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Anthropomorphic AI in Academic Libraries: A Phenomenological Study of System Librarians' Lived Experiences across Nigerian Geopolitical Zones

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ABSTRACT

This study investigates system librarians' perspectives and lived experiences with the integration of AI anthropomorphism in Nigerian academic libraries for web-based service delivery. A qualitative phenomenological approach was adopted, utilizing a focused group discussion with six system librarians purposively selected from across Nigeria's six geopolitical zones. Data from the semi-structured interview were analyzed thematically. The results revealed that AI anthropomorphism significantly enhances user engagement and accessibility, particularly for hesitant patrons, and offers operational benefits through personalized, scalable services. However, substantial challenges were identified, including risks of user misunderstanding, eroded trust, potential emotional dependency, and ethical dilemmas concerning data privacy and transparency. A clear generational divide in acceptance was also observed. The study concludes that the successful integration of anthropomorphic AI requires a balanced, human-centered approach guided by robust ethical frameworks to ensure these technologies augment rather than compromise the library's mission.

Keywords: AI anthropomorphism, Academic libraries, System librarians, Human-computer interaction, Web-based library services, Phenomenological study

INTRODUCTION

Information and communication technologies (ICTs) have long been primary drivers of development in academic libraries, enhancing user education, organizing knowledge more efficiently, and improving information retrieval. These technologies bridge the gap between traditional and modern information environments, making information accessible at the touch of a button. The mid-2010s witnessed rapid advances in technologies such as cloud computing,

augmented and virtual reality, machine learning, the Internet of Things, and artificial intelligence (AI)--a period widely referred to as the Fourth Industrial Revolution (4IR).

Klaus Schwab, who coined the term, described the 4IR as an era driven by a fusion of technologies that blur the lines between the physical, digital, and biological spheres (Schwab, 2025). It represents a continuous transformation in how people live, work, and interact, making it increasingly difficult to distinguish between these domains (Hanna and Wigmore, 2025). During this period, digital technology and data are essential to human development. These 4IR technologies have the potential to completely transform academic library operations, impacting every procedure and automating many conventional services, thereby enabling more user-tailored information delivery.

Academic libraries have been at the forefront of adopting 4IR technologies to improve operational effectiveness and efficiency (Ajani et al., 2024; Ochella & Ochella, 2020; Tella, 2020a; Tella et al., 2022). However, in developing countries like Nigeria, the adoption of these technologies remains uneven, with some being more prominent than others. Technologies such as makerspaces, research data services, and particularly AI show promise for significant future impact, yet their use is still limited. A particularly intriguing development within this technological wave is the trend of AI anthropomorphism--the design of AI systems with human-like characteristics, such as conversational chatbots, virtual assistants with personalities, and avatars that simulate human interaction. This humanization of technology has the potential to make digital services more intuitive and engaging, transforming how users discover and interact with information. However, the adoption of such advanced technologies is inherently uneven, creating a stark contrast between technological haves and have-nots. In the Global South, where academic libraries often grapple with resource constraints, infrastructural challenges, and ethical concerns, the integration of sophisticated AI presents a complex dilemma.

The integration of AI anthropomorphism in academic libraries presents not only endless opportunities but also complex challenges. Panda and Chakravarty (2022) argue that AI anthropomorphism should feature prominently in academic libraries' digital transformation agendas, as it can streamline processes and enhance efficiency (Tella and Ajani, 2022; Kalbande et al., 2024). It has the potential to significantly alter how we discover, learn, and work (Ajani et al., 2025; Wiley, 2025). As Tella (2020a) and Zondi et al. (2024) point out, AI anthropomorphism offers many advantages to academic libraries, including ubiquity, 24/7 service, efficient delivery, and reduced staff workload. However, concerns persist about its employment, especially in resource-constrained countries of the Global South. These include ethical issues, privacy concerns, limited staff capacity, and poor infrastructure to support AI anthropomorphism services and tools (Kalbande et al., 2024).

