SSJ PUBLICATIONS

Journal of Entrepreneurship and Global Economic Leadership

ISSN-3143-8822

Research Article

Artificial Intelligence and Chatbots in Enhancing User Services in the 21st Century Libraries: Evidence from Selected Libraries in South, Nigeria

Iyishu V. A[1*]

[1]*CLN Cross River University of Technology Library, Calabar, Nigeria*

***Correspondence:** Iyishu V. A, CLN Cross River University of Technology Library, Calabar, Nigeria; E-mail: iyishuvictoria@gmail.com

Received date: 04 Aug 2025: Accepted date: 18 Aug 2025: Published date: 28 Aug 2025

Citation: Iyishu V. A (2025). "Artificial Intelligence and Chatbots in Enhancing User Services in the 21st Century Libraries: Evidence from Selected Libraries in South, Nigeria" *Journal of Entrepreneurship and Global Economic Leadership*, 1(2):108.

Abstract

The 21st century has witnessed a profound transformation in how information is created, accessed, and shared, largely driven by the proliferation of digital technologies, social media, and Artificial Intelligence. While these developments have expanded access to information, they have also given rise to information disorder, including misinformation and disinformation, which threatens informed decision-making, public trust, and digital citizenship. Libraries, as trusted institutions for information provision and literacy, are uniquely positioned to respond to these challenges, but they must reposition their services to remain relevant in a digital and AI-driven environment. This study examined the role of Artificial Intelligence and chatbots in enhancing user services in 21st century libraries, with evidence drawn from selected academic and public libraries in South, Nigeria, including institutions in Cross-River, Rivers, Delta, Edo, Bayelsa, and Akwa Ibom States. The study adopted a descriptive survey design and explored how AI and chatbot technologies are being used to address user needs, combat misinformation, and promote Media and Information Literacy and digital citizenship. Findings from the review and selected case evidence revealed that selected libraries in South Nigeria have begun to deploy basic chatbots and AI-enabled discovery tools to provide instant responses to user enquiries, guide users to verified information, and extend services beyond physical opening hours. Users reported increased satisfaction and improved access to library resources as a result of these interventions. However, the study also identified significant challenges including poor ICT infrastructure, limited staff capacity, inadequate funding, and lack of localized content in English, Pidgin English, and local languages. Furthermore, while information literacy instruction and digital citizenship education are recognized as critical

SSJ PUBLICATIONS
Journal of Entrepreneurship and Global Economic Leadership
ISSN-3143-8822

Research Article

strategies, they remain largely ad-hoc and are yet to be fully integrated with AI tools. The study concluded that Artificial Intelligence and chatbots have substantial potential to transform library services in South Nigeria by making them more responsive, intelligent, and educational. To realize this potential, libraries must invest in infrastructure, build staff capacity, develop localized and verified content, integrate Media and Information Literacy into all digital services, and advocate for policy support at state and national levels. The study recommends that government, library management, and professional associations collaborate to provide funding, training, and policy frameworks that will enable libraries to fully harness AI and chatbots to enhance user services, combat misinformation, and promote responsible digital citizenship in the 21st century.

Keywords: Artificial Intelligence, Chatbots, Libraries, User Services, Media and Information Literacy, Digital Citizenship, Misinformation, South Nigeria.

Introduction

The role of libraries in the 21st century has been redefined through the rapid integration of digital technologies, and this redefinition has placed enormous pressure on libraries to deliver services that are immediate, personalised, and accessible beyond the physical walls of the library building. For centuries, libraries functioned primarily as custodians of print collections where users had to visit in person during stipulated hours to consult materials or to seek assistance from librarians, but the emergence of the internet, mobile devices, and Artificial Intelligence has fundamentally altered these expectations [1]. Contemporary users, especially students and young professionals in South Nigeria, now expect the same speed and convenience from library services that they experience on commercial platforms such as Google, ChatGPT, and social media, and this shift in expectation has compelled libraries to explore intelligent systems that can respond to enquiries in real time and guide users through complex information environments.

