digital platforms. Equipped with a diverse skill set, cybrarians adeptly navigate the digital landscape to provide seamless support to remote library patrons. Their proficiency extends to leveraging cutting-edge technologies like ChatGPT, empowering them to deliver enhanced digital information services to library patrons, particularly those engaging virtually (Vijesh et al. 2021). Beyond facilitating access to library resources, cybrarians play a pivotal role in ensuring that patrons, regardless of their location, can effectively use library services. They offer tailored digital assistance, ensuring that individuals can leverage library resources to their fullest potential (Kesselman & Weintraub 2004). Moreover, cybrarians excel in conducting informative sessions on the utilisation of ChatGPT for delivering information services within library

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settings. In essence, cybrarians serve as catalysts for bridging the gap between traditional library services and the dynamic digital landscape, thereby enriching the patron experience, and fostering greater accessibility to knowledge resources via AI chatbots such as ChatGPT (Vijesh et al. 2021).

ChatGPT refers to the use of an AI collaborative app that can be used by human intelligence (HI) to interact with AI, especially in the 5IR. The 5IR refers to harmonious human-machine collaboration, which eliminates the competition between HI and AI. In the 5IR, the strength of AI is combined with the strength of HI to improve the quality of education using AI-embedded ChatGPT (Ziatdinov, Atteraya & Nabiyev 2024). ChatGPT (Chat Generative Pre-Trained Transformer) refers to a language model that uses deep learning techniques to generate text. It is pre-trained on a massive amount of text data, including books, articles, and websites, which allows it to generate text that is like text written by humans (Roumeliotis & Tselikas 2023). According to Roumeliotis and Tselikas (2023), it is designed to generate text in response to a given prompt or context, and it can be fine-tuned for specific tasks such as language translation, summarisation and question answering. ChatGPT is an advanced chatbot that uses NLP and machine-learning algorithms to create a platform between the library and the patrons (Ray 2023).

In the 5IR, information services in academic libraries encompass the utilisation of advanced technologies and innovative approaches to provide access to, manage and disseminate information effectively (Ziatdinov et al. 2024). Information services refer to the integrated use of cutting-edge technologies, such as AI, machine learning, big data analytics and the Internet of Things (IoT), to facilitate the discovery, retrieval, organisation, and dissemination of information resources (Huang, Cox & Cox 2023). These services go beyond traditional library functions to encompass digital collections, personalised recommendations, virtual assistance, and data-driven decision-making processes. In this context, academic libraries serve as dynamic hubs of knowledge and innovation, leveraging emerging technologies to enhance user experiences, promote lifelong learning and address the evolving information needs of diverse communities (Zamiri & Esmaeili 2024). However, in the context of this ChatGPT, the AI chatbots can be used to provide such services in academic libraries in the 5IR (Roumeliotis & Tselikas 2023). According to Adetayo (2023), ChatGPT can help with technical and reader services such as answering basic reference inquiries, navigating the library website, and helping with research, metadata services, information organisation and collection development, but should be a complementary technology rather than a replacement for human librarians. Hence, this study intended to investigate the application of ChatGPT to provide information services in the 5IR and recommend a framework for how academic libraries can apply to provide information services to patrons.

2 Problem statement

The issue that prompted this study arose from the continued reliance of academic libraries on chatbots like "Ask the Librarian" to engage with patrons and address inquiries about library services and general issues. While the effectiveness of the "Ask the Librarian" tool varies based on staffing and operational hours, there are instances when the service is not available, leaving patrons without immediate assistance. Furthermore, even during operational hours, response delays may occur, particularly during peak periods or when numerous inquiries need addressing. These challenges persist mainly because most "Ask the Librarian" tools lack AI integration, hindering their ability to offer effective 24/7 information services (Kamada et al. 2021).

In contrast, ChatGPT stands out as a solution capable of providing round-the-clock support, allowing patrons access to information and assistance beyond regular library hours. With ChatGPT, patrons receive instant responses to their queries, eliminating waiting for assistance or the need to navigate library resources independently. Its user-friendly interface simplifies interaction with library services, enhancing accessibility to information resources and support. Moreover, patrons can access ChatGPT from anywhere with an internet connection, thereby extending library services to individuals who may face challenges visiting the library in person (Saeidnia, 2023). Consequently, this study aimed to implement ChatGPT for delivering information services in academic libraries within the context of the 5IR.