If unaddressed, these challenges may further deepen the prevailing digital divides between institutions that can afford advanced AI technologies and those that cannot. For this reason, the International Federation of Library Associations and Institutions (IFLA, 2020) and Tella and Ajani (2022) caution that AI anthropomorphism in academic libraries should be governed by clear ethical standards to balance privacy concerns with the need for information access. Furthermore, librarians must be equipped to understand AI anthropomorphism applications, along with their associated ethical risks and implications (Filson and Atuase, 2024). Ochella and Ochella (2020)

urge academic libraries to interrogate, popularize, and advance the development and application of AI anthropomorphism. Without embracing these technologies, academic libraries risk obsolescence. Additionally, libraries must enhance the visibility of their digital transformation initiatives in web-based service delivery to ensure transparency and demonstrate their ability to keep pace with trends.

Prior to this study, the extent to which academic libraries integrate AI anthropomorphism into their functions and operations, and the visibility of such integration on their web-based service platforms, remained unclear. Web-based services are the primary gateways through which academic library resources are accessed (Eromosele and Kayode 2025; Kayode et al., 2020; Tella et al., 2020). This study employs a qualitative phenomenological approach to explore the integration of AI anthropomorphism in academic libraries across Nigeria's geopolitical zones. This methodology not only provides insight into the technological applications of AI anthropomorphism in Nigerian academic libraries but also highlights the visibility of these initiatives in their web-based service delivery. It is hoped that this study will stimulate further dialogue and inquiry into this critical area in other parts of the world, especially in developing countries. While previous research in Nigeria has broadly explored the adoption of 4IR technologies in academic libraries (Ajani et al., 2024; Oyedokun, 2025; Tella et al., 2022), none has focused specifically on AI anthropomorphism.

This study is guided by four objectives: 1) to investigate the experiences and perceptions of academic librarians in Nigeria regarding the integration of AI anthropomorphism in library functions and operations; 2) to identify the applications of AI anthropomorphism currently visible and accessible through the web-based service delivery platforms of Nigerian academic libraries; 3) to investigate the perceived benefits of AI anthropomorphism on service delivery, including its influence on efficiency, user engagement, and the evolving nature of librarian roles; and 4) to ascertain the primary challenges and ethical considerations, as perceived by academic librarians, that impede the effective and responsible implementation of AI anthropomorphism in the context of the Global South. The results offer valuable insights into how academic libraries in Nigeria are embracing AI anthropomorphism to enhance their services and the visibility of these initiatives in their web-based service delivery.

LITERATURE REVIEW

This literature review contextualizes AI anthropomorphism in relation to the study's objectives. It provides a high-level review of literature on the integration of AI anthropomorphism in academic libraries, concluding with the research gap this study aims to address.

The Meaning of AI Anthropomorphism in Academic Libraries

Although the term AI entered public discourse around the 2010s to 2020s due to significant breakthroughs like advanced robotics, chatbots, and applications such as ChatGPT, its first known use dates back to a 1955 proposal by McCarthy et al. (2006). Initially, the term referred to computers capable of performing routine tasks. Despite its long history, there is no universal agreement on what constitutes AI, leading to varied formal definitions (UNESCO, 2019). However, common patterns are noticeable in the available definitions (Cox and Mazumdar, 2024).

The Organisation for Economic Co-operation and Development (OECD, 2024) defines AI as "machine-based systems that, for explicit or implicit objectives, infer, from the input they receive, how to generate outputs such as predictions, content, recommendations, or decisions that can influence physical or virtual environments." In the context of libraries, the American Library Association (2019) defines AI as the use of deep learning, machine learning, and natural language processing to create "intelligent" machines that work and react like humans. AI relies on mimicking human capabilities (Anjila et al., 2021), a point echoed by Rabatseta et al. (2024), who note that AI involves collaboration between humans and robotic machines to improve job performance, generate increased competence, and drive economic progress. AI focuses on human behavior and how machines can imitate it (Asemi et al., 2021).