Artificial Intelligence refers to computer systems that can perform tasks associated with human intelligence such as learning from data, understanding natural language, and making decisions, and within library practice one of the most practical manifestations of AI is the chatbot [2]. A chatbot is an AI-powered conversational agent that interacts with users through text or voice to answer questions, provide recommendations, and direct users to appropriate resources, and its relevance to libraries lies in its capacity to provide round-the-clock support without the constraints of staff availability. Research from academic libraries in Asia and North America shows that chatbots have been deployed to handle reference questions, assist with database searching, and deliver library orientation, and the outcomes reported include reduced waiting time, improved user satisfaction, and increased use of electronic resources [3]. The underlying logic is that routine and repetitive enquiries can be managed by automated systems while professional librarians concentrate on higher-order tasks such as research consultation and information literacy instruction.

In the Nigerian context, and particularly in the South region which comprises Cross-River, Rivers, Delta, Edo, Bayelsa, and Akwa Ibom States, libraries are

SSJ PUBLICATIONS
Journal of Entrepreneurship and Global Economic Leadership
ISSN-3143-8822
Research Article

operating within an information environment that is characterized by high mobile penetration and heavy reliance on social media for information. According to the National Bureau of Statistics [4], Nigeria had over 122 million internet users in 2023, and a significant proportion of these users access information through WhatsApp, Facebook, and other messaging platforms. This digital reality has direct implications for libraries because users who are accustomed to instant messaging expect libraries to provide similar channels for support and enquiry. Several academic and public libraries in South Nigeria have responded to this reality by experimenting with technology-enhanced services, and the evidence from institutions such as the University of Calabar Library and the University of Port Harcourt Library indicates that there is growing interest in AI tools to improve access and engagement [5, 6].

The COVID-19 pandemic further exposed the limitations of traditional service models and accelerated the need for remote and automated support systems in Nigerian libraries. During lockdowns, physical access to library buildings was restricted, and users depended entirely on online platforms for information, yet many libraries in the South region lacked interactive systems that could respond to users outside official working hours [7]. This experience highlighted the value of chatbots as a tool for continuity of service, because an AI chatbot can remain active on a library website or WhatsApp line and provide answers on registration, e-resource access, and opening hours even when librarians are not online. Beyond operational efficiency, there is also a critical information literacy dimension to this discussion, because the South region, like other parts of Nigeria, has experienced widespread circulation of misinformation on health, politics, and governance through social media channels [8]. Libraries, by virtue of their mandate to provide reliable information, are well positioned to use AI systems to direct users to authoritative sources and to model critical evaluation skills.

Evidence from selected libraries in South Nigeria suggests that initial steps have already been taken toward the integration of AI and chatbots, although the scale and sophistication vary across institutions. The University of Calabar Library introduced a basic chatbot on its website and an official WhatsApp contact to respond to frequently asked questions, and preliminary feedback indicates that students appreciate the immediacy of responses, especially during admission and registration periods [9]. Similarly, the Cross-River University of Technology Library has deployed an automated response system that guides users on how to access e-journals and institutional repository materials, and this has contributed to increased traffic to electronic resources. In Rivers State, the University of Port Harcourt Library implemented an AI-enabled discovery tool that analyses user search patterns and recommends relevant scholarly materials, and this tool has been useful in helping undergraduate students to identify credible academic sources and to avoid predatory journals [6]. These examples demonstrate that despite infrastructural constraints, there is existing practice and willingness within the region to explore intelligent systems for user service enhancement.

Nevertheless, the full potential of AI and chatbots in South Nigerian libraries has not been realised, and

SSJ PUBLICATIONS
Journal of Entrepreneurship and Global Economic Leadership
ISSN-3143-8822
Research Article

several factors continue to shape the pace of implementation. Infrastructure remains a major constraint because irregular power supply and limited broadband access in some local government areas affect the reliability of online services [2]. There is also the challenge of human capacity, since many library staff have not received formal training in AI application, chatbot management, and data analytics, and this creates dependence on external vendors. In addition, content development for chatbots in the Nigerian context requires attention to language and context, because effective communication with users in the South region may require the integration of English, Pidgin English, and local languages to ensure inclusivity and comprehension. Without addressing these factors, there is a risk that chatbot services will remain superficial and will not achieve the intended impact on user experience.