3 Purpose and objectives of the study

The purpose of the study was to investigate the application of ChatGPT for improving information services in academic libraries in the 5IR. The following were the objectives of the study:

- To evaluate the significance of ChatGPT in the provision of information services in academic libraries in the 5IR.
- To assess the demerits of using ChatGPT to provide information services in academic libraries in the 5IR.
- To identify the tools required for the application of ChatGPT to provide information services in academic libraries in the 5IR.
- To determine if cybrarians have the skills and competencies to use ChatGPT to provide information services in academic libraries in the 5IR.

- To recommend a framework to apply ChatGPT to improve the provision of information services in academic libraries in the 5IR.

4 Literature review

The literature review of this study was based on the following: the significance and demerits of ChatGPT to provide information services in academic libraries, the tools required to apply ChatGPT to provide information services in academic libraries and the skills of cybrarians to use ChatGPT to provide information services in academic libraries.

4.1 Significance of ChatGPT to provide information services in academic libraries

According to Menon and Shilpa (2023), academic libraries in the 5IR can significantly enhance their information services by incorporating ChatGPT, a robust virtual assistant, into their operations. ChatGPT serves as an indispensable tool for improving accessibility, efficiency, and user satisfaction, thereby solidifying academic libraries' roles as vital community resources for knowledge and information. Ray (2023) suggests that ChatGPT's round-the-clock availability ensures that library patrons have access to information whenever they need it, transcending the limitations of traditional library hours. This means that, through ChatGPT, the library patrons can access information services at any time, regardless of library operating hours, enhancing accessibility and convenience. This continuous accessibility fosters a more dynamic and inclusive library environment, empowering patrons to explore knowledge at their convenience. Moreover, ChatGPT's swift response capabilities, as noted by Menon and Shilpa (2023), minimise waiting times and enhance user satisfaction. Whether it is a late-night study session or an early morning research endeavour, the library patrons can rely on ChatGPT's efficiency and unwavering support.

ChatGPT's ability to handle multiple queries concurrently, as articulated by Roumeliotis and Tselikas (2023), enables academic libraries to effectively scale their information services without requiring additional staff. With access to a vast repository of knowledge across various domains, ChatGPT accurately addresses inquiries ranging from academic research to general topics. Furthermore, ChatGPT's internet accessibility, as emphasised by Menon and Shilpa (2023), allows patrons to tap into its resources from anywhere, eliminating the constraints of physical library visits and offering unparalleled convenience. Lai (2023) asserts that ChatGPT has the capability to offer consistent and standardised responses to queries, thereby ensuring that library patrons receive accurate information, regardless of the availability or expertise of cybrarians. Its presence in academic libraries guarantees consistent provision of information services, granting all library patrons equal access as long as they have internet connectivity (Saeidnia 2023). Moreover, implementing ChatGPT can potentially decrease unnecessary staffing costs associated with information services, particularly during off-peak hours or in resource-constrained academic libraries (Lai 2023).

Therefore, utilising advanced machine-learning algorithms, ChatGPT continuously learns from user interactions, enabling it to deliver increasingly personalised recommendations and responses over time, enriching the overall user experience (Chakraborty et al. 2023). Its multilingual capabilities also empower academic libraries to cater more effectively for diverse communities. Moreover, ChatGPT serves as a valuable resource for cybrarians by intelligently escalating more complex questions to human staff, thereby augmenting, and supporting their work (Chakraborty et al. 2023). This collaborative approach to information services enhances accessibility and satisfaction for library patrons.

Engaging with ChatGPT can also facilitate the development of patrons' digital literacy skills, as suggested by Menon and Shilpa (2023), by acquainting them with conversational AI technology and guiding them in formulating effective search queries. Integrating ChatGPT into information services presents a more cost-effective solution than hiring additional staff or investing in alternative technologies (Shahsavari & Choudhury, 2023). By leveraging ChatGPT's capabilities, academic libraries not only enhance user engagement, but also contribute to the cultivation of essential digital competencies in their patrons, fostering a more digitally proficient and empowered community (Alawida et al. 2023).