AI anthropomorphism specifically involves designing AI agents with humanoid features, conversational language, perceived empathy, and even names or personalities (Araujo, 2020). This shifts the user's perception of AI from a mere computational tool to a social agent or teammate (Nass and Moon, 2000). In academic libraries, this phenomenon is increasingly relevant as AI-powered tools like chatbots, virtual assistants, and recommendation systems become embedded in-service delivery. AI anthropomorphism is often linked to enhanced user engagement, trust, and perceived intelligence (Li and Suh, 2022). When users perceive AI tools as more human-like, they are more likely to interact with them intuitively, expecting empathy, responsiveness, and contextual understanding--key elements in user-centered library services. For instance, AI chatbots with anthropomorphic features may improve reference services by simulating conversational warmth and attentiveness (Uysal et al., 2023). However, the conceptualization of anthropomorphism in AI-enabled technologies remains fragmented, with researchers yet to reach a consensus on its operational definitions, leading to varied interpretations across disciplines (Suh and Son, 2021). This ambiguity affects how librarians evaluate the effectiveness and ethical implications of deploying anthropomorphic AI systems.

Published works show that AI can potentially improve efficiencies in reference, cataloguing, and acquisition services (Mabona et al., 2024). Chatbots or robots, for example, can be trained to handle basic user queries that often form the bulk of a reference librarian's workload, as well as simplify information retrieval through automated book sorting and shelving. Additionally, AI can assist in the classification and indexing of information resources. Raghavaiah and Sreekanth (2023) provide practical examples from Singapore, where PERSIST, a robot at the central library, shelves and retrieves books, and Bobbie, developed by Temasek Polytechnic Library, answers frequently asked questions. Such humanoid assistance frees librarians' time to focus on more complex tasks requiring deeper engagement, critical thinking, contextual understanding, empathy, and logic--areas where machines currently do not excel.

The integration of anthropomorphic AI in academic libraries also raises ethical concerns, particularly around transparency, user autonomy, and data privacy. The International Federation of Library Associations and Institutions (IFLA, 2020) emphasizes the need for clear ethical standards when implementing AI, especially in environments where users may not fully understand the nature of machine-human interaction.

The Experiences and Perception of Academic Librarians of AI Anthropomorphism

The increasing integration of artificial intelligence into academic libraries has prompted growing interest in how librarians perceive and experience AI anthropomorphism. This phenomenon plays a critical role in shaping user interactions, trust, and acceptance of AI tools within library environments (Li and Suh, 2022). Academic librarians often encounter AI through applications such as chatbots, virtual assistants, and automated recommendation systems, which are frequently designed with anthropomorphic features to simulate human-like engagement, including conversational tone, emotional responsiveness, and adaptive learning behaviors (Uysal et al., 2023). Librarians' experiences with such systems are shaped not only by their functionality but also by the perceived "human-ness" of the interface, which influences their comfort level, expectations, and ethical concerns.

Perceptions of AI anthropomorphism among librarians vary widely. Some view it as a strategic enhancement that improves user experience and service delivery, particularly in reference and circulation services (Suh and Son, 2021). Others express skepticism, citing concerns about misleading representations, over-reliance on automation, and the erosion of human-centered values in librarianship (Filson and Atuase, 2024). These tensions reflect broader debates about the role of empathy, judgment, and professional discretion--qualities that anthropomorphic AI may mimic but not authentically possess.

Lund et al. (2020) investigated perceptions toward artificial intelligence among academic library employees and their alignment with the diffusion of innovations' adopter categories. The study surveyed practicing librarians regarding the adopter category with which they identify and the relationship of this identification with their perceived knowledge and perceptions of AI technology. The findings revealed that a majority of respondents perceived AI as a potential threat to their employment, yet also believed it could improve their lives and enhance library services.

The Applications of AI Anthropomorphism in Academic Libraries for Web-based Service Delivery

The integration of artificial intelligence into academic libraries has transformed the landscape of web-based service delivery, with anthropomorphism emerging as a strategic design element. For instance, AI-powered chatbots embedded on library websites often employ natural language processing and human-like avatars to replicate the experience of speaking with a librarian. This not only improves service accessibility but also fosters a sense of connection and reliability, especially in asynchronous or remote learning contexts (Suh & Son, 2021). Academic libraries have adopted these technologies to streamline operations and extend service hours, offering 24/7 support through AI-driven platforms. Zondi et al. (2024) highlight that anthropomorphic AI tools can reduce staff workload while maintaining consistent service quality. However, their effectiveness depends on the degree to which users perceive the AI as competent, relatable, and trustworthy--qualities often enhanced through anthropomorphic design.