The significance of AI and chatbots for 21st-century libraries in South Nigeria therefore lies in their potential to transform service delivery from reactive to proactive, and from location-bound to ubiquitous. When properly designed, AI systems can analyse user queries to identify gaps in library collections, they can personalise recommendations based on user behaviour, and they can provide data that library management can use for decision-making [3]. More importantly, chatbots can serve as the first point of contact for users who are hesitant to approach librarians physically, and this can reduce barriers to access for students, researchers, and community members. Given that libraries are still regarded as trusted institutions, the introduction of AI must be accompanied by a commitment to accuracy and to the promotion of credible information, and this aligns with the broader goal of positioning libraries as key actors in the fight against information disorder in the digital age [10].

In light of these developments, it is necessary to document and analyse the current state of AI and chatbot deployment in selected libraries in the South, Nigeria, to understand how these technologies are being used to enhance user services, to identify the challenges that limit their effectiveness, and to propose strategies for scaling their use. This study therefore focuses on selected academic and public libraries in the South region to provide empirical evidence on the extent of integration, user perceptions, and institutional readiness for AI-driven library services in the 21st century.

Statement of the problem

The 21st century library is no longer judged by the size of its book collection or the quietness of its reading hall, but by how quickly and intelligently it responds to the needs of users who now live in a digital-first world. In South Nigeria, students, researchers, and community members have moved their information seeking online, and they expect libraries to provide answers at any time of the day, to guide them through overwhelming digital resources, and to help them separate credible information from the noise of social media. Unfortunately, most selected libraries in the South region are still operating with service models that were designed for a pre-digital era, where reference desks close at 4 pm, enquiries are answered days later through email, and users are left to navigate databases and e-resources on their own without any form of intelligent guidance. This gap has become more visible since the COVID-19 pandemic forced

SSJ PUBLICATIONS
Journal of Entrepreneurship and Global Economic Leadership
ISSN-3143-8822
Research Article

libraries to close their physical doors and revealed how unprepared many institutions were to serve users remotely, and even now that libraries have reopened, the demand for instant, 24/7 support has not disappeared. At the same time, users in Cross-River, Rivers, Delta, Edo, Bayelsa, and Akwa Ibom States are being bombarded daily with misinformation on WhatsApp, Facebook, and TikTok about health, politics, and education, and they are turning to libraries for trusted direction, yet many libraries lack the intelligent tools needed to respond at scale. Artificial Intelligence and chatbots present a clear opportunity to bridge this gap because they can provide instant answers, personalised recommendations, and continuous access to library services without increasing staff workload. However, evidence from selected libraries in South Nigeria shows that the deployment of AI and chatbots is still fragmented, underfunded, and poorly integrated into core library services, with many chatbots limited to answering basic questions about opening hours while ignoring deeper user needs such as research support, resource discovery, and misinformation navigation. Compounding this problem is the reality of poor digital infrastructure, limited technical capacity among library staff, and the absence of localised content that speaks to the language and context of users in the South region, which means that even where chatbots exist, they are often ineffective and quickly abandoned. The consequence of this is that libraries risk becoming irrelevant to the very generation they are meant to serve, because users will continue to bypass them for Google and AI tools that respond faster, even if those tools are not always accurate or trustworthy. Therefore, the central problem this study addresses is that while Artificial Intelligence and chatbots have the capacity to transform user services in 21st-century libraries, selected libraries in South Nigeria have not fully harnessed this potential, and without a clear understanding of current practices, challenges, and user expectations, libraries will continue to lag in delivering the intelligent, responsive, and inclusive services that users now demand.

Understanding Misinformation and Digital Citizenship in the Social Media Era

The nature of information disorder

The digital environment of the 21st century has created a paradox in which information has never been more accessible and yet never more difficult to trust, because the same platforms that allow for instant communication and knowledge sharing have also become channels through which falsehoods spread with remarkable speed and reach. Scholars have moved away from the simplistic label of "*fake news*" and now describe this problem as "*information disorder*," a term that captures the complexity of false and misleading content that circulates across social media, messaging apps, and other digital spaces. Information disorder is broadly categorized into three distinct but overlapping forms, and understanding these distinctions is important because each type requires a different kind of response from institutions such as libraries.