4.2 Demerits of using ChatGPT to provide information services in academic libraries

According to Hamilton, Elliott and Choplin (2023), there are several drawbacks to utilising ChatGPT for information services in academic libraries during the 5IR. ChatGPT has been critiqued for its perceived lack of emotional intelligence, potentially impeding its ability to effectively understand and respond to the emotions of library patrons, leading to interactions lacking empathy (Elyoseph et al. 2023). Additionally, it has been observed that ChatGPT may struggle to accurately interpret the context of queries from library patrons, occasionally providing responses that are inaccurate or irrelevant, particularly in complex or ambiguous scenarios (Hadar-Shoval, Elyoseph & Lvovsky 2023).

ChatGPT's responses may inadvertently reflect biases present in its training data, posing a risk of perpetuating stereotypes or spreading misinformation if not properly identified and addressed (Roumeliotis & Tselikas 2023). Moreover, while ChatGPT is adept at handling various inquiries, it may falter when faced with exceptionally complex or nuanced

questions requiring deep domain expertise or critical thinking skills beyond its current capabilities (Hamilton et al. 2023). Without adequate oversight and validation mechanisms by information cybrarians, ChatGPT risks providing inaccurate or misleading information, particularly on subjects characterised by uncertainty or controversy (Concannon, Roberts & Tomalin 2023).

Additionally, concerns regarding data privacy, security breaches and potential misuse of user data arise due to ChatGPT's interaction with sensitive information from library patrons, necessitating vigilant management by cybrarians (Ho et al. 2024). Depending on internet connectivity, ChatGPT's functionality may be disrupted by internet service interruptions or downtime, potentially hindering access to information services offered by the library. Despite its ability to engage in basic conversational interactions with library patrons, ChatGPT may struggle to maintain coherence and context during prolonged conversations, leading to disjointed interactions (Javaid, Hleem & Singh 2023).

In many instances, cybrarians may rely excessively on ChatGPT to deliver information services, but this can become problematic during ChatGPT's downtime. During such periods, cybrarians may find it challenging to revert to traditional library information services to assist patrons with their inquiries (James & Filgo 2023). Additionally, patrons with limited digital skills may prefer human interaction for personalised assistance or when dealing with complex inquiries, rendering ChatGPT ineffective for these individuals (Hasanein & Sobaih 2023).

4.3 Technological tools required to use ChatGPT to provide information services in academic libraries

Hadar-Shoval et al. (2023) suggest that academic libraries in the 5IR need the technological tools to ensure that ChatGPT is applied to adequately provide information services in academic libraries. Elyoseph et al. (2023) opine that academic libraries should incorporate the ChatGPT Application Programming Interface (API) into their cloud-based library management systems to facilitate communication between library patrons and the AI model. This integration enables ChatGPT to receive user queries, analyse them and generate suitable responses. API denotes a collection of rules, protocols and tools enabling various software applications to communicate and interact with each other effectively (Elyoseph et al. 2023).

Ensuring a user-friendly interface is essential for facilitating interactions between library patrons and ChatGPT. This interface should enable the library patrons to input their questions or requests effortlessly and receive responses in a clear and comprehensible format (Concannon et al. 2023). Additionally, NLP tools play a crucial role in preprocessing library patrons' queries before they are forwarded to ChatGPT. These tools aid in cleaning and formatting text inputs, extracting pertinent keywords and ensuring that ChatGPT can comprehend and process the patrons' questions effectively (Alawida et al. 2023). Ray (2023) states that academic libraries may consider integrating ChatGPT with their current knowledge bases or digital collections to augment the AI model's capacity to furnish precise and pertinent information. This integration could entail linking ChatGPT with databases, catalogues, digital repositories, or online resources (Hamilton et al. 2023). Moreover, ChatGPT necessitates robust machine-learning infrastructure for tasks like training, fine-tuning and deployment. Hence, academic libraries might require access to computational resources, such as cloud-based services, to support these endeavours effectively within their space (Ho et al. 2024).

According to Concannon et al. (2023), academic libraries have the responsibility to prioritise the implementation of robust data privacy and security measures to safeguard user information and maintain compliance with pertinent legislation such as the Protection of Personal Information Act (POPIA). This entails encrypting user data, instituting access controls and adhering to best practices for managing sensitive information about the patrons in the library (Ho et al. 2024). Additionally, academic libraries should utilise monitoring and analytics tools to assess ChatGPT's performance, acquire insights into user interactions and indicate areas for enhancement. These tools are instrumental in enabling academic libraries to optimise ChatGPT's effectiveness and enhance patron user satisfaction over time (Hamilton et al. 2023).