As Adejo and Misau (2021) examined the application of artificial intelligence in academic libraries in Nigeria using a qualitative research method. The study explored how AI could be used in Nigerian academic libraries, revealing potential applications in expert systems for reference

services, technical services, indexing, acquisition, natural language processing, pattern recognition, and robotics. The study recommended that academic libraries in Nigeria embrace AI in their operations and that library staff be trained accordingly. Therefore, AI anthropomorphism offers promising applications for enhancing web-based service delivery in academic libraries. When thoughtfully designed and ethically implemented, these technologies can improve user experience, extend service reach, and support the evolving digital transformation of libraries.

The Perceived Benefits of AI Anthropomorphism in Academic Libraries for Web-based Service Delivery

A primary perceived benefit of AI anthropomorphism is its ability to simulate human interaction, making digital services more relatable and intuitive. In academic libraries, AI-powered chatbots and virtual assistants often employ conversational language, emotional cues, and personalized responses to mimic human librarians. This human-like interaction has been shown to increase user satisfaction and engagement, particularly in reference services and information retrieval tasks (Uysal et al., 2023). Chen et al. (2024) noted that the perceived benefits of artificial intelligence include helping modern libraries reach their potential in the digital era, enabling accurate services, assisting in metadata creation for digital resources, and allowing cataloguing to increase both the speed and depth of metadata generation. Many academic libraries are deploying artificial intelligence, while others have plans to do so to maximize these benefits (Chen et al., 2024).

Schreur (2020) reported that library technical services have historically benefited from technological transitions. Although initially met with suspicion, shifts such as the move from catalogue cards to MARC formats have proven enormously helpful. Linked data and artificial intelligence hold similar promise. By converting metadata to linked open data, libraries can represent their resources on the Semantic Web. However, to provide controlled access to unstructured data, libraries must reach beyond traditional cataloguing to new tools like AI to ensure consistent access to a growing world of full-text resources. Therefore, the perceived benefits of AI anthropomorphism in academic libraries include enhanced user engagement, increased trust, scalable service delivery, and improved accessibility. When thoughtfully designed and ethically implemented, these technologies can significantly enrich web-based library services and support the digital transformation of academic institutions.

The Challenges and Ethical Considerations for Implementing AI Anthropomorphism in Academic Libraries

The path to adopting AI in academic libraries is fraught with challenges and ethical considerations. Some challenges are unique to developing countries, while others are global. Limited capacity, inadequate funding, and insufficient AI infrastructure are often cited as major barriers. Fear of job loss and unstable power supply are also significant concerns in developing countries (Omame and Alex-Nmecha, 2020; Oyetola et al., 2023; Raghavaiah and Sreekanth, 2023).

Owobabi et al. (2021) examined the readiness of academic librarians toward the use of robotic technologies in Southwestern Nigerian university libraries. The study assessed the levels of readiness, policy frameworks, and human development for robotics adoption, as well as awareness of its potential benefits. Using a survey research design and a questionnaire, 100

academic librarians from ten universities were purposively selected. The findings revealed that readiness for the adoption and use of robotic technologies in Nigerian university libraries is not particularly widespread or enthusiastic. Another pressing challenge is staff capacity and digital literacy. Librarians often lack formal training in AI technologies, making it difficult to manage, evaluate, or ethically implement anthropomorphic systems (Filson and Atuase, 2024). Without adequate professional development, librarians may be ill-equipped to address user concerns, troubleshoot AI behavior, or ensure responsible use.

Ethical considerations are central to the discourse on AI anthropomorphism. IFLA (2020) emphasizes the need for transparency, accountability, and user consent when deploying AI in library settings. Anthropomorphic AI systems, by mimicking human behavior, may mislead users into believing they are interacting with real people, raising concerns about deception, autonomy, and informed decision-making (Suh and Son, 2021). Privacy and data protection also pose significant ethical challenges. AI systems often rely on user data to personalize responses and improve performance. However, anthropomorphic interfaces may obscure the extent of data collection, leading to potential breaches of confidentiality and misuse of sensitive information (Li & Suh, 2022). Academic librarians must navigate these risks while upholding core values of intellectual freedom and user privacy.