The first form is misinformation, which refers to false or inaccurate information that is shared without the intention to cause harm, and this often happens when

SSJ PUBLICATIONS
Journal of Entrepreneurship and Global Economic Leadership
ISSN-3143-8822
Research Article

well-meaning individuals forward messages, videos, or articles that they believe to be true but which have not been verified. The second form is disinformation, which is false information that is deliberately created and disseminated with the specific intent to deceive, manipulate public opinion, or cause division, and this is commonly associated with political actors, commercial interests, and organized groups that use digital tools to influence behavior. The third form is mal-information, which involves genuine information that is shared to cause harm, such as the leaking of private documents, the use of personal images out of context, or the targeted harassment of individuals through the selective release of facts. What makes information disorder particularly dangerous in the social media era is the speed at which content can be replicated and the way algorithms amplify emotional and sensational material over factual and nuanced content.

Social media platforms are designed to maximize engagement, and posts that provoke anger, fear, or surprise are more likely to be shared and promoted, which means that false narratives often outperform accurate information in terms of visibility and reach. In addition, the cost of producing content has collapsed, such that any individual with a smartphone can create and distribute multimedia messages to thousands of people without editorial oversight, and this has removed the traditional filters that once existed in newspapers, radio, and television. The result is an environment where users are constantly exposed to competing claims and where the line between fact and fiction becomes increasingly blurred. The consequences of information disorder extend far beyond individual confusion, because when citizens cannot distinguish between credible and misleading information, their ability to make informed decisions about health, education, governance, and community life is severely compromised.

In the context of public health, for example, false claims about treatments or vaccines can lead to hesitancy and prevent people from accessing essential services, while in the political sphere, doctored images and fabricated endorsements can undermine trust in democratic processes and institutions. For libraries, which have historically positioned themselves as trusted providers of reliable information, information disorder represents both a challenge and an opportunity, because the institution must now compete with a flood of unverified content while also asserting its role as a guide that helps users to navigate and make sense of the digital landscape. This is where technologies such as Artificial Intelligence and chatbots become relevant, because they can be programmed to provide instant clarification, direct users to authoritative sources, and model the kind of critical evaluation that users need to survive in an information-saturated world. The nature of information disorder therefore demands that libraries move beyond collection management and embrace a more active role in information mediation and digital guidance.

The Nigerian and Cross-River state context

Nigeria presents a unique and complex environment for understanding information disorder because the country has experienced one of the fastest rates of digital and mobile penetration in Africa, and this

SSJ PUBLICATIONS
Journal of Entrepreneurship and Global Economic Leadership
ISSN-3143-8822
Research Article

growth has not been matched by a corresponding investment in media and information literacy or in the institutional capacity to manage the consequences of an open digital space. As of 2023, Nigeria had an estimated 122.5 million internet users, and for a large segment of the population, particularly young people in urban centers, social media platforms have become the primary source of news, political commentary, and community information. WhatsApp, Facebook, X, TikTok, and YouTube dominate everyday communication, and in many communities these platforms function as the de facto public square where issues are debated, rumors are spread, and mobilization occurs. This shift has been especially pronounced during periods of crisis such as the COVID-19 pandemic and election cycles, when the demand for information spikes and the volume of unverified content increases exponentially.

Within this national context, Cross-River State reflects many of the same patterns while also exhibiting characteristics that are specific to the South region of Nigeria. With an estimated population of 3.8 million, Cross-River is home to a mix of urban, semi-urban, and rural communities, with Calabar serving as the administrative and educational hub and towns such as Ikom, Ogoja, and Ugep representing growing centres of mobile internet use. The state has a vibrant civil society, a diverse media landscape, and a young population that is highly active online, and these factors combine to create both opportunities for digital engagement and vulnerabilities to misinformation. During the COVID-19 pandemic, for example, Cross-River experienced widespread circulation of claims about herbal cures, conspiracy theories about vaccines, and misinformation linking new technologies to the spread of the virus, and these narratives contributed to confusion and to a decline in trust in official health communication. Similarly, during the 2019 and 2023 general elections, social media was filled with doctored images, fake endorsements, and ethnically charged messages that were designed to influence voters and to deepen divisions within communities.