4.4 Skills and competencies of cybrarians to apply ChatGPT to provide information services in academic libraries

Roumeliotis and Tselikas (2023) opine that in order for academic libraries to apply ChatGPT effectively and efficiently to provide information services in academic libraries, cybrarians should have adequate skills. "Cybrarians" is a term coined by combining "cyber" and "librarians". It refers to librarians who specialise in digital and information technology, focusing on managing and providing access to digital resources and services in academic libraries.

Cybrarians are expected to demonstrate proficiency in utilising digital tools and technologies, including ChatGPT, to aid patrons in effectively accessing and navigating digital resources (Hadar-Shoval et al. 2023). Additionally, cybrarians should possess skills in data management and organisation, encompassing the ability to structure and categorise information strategically to optimise ChatGPT's accuracy and effectiveness (Roumeliotis & Tselikas 2023). Cybrarians should possess knowledge of diverse information retrieval techniques, including keyword searching, Boolean operators and

advanced search strategies, to assist patrons to acquire pertinent information from ChatGPT (Guimaraes et al. 2024). Additionally, strong communication skills are essential for cybrarians to proficiently engage with patrons, discern their information requirements and articulate complex information in a comprehensible manner (Khan et al. 2017). Cybrarians are required to have critical thinking skills to evaluate the accuracy, relevance, and credibility of ChatGPT's responses, as well as to recognise any potential biases or limitations in the information offered. Furthermore, cybrarians should excel in troubleshooting technical problems and resolving user queries or difficulties associated with engaging with ChatGPT or utilising information services (Khan et al. 2017).

Cybrarians should possess a grasp of user experience (UX) design principles to enhance the interface and user interaction with ChatGPT, ensuring a smooth and intuitive experience for library patrons (Guimaraes et al. 2024). Additionally, they should be capable of creating and delivering training sessions or instructional materials to educate patrons on effectively utilising ChatGPT and optimising its benefits for their information needs. Moreover, cybrarians should demonstrate a commitment to continuous learning and professional development to remain abreast of emerging technologies, best practices in information services and advancements in NLP and AI (Guimaraes et al. 2024).

5 Research methodology

This qualitative study employed content analysis as its research methodology, informed by an extensive literature review that incorporated insights derived from the researchers' practical experiences in utilising ChatGPT to deliver information services within academic libraries in the 5IR. The exploration of pertinent literature was guided by thematic considerations and keywords such as "ChatGPT", "information services", "Cybrarians" and "Fifth Industrial Revolution".

The literature review process entailed the utilisation of diverse search engines, including, but not limited to, Google Scholar, ResearchGate, Web of Science, EBSCOhost, ScienceDirect, Springer and Sage, chosen for their ability to access a wide array of websites housing relevant scholarly information. A systematic refinement of searches was achieved through the utilisation of specific keywords, yielding a substantial corpus of literature sources. The researcher meticulously navigated through search results, sifting through various sources to find and retrieve literature pertinent to the study.

Documents were rigorously identified and selected based on their relevance and applicability to the research inquiry. The initial screening phase involved scrutiny of titles and abstracts to eliminate redundancy. Subsequently, full-text articles meeting the inclusion criteria underwent further evaluation. The researchers employed thematic analysis, adhering to Braun and Clarke's (2006) methodological framework, to systematically scrutinise qualitative data or textual excerpts from preceding studies. This analytical process involved the systematic examination, synthesis, and interpretation of data, with categorisation guided by key research objectives pertaining to the focal subject matter.

The data collected and extracted from the selected articles were then synthesised and presented to foster a contextualised and coherent understanding of the research issues at hand. The resulting findings were organised into thematic categories such as "ChatGPT", "Information Services", "Cybrarians" and "Fifth Industrial Revolution", thereby offering valuable insights into the integration of ChatGPT technology in delivering information services within academic libraries against the backdrop of the 5IR.

6 Findings of the study

The study findings were rooted in the utilisation of ChatGPT for information provision within academic libraries amidst the 5IR. Within library settings, ChatGPT assumes a pivotal role in ensuring seamless delivery of information services. Its presence enables academic libraries to offer round-the-clock assistance to patrons, thereby ensuring unfettered access to information services (Ray 2023). By furnishing immediate responses to inquiries and guiding patrons on remote access to library services, ChatGPT extends the reach of library resources beyond physical confines. Moreover, it empowers personalised service delivery tailored to individual patrons' preferences and search histories.