Much of the academic library literature on AI anthropomorphism is exploratory and conceptual, with limited discussion of practical implementations. This study goes beyond theoretical discourse to provide compelling evidence of how AI anthropomorphism is currently integrated in academic libraries across Nigeria's geopolitical zones. A limited number of studies were found on the application of AI anthropomorphism in academic libraries, especially in the Global South (Africa and Nigeria). While Chen et al. (2024) reported on the benefits of AI for library services, their study did not specifically examine the benefits of AI anthropomorphism from the perspective of system librarians. Similarly, studies by Adejo and Misau (2021), Uysal et al. (2023), Omame and Alex-Nmecha (2020), Oyetola et al. (2023), and Raghavaiah and Sreekanth (2023) examined various aspects of AI anthropomorphism in the Global North, but to the best of the researcher's knowledge, no corresponding research has been conducted in the Global South, particularly in Nigeria's six geopolitical zones. It is hoped that this research will serve as a prelude to further studies, outlining the experiences, perceptions, applications, challenges, and ethical considerations of AI anthropomorphism in academic libraries from the perspective of system librarians in Nigeria.

RESEARCH METHODOLOGY

This study adopted a phenomenological qualitative research design to explore the perceptions and experiences of system librarians in Nigeria regarding the integration of AI anthropomorphism in academic libraries during the Fourth Industrial Revolution. The phenomenological approach was selected for its strength in investigating lived experiences, making it ideal for understanding how library professionals interpret, experience, and integrate AI tools into their daily workflows and institutional culture. The qualitative nature of the study was particularly suited to uncovering the complex professional, institutional, and motivational factors influencing AI anthropomorphism integration, while also identifying key opportunities to promote greater visibility within and outside the library sector.

The study population consisted of 1,103 LIS professionals from universities across Nigeria's six geopolitical zones (North-Central, North-East, North-West, South-East, South-South, and South-West), as listed in the National Association of Library and Information Science Educators Handbook (2024). This nationwide scope ensured the inclusion of diverse professional experiences and regional perspectives.

A purposive sampling technique was employed to select participants with significant expertise and direct involvement in ICT units. One senior system librarian was selected from each geopolitical zone, resulting in a sample size of six participants. While small, this sample was appropriate for a phenomenological study, prioritizing in-depth understanding over generalizability and enabling detailed comparative analysis of professional experiences.

Data were collected through a Focus Group Discussion (FGD), chosen for its ability to stimulate dialogue and collective reflection. The FGD is highly effective for exploring shared professional challenges and social meanings, allowing participants to build upon each other's insights. A semi-structured interview guide was used to steer the conversation around key themes while allowing for flexibility. The guide covered:

- a) The meaning of AI anthropomorphism in academic libraries.
- b) The experiences and perceptions of academic librarians regarding AI anthropomorphism.
- c) The applications of AI anthropomorphism in academic libraries for web-based service delivery.
- d) The perceived benefits of AI anthropomorphism in academic libraries for web-based service delivery.
- e) The challenges and ethical considerations faced by academic librarians in implementing AI anthropomorphism.

The FGD was conducted online via Zoom in September 2025 to accommodate participants' geographic dispersion and busy schedules. The session lasted approximately one hour and thirty-nine minutes. Prior to the discussion, participants received a clear explanation of the study's aims and provided electronic informed consent. The session was audio-recorded with permission to ensure data accuracy.

Ethical guidelines were strictly followed: participants' identities were protected through pseudonyms, their data was kept confidential, and they were informed of their right to withdraw at any time without consequence. The audio recording was transcribed verbatim using [Otter.ai](#) (version 3.4) and manually verified against the original recording for accuracy.

Data analysis involved a thematic approach. The transcript was reviewed multiple times to gain a deep understanding of the content. Significant statements and meanings were identified and grouped into emerging themes. To ensure trustworthiness, member checking was conducted; participants reviewed the transcript and a summary of the initial themes to confirm their accuracy and relevance. Reflexive notes were maintained throughout the analysis process, and all analytical decisions were documented. Providing rich, detailed descriptions of the participants and context ensures the study's findings are grounded in the actual experiences of the professionals involved.