The implications of this environment for libraries in Cross-River State are significant, because libraries are traditionally expected to serve as neutral and reliable sources of information, yet many users now bypass libraries entirely and go directly to social media for answers. Academic libraries such as the University of Calabar Library and the Cross-River University of Technology Library serve thousands of students who are digital natives, but these institutions often lack the interactive tools needed to meet users where they are, which is on WhatsApp and other messaging platforms. Public libraries under the Cross-River State Library Board face even greater challenges in terms of funding, infrastructure, and staffing, and as a result their ability to respond to the information needs of the public in real time is limited. This creates a service gap that Artificial Intelligence and chatbots are well positioned to fill, because an AI-powered chatbot can operate on a library's website or WhatsApp line and provide immediate responses to common questions, guide users to verified health and civic information, and extend the reach of the library beyond physical opening hours. In the Nigerian and Cross-River State context therefore, the challenge is not simply one of technology adoption, but of repositioning libraries as relevant and responsive

SSJ PUBLICATIONS
Journal of Entrepreneurship and Global Economic Leadership
ISSN-3143-8822
Research Article

actors in a digital ecosystem that is already saturated with information, much of which is misleading.

Factors driving the spread of misinformation

The spread of misinformation in the social media era is not accidental, but is instead the product of a convergence of technological, psychological, and social factors that together create an environment in which false information thrives and spreads faster than corrections can be issued. The first and perhaps most important factor is the design of social media platforms themselves, because these platforms operate on business models that prioritise engagement and attention over accuracy, and the algorithms that determine what users see are optimised to promote content that generates strong emotional reactions. Posts that are sensational, controversial, or alarming are more likely to receive likes, comments, and shares, and as a result, they are pushed to larger audiences, while factual and balanced content often receives less visibility because it does not generate the same level of interaction. This structural bias means that misinformation has a built-in advantage in the digital ecosystem.

The second factor is the low cost and ease of content production, because in the past the creation and distribution of information required significant resources and institutional backing, but today anyone with a smartphone can record a video, design a graphic, or write a message and distribute it to thousands of people within minutes. This democratisation has many benefits, but it also means that there are fewer gatekeepers and fewer checks on accuracy before information enters the public domain. In Nigeria and in Cross-River State, this is compounded by the popularity of closed messaging groups on WhatsApp, where information circulates within trusted networks and is rarely challenged, which creates echo chambers where the same false claim can be repeated until it is accepted as truth.

The third factor is psychological, because human beings have a natural tendency to believe and share information that confirms their existing beliefs, and this tendency is amplified in online spaces where users are algorithmically sorted into groups with similar views. When people encounter information that aligns with their political, religious, or cultural identity, they are more likely to accept it without scrutiny and to share it with others, and this process is accelerated by the speed and anonymity of digital communication. A fourth factor is the issue of trust, because in many communities in Nigeria there is low confidence in government institutions and traditional media, and as a result people turn to peers, influencers, and community leaders for information, even when those sources are not trained in verification or journalism.

Finally, the digital divide plays a critical role, because while urban areas in South Nigeria have relatively good internet access and exposure to digital literacy programs, rural and semi-urban areas often lack both, which means that the populations most vulnerable to misinformation are also the least likely to have the skills or tools to verify what they see online. For libraries, understanding these drivers is essential, because it clarifies why simple awareness campaigns are not enough and why interventions must be embedded in the platforms and channels where people already spend their time. This is precisely

SSJ PUBLICATIONS
Journal of Entrepreneurship and Global Economic Leadership
ISSN-3143-8822
Research Article

where AI chatbots can play a role, by meeting users in WhatsApp and Facebook Messenger, by providing instant fact-checking, and by modeling critical thinking in ways that are accessible and culturally relevant to users in South Nigeria.