Effectively harnessing ChatGPT within library contexts necessitates the integration of 5IR technological tools. Such tools encompass API integration, facilitating seamless communication between patrons and ChatGPT for prompt query resolution. User interface tools enhance interaction between patrons and the AI system, while NLP capabilities enable ChatGPT to comprehend queries and furnish pertinent responses (Alawida et al. 2023). Additionally, machine-learning tools are indispensable for training ChatGPT, ensuring its proficiency in addressing diverse queries with accuracy.

Technological infrastructure such as API is required to ensure that ChatGPT integrates adequately with other library systems. ChatGPT must also have a user-friendly interface and allow patrons to input their questions and requests easily. Other library systems it must integrate with include knowledge base and library management systems, to ensure that information services are provided effortlessly. The significance of ChatGPT includes providing round-the-clock access to information, allowing patrons to access them whenever they need them. It can handle multiple queries simultaneously, allowing patrons to access similar documents concurrently from anywhere. The findings of this study further indicated that

ChatGPT might reflect biases based on how it is trained to manage data. Issues such as data privacy and breaches might be a challenge when applying ChatGPT in the information services in academic libraries.

However, cybrarians must possess the requisite skills to effectively leverage AI chatbots like ChatGPT for information provision (Vijesh et al. 2021). These skills encompass digital literacy, enabling them to proficiently utilise ChatGPT for user assistance. Moreover, proficiency in information retrieval is crucial for accessing resources through ChatGPT. Strong communication skills are imperative for effective user engagement, while training in ChatGPT operation is essential for guiding patrons in accessing information services (Guimaraes et al. 2024).

7 Recommendations

This section proposes a framework for incorporating ChatGPT for information services into academic libraries in the 5IR. AI chatbots like ChatGPT have the capability to facilitate access to library information services for library patrons at anytime and anywhere via the internet and smart computing technologies. By interacting with ChatGPT, library patrons can access remote services around the clock, as depicted in figure 1. This framework emphasises the interaction between ChatGPT and library patrons to ensure smooth and comprehensive access to library information services during the 5IR.