FINDINGS

This section presents the findings of the study, analyzed thematically to illuminate the lived experiences of system librarians regarding the implementation and implications of AI anthropomorphism in web-based service delivery. The findings are structured around four key themes derived from the focused group discussions: experiences and perceptions, applications, perceived benefits, and challenges and ethical considerations.

Experiences and Perceptions of AI Anthropomorphism

Participants shared a wide range of experiences and perceptions regarding the use of anthropomorphic AI. Initial reactions were often marked by curiosity and intrigue, followed by a blend of optimism, caution, and ethical reflection as they observed user interactions with AI systems designed to mimic human traits.

For instance, a participant (SysLib SE) recounted:

"When we first introduced an AI chatbot with a human-like name and personality, patrons started treating it like a real staff member. They'd thank it, ask about its 'day,' and even share personal frustrations. It was eye-opening--how quickly people project humanity onto machines."

Another (SysLib NC) added a cautionary note:

"There's a fine line between making AI relatable and misleading users. Some patrons don't realize they're interacting with a machine until they hit a complex query. That's when trust issues arise."

A participant (SysLib AB) observed generational differences:

"Younger users are more comfortable with anthropomorphic features--they treat the AI like a peer. But older patrons often prefer traditional interfaces or direct human contact. Some even feel uncomfortable when the AI 'talks' too casually."

Another (SysLib KT) reflected on emotional engagement:

"We had a student who kept returning to the chatbot just to 'chat.' It wasn't about library services anymore--it became a kind of digital companionship. That raised questions for us about emotional boundaries and expectations."

Another (SysLib RM) emphasized the role of anthropomorphism in lowering communication barriers:

"Students who were hesitant to approach staff in person--especially those with social anxiety--found it easier to interact with the AI. They felt less judged and more in control of the conversation."

Collectively, these insights reveal that anthropomorphic AI can foster deeper engagement and emotional connection, but also introduce risks related to user misunderstanding, misplaced trust, and blurred boundaries between human and machine. The generational divide further highlights the need for adaptive design strategies that accommodate diverse user preferences.

Applications of AI Anthropomorphism in Academic Libraries for Web Based Service Delivery

System librarians identified a variety of applications where anthropomorphic AI significantly enhanced web-based service delivery. These implementations leveraged human-like traits--such as conversational tone, emotional cues, and persona-driven interactions--to improve engagement, accessibility, and efficiency.

For example, a participant (SysLib SW) explained:

"We integrated a persona-driven AI into our library app. It doesn't just answer questions--it suggests resources based on past interactions and even uses emojis to make the exchange feel more human."

Another (SysLib SS) shared:

"During orientation, we use an AI character to introduce library services. It's more engaging than a video or PDF, and retention rates have improved."

A participant (SysLib MA) noted:

"Our AI tutor helps students navigate citation tools and databases. It responds in a conversational tone, which makes the learning process less intimidating."

Another (SysLib KO) added:

"We use an AI chatbot that remembers user preferences. It recommends articles and journals based on previous queries, almost like a peer suggesting what to read next."

Another (SysLib ZL) highlighted accessibility benefits:

"For visually impaired users, our voice-enabled AI provides spoken guidance through the website. It even adjusts its tone based on user feedback, making the experience more personalized."

These examples demonstrate how anthropomorphic AI can be strategically deployed to enhance service delivery, foster deeper engagement, and support diverse user needs, creating more intuitive and inclusive digital environments.

Perceived Benefits of AI Anthropomorphism in Academic Libraries

Participants acknowledged a range of benefits associated with anthropomorphic AI systems, which improved user engagement, accessibility, and operational efficiency. The personalization and relatability of AI interfaces appeared to lower psychological barriers, especially for users hesitant to seek help through traditional channels.

For instance, a participant (SysLib NE) stated:

"Our chat service usage tripled after we gave the AI a name and a friendly tone. Students who were hesitant to ask 'silly questions' to a librarian felt comfortable asking the AI."

Another (SysLib NW) added:

"It's not just about answering questions--it's about building a digital relationship. That leads to higher satisfaction and better service outcomes."

A participant (SysLib BA) observed:

"We noticed that students with social anxiety were more likely to engage with the AI than with staff. It gave them a sense of control and privacy."

Another (SysLib OM) shared:

"The AI's ability to remember user preferences and respond in a conversational tone made it feel like a personalized assistant. That's something we couldn't offer at scale with human staff."

Another (SysLib JD) emphasized:

"During exam season, the AI handled hundreds of queries daily. It freed up our team to focus on more complex support while ensuring students still got timely help."

These insights suggest that anthropomorphic AI not only enhances functional service delivery but also contributes to a more inclusive and emotionally supportive digital environment, fostering trust and reducing intimidation.

Challenges and Ethical Considerations

Despite the perceived benefits, system librarians expressed significant concerns regarding implementation, particularly relating to user expectations, data ethics, professional identity, and algorithmic fairness. These challenges underscore the need for thoughtful design, transparent communication, and robust policies.

For example, one participant (SysLib SE) cautioned:

"We must be transparent about what's AI and what's human. When users can't tell the difference, we risk eroding trust--not just in the tool, but in the library as an institution."

Another (SysLib NC) emphasized:

"Ethical design is non-negotiable. We need clear policies on data use, accountability, and when to escalate to a human. Without that, we're building systems that may exclude or mislead."

A participant (SysLib YK) reflected on emotional manipulation:

"Some users form emotional bonds with the AI, thinking it understands them. That's dangerous if we don't clarify its limitations. We're not just designing tools--we're shaping perceptions."

Another (SysLib MT) raised concerns about digital exclusion:

"Not all users are comfortable with AI. If we push too hard, we risk alienating those who prefer human contact or lack digital literacy. Inclusivity must guide our decisions."

Another (SysLib DA) highlighted data ethics:

"We collect a lot of behavioral data to personalize responses. But are users truly aware of what's being stored? We need to rethink consent--not just as a checkbox, but as an ongoing conversation."

These insights underscore the importance of embedding ethical principles into the design and deployment of anthropomorphic AI, ensuring that technological innovation enhances rather than compromises the profession's core values.

DISCUSSION OF FINDINGS

This study explored the lived experiences, perceptions, and strategic approaches of system librarians regarding the integration of anthropomorphic AI in academic libraries for web-based service delivery. The emergent themes reveal a complex interplay between promising technological benefits, profound ethical challenges, and an urgent need for adaptive, human-centered design. These findings resonate with broader discourses in human-computer interaction while offering critical, context-specific insights from the front lines of library service innovation.

A prominent finding was the powerful impact of anthropomorphic design on user engagement and accessibility. Participants described a spectrum of experiences, with initial reactions marked by curiosity and intrigue, followed by a blend of optimism and caution. The immediate projection of humanity onto machines--as recounted by one participant who observed patrons thanking the AI and sharing personal frustrations--strongly aligns with the Computers Are Social Actors (CASA) paradigm. This foundational theory posits that individuals instinctively apply social norms to computers; a phenomenon library can strategically leverage to enhance service delivery. Another participant noted that anthropomorphic AI significantly lowered

communication barriers for hesitant or anxious users, leading to a tripling of chat service usage as students felt more comfortable asking "silly questions." This benefit extends beyond functional service delivery into psychological accessibility, fostering a more inclusive digital environment. These findings align with earlier work by Uysal et al. (2023) and Filson and Atuase (2024), who emphasized both the potential and the skepticism surrounding anthropomorphic AI, citing concerns about misleading representations, over-reliance on automation, and the erosion of human-centered values.

However, this very strength introduces a critical vulnerability: the risk of eroded trust and ethical complications. A cautionary note from one participant about the "fine line between making AI relatable and misleading users" highlights a core challenge in trust calibration. When the human-like façade collapses in response to a complex query, user frustration can undermine trust not only in the AI system but, as another participant warned, in the library as an institution. This risk is further compounded by the potential for emotional dependency, illustrated by a participant's account of a student seeking "digital companionship." Such cases raise urgent ethical questions about emotional manipulation and the boundaries of the library's role, echoing concerns in the literature about the potential for AI to exploit user loneliness. These findings are consistent with Lund et al. (2020), who examined academic library employees' perceptions of AI and its alignment with the diffusion of innovations theory.