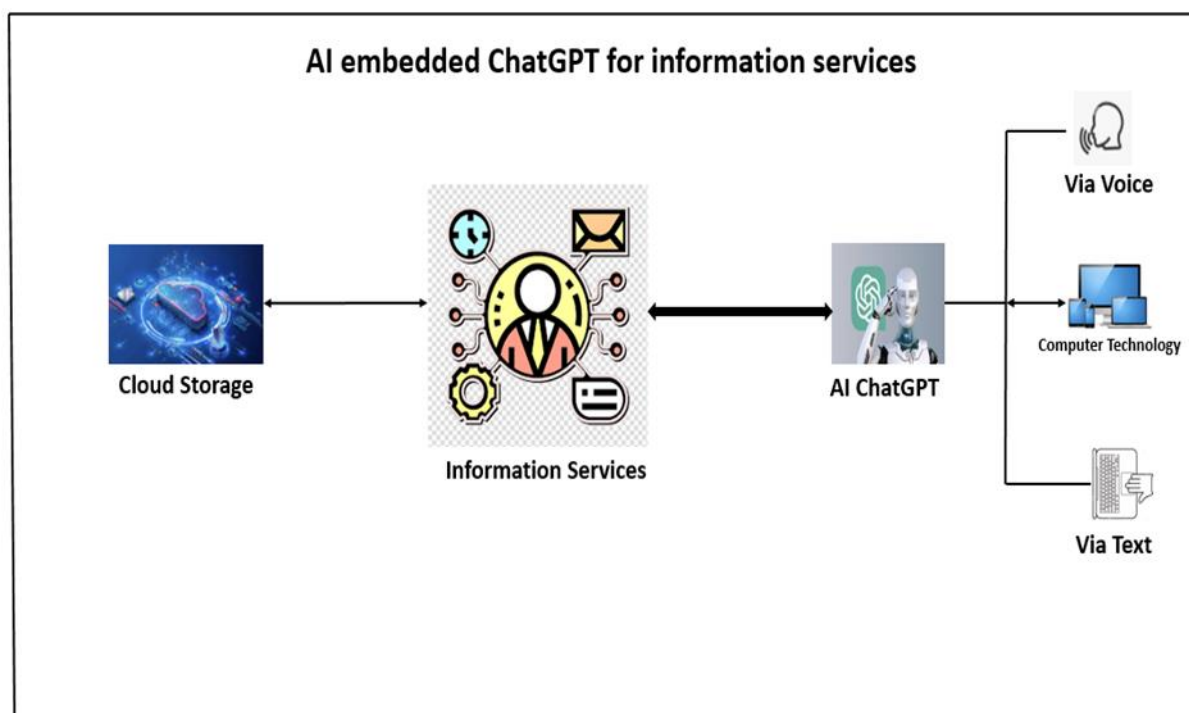


Figure 1: Framework to use ChatGPT for information services in academic libraries in the 5IR

This framework begins with the academic library patrons utilising ChatGPT, which is the AI chatbot, to access comprehensive information services provided by academic libraries, available around the clock. Library patrons can benefit from the versatile interaction with ChatGPT: they can engage through voice commands, leveraging its voice functionality or opt for traditional keyboard input. This dual functionality ensures seamless communication between the library patrons and the library information services, allowing them to articulate queries and seek assistance effortlessly. Consequently, library patrons are poised to receive answers and solutions promptly, facilitated by ChatGPT's integration with smart computer technology such as smart phones, smart laptops, and smart computers.

Upon receiving library patrons' inquiries, ChatGPT swiftly processes them and retrieves pertinent answers from cloud-based information services. Specifically programmed for academic libraries operating within the 5IR, ChatGPT seamlessly accesses information from the library's cloud-based repository. The spectrum of queries addressed by this AI tool (ChatGPT) encompasses various facets, including general information about library services, the availability of resources, the location of materials, operational hours and instructions on library usage. Moreover, ChatGPT extends its utility by granting the library patrons access to digital library services, facilitating seamless navigation through digital information sources.

Tailoring its responses to the nature of each inquiry, ChatGPT engages with the cloud-based information services hub to furnish the library patrons with the most relevant and accurate answers. Leveraging smart computer technology, library patrons receive these responses promptly, enriching their library experience with efficient information retrieval and

assistance. From elucidating the array of services offered by the library to providing insights into operational hours and resource availability, ChatGPT serves as a knowledgeable and accessible guide for library patrons navigating the library landscape.

The accessibility of these answers and solutions generated through ChatGPT in the digital information services hub is underpinned by the cloud-based nature of the services, enabling library patrons to connect with the library at anytime from anywhere via the internet. This seamless accessibility not only enhances patrons' awareness of library services, but also facilitates convenient access to digital information sources and services. As academic libraries adapt to the dynamics of the 5IR, ChatGPT emerges as a cornerstone tool, fostering a symbiotic relationship between the library patrons and library resources in an increasingly digital age.

8 Conclusion

In conclusion, the integration of ChatGPT is a pivotal step in ensuring universal access to information and digital services offered by academic libraries in the 5IR, transcending geographical boundaries and temporal constraints through the power of the internet and smart computer technology. Regardless of their location, library patrons can leverage ChatGPT to pose inquiries to the library, receiving accurate and timely responses owing to the AI chatbot's programmed expertise in providing solutions. This seamless interaction with ChatGPT not only facilitates easy access to library services, but also enhances the efficiency and speed of information retrieval, ushering in a new era of accessibility in library operations. Furthermore, ChatGPT serves as a gateway to digital library services, enabling library patrons to remotely access and utilise resources without the need for physical presence.

This paradigm shift eliminates the necessity for library patrons to undertake physical journeys to academic libraries, democratising access to information and services in an unprecedented manner through AI chatbots such as ChatGPT. By leveraging AI ChatGPT, academic libraries can transcend traditional barriers and cater for the diverse needs of library patrons in the digital age. It is imperative for academic libraries to embrace the potential of ChatGPT as a tool for delivering information services and addressing common queries posed by library patrons in the 5IR. While academic libraries may initially spearhead such initiatives due to their financial resources, the benefits discovered can pave the way for broader adoption across various library and information sectors.

As efficacy and effectiveness are demonstrated, academic libraries and other institutions can follow suit, embracing ChatGPT to provide cloud-based information and digital services, thereby enriching the library experience for library patrons across the board. Through proactive exploration and implementation of innovative technologies like ChatGPT, academic libraries can position themselves at the forefront of information dissemination and service provision, ensuring relevance and accessibility in the digital era.

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