The study also revealed strategic applications of anthropomorphic AI and a distinct generational divide in user acceptance. System librarians identified key areas where anthropomorphism enhanced service delivery, including persona-driven resource discovery, engaging orientation tools, and accessible voice-enabled guides. However, the observation of a generational divide--with younger users treating AI as a peer and older patrons preferring human contact--underscores the limitations of a one-size-fits-all approach. This finding necessitates adaptive design strategies that accommodate diverse user preferences, ensuring that innovation does not alienate those who favor traditional service models. These insights align with Zondi et al. (2024), who highlighted that anthropomorphic AI tools can reduce staff workload while maintaining consistent service quality. Nevertheless, the effectiveness of these applications depends on users' perceptions of the AI's competence, relatability, and trustworthiness--qualities often enhanced through anthropomorphic design.

Furthermore, the findings point to systemic operational and ethical barriers that mirror challenges in other domains of technological adoption. Inadequate policies on data ethics, transparency, and accountability were frequently cited as significant hurdles. One participant raised concerns about behavioral data collection and the need for meaningful consent, while another emphasized that "ethical design is non-negotiable." These reflections underscore that implementation is not merely a technical task but a socio-technical endeavor. Academic libraries must develop robust institutional frameworks to govern these systems, ensuring that the pursuit of efficiency and engagement does not compromise core professional values such as privacy, equity, and trust. This aligns with IFLA (2020), which emphasized the importance of transparency, accountability, and user consent in AI deployment. Similarly, Suh and Son (2021) cautioned that anthropomorphic AI systems, by mimicking human behavior, may mislead users into believing they are interacting with real people--raising concerns about deception, autonomy, and informed decision-making.

Despite these challenges, the study revealed a strong sense of agency and strategic pragmatism among participants. The perceived benefits--such as operational efficiency and personalized service at scale--demonstrate the tangible value of these systems. The collective insights suggest a balanced path forward: one that neither fully embraces nor rejects anthropomorphism, but instead consciously designs it with clear boundaries, transparency, and human oversight. This approach ensures that AI serves as a tool to enhance, rather than replace, the human-centric mission of the academic library, creating more accessible and responsive services while safeguarding user well-being and institutional integrity. These findings align with recommendations by Chen et al. (2024), who noted that AI helps modern libraries reach their potential in the digital era by enabling accurate service delivery, supporting metadata creation, and enhancing cataloguing processes. Such practices echo Schreur (2020), who reported that library technical services have historically benefited from technological transitions--such as the shift from catalogue cards to MARC formats--which, though initially met with skepticism, ultimately proved invaluable.

CONCLUSIONS

This study has illuminated the complex reality of integrating AI anthropomorphism into academic libraries, revealing it to be a powerful yet double-edged innovation. On one hand, anthropomorphic AI demonstrably enhances web-based service delivery by fostering deeper user engagement, lowering barriers to access for hesitant patrons, and operating with a personalized efficiency that can scale to meet user demand. The human-like traits of these systems--from conversational tones to personalized memory--create intuitive and supportive digital environments that can effectively supplement human services.

However, these significant benefits are counterbalanced by substantial ethical and practical challenges. The very human-like qualities that promote engagement also risk fostering user misunderstanding, misplaced trust, and potential emotional dependency. Issues of data ethics, algorithmic transparency, and the risk of alienating users who prefer human interaction or lack digital literacy underscore the profound responsibility involved in deploying such technology.

Therefore, the successful integration of AI anthropomorphism in libraries cannot be measured solely by its technical capabilities or user engagement metrics. Ultimately, its value hinges on a commitment to human-centered design, unwavering transparency, and robust ethical guidelines. The goal is not to create the perfect human replica, but to leverage anthropomorphic features thoughtfully to augment library services, ensuring that this powerful technology ultimately strengthens, rather than compromises, the library's role as a trusted and inclusive human-centered institution.

Based on the findings and conclusions of the study, the academic libraries, in collaboration with national and regional library associations, should develop comprehensive ethical frameworks for the deployment of anthropomorphic AI. These policies must explicitly address transparency (clearly identifying AI interactions), data privacy, user consent, and accountability mechanisms for AI-driven decisions.

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