Media and information literacy as a response framework

In response to the growing problem of information disorder, scholars, policymakers, and practitioners have increasingly turned to Media and Information Literacy as a comprehensive framework for equipping individuals with the skills needed to navigate the digital information environment safely and effectively. Media and Information Literacy is not limited to the ability to use technology, but encompasses a broader set of competencies that include the ability to access information, to analyze its source and purpose, to evaluate its credibility, to create and share content responsibly, and to reflect on the impact of one's own digital actions. The framework recognizes that in the 21st century, being literate means more than being able to read and write, it also means being able to think critically about the media messages that shape our understanding of the world and to participate in digital spaces in ways that are ethical and informed.

For libraries, Media and Information Literacy provides a natural extension of their traditional mandate, because libraries have always been concerned with helping users to find, assess, and use information, and the digital age simply expands the scope of that work to include social media, online databases, and AI-powered tools. In practice, this means that libraries must move beyond teaching users how to search a catalogue and must begin to teach them how to spot misinformation, how to verify claims, how to understand the economics of social media, and how to protect their privacy and data. This is particularly important in South Nigeria, where many users acquire their digital skills informally and have not been exposed to formal instruction on how to evaluate online content. Artificial Intelligence and chatbots offer a powerful mechanism for delivering Media and Information Literacy at scale, because they can be designed to interact with users in real time and to guide them through the process of evaluating information. For example, a library chatbot can be programmed to respond to a health-related query by providing a link to NCDC or WHO and by explaining why that source is credible, or it can respond to a political claim by suggesting steps for verification such as reverse image search or checking multiple news outlets. In this way, the chatbot does not simply provide an answer, it models the process of critical thinking and reinforces the principles of Media and Information Literacy with every interaction. Selected libraries in South Nigeria that have begun to experiment with chatbots have reported that users appreciate this kind of guidance, especially students who are conducting research and who are overwhelmed by the volume of information available online.

However, for Media and Information Literacy to be effective, it must be contextualised to the realities of the South region, which means that content must be available in English, Pidgin English, and where possible, local languages, and that examples must reflect the specific misinformation trends that circulate in Cross-River, Rivers, Delta, and neighbouring states. It also requires collaboration

SSJ PUBLICATIONS
Journal of Entrepreneurship and Global Economic Leadership
ISSN-3143-8822
Research Article

between librarians, educators, and technology experts to ensure that chatbot responses are accurate, up to date, and aligned with the needs of the community. When done well, the integration of Media and Information Literacy into library services through AI and chatbots can help to build a more resilient public that is capable of navigating the social media era with confidence, and it can reaffirm the library's role as a trusted institution in the digital age

The Library's role in a post-truth information environment

The 21st century has been described by many scholars as a "*post-truth*" era, not because facts have disappeared, but because the volume of information available to the public has grown so large and so fast that distinguishing between credible evidence and manufactured narratives has become one of the most difficult tasks facing ordinary citizens. In this environment, social media algorithms reward emotion over accuracy, political and commercial actors deliberately create content to manipulate public opinion, and closed messaging groups allow rumours to circulate unchecked within trusted networks until they are accepted as truth. It is within this context that libraries are being called upon to reassert their historical mandate as institutions that organise, preserve, and provide access to reliable information, and to extend that mandate into the digital spaces where most people now spend their time.

Unlike many other institutions, libraries have retained a high level of public trust across cultures and generations, precisely because they have never been aligned with political parties, commercial interests, or ideological movements, and this neutrality gives them a unique legitimacy to intervene in the information disorder that characterises the current era. In a post-truth environment, the library's role cannot be limited to collecting books and journals, because users are no longer asking only "*where can I find this book*" but rather "*how do I know what I am seeing online is true*" and "*who can I trust to guide me through this flood of information.*" This shift in user need requires libraries to move from being passive repositories to becoming active mediators who help citizens to navigate, evaluate, and make sense of digital content. Artificial Intelligence and chatbots are central to this new role because they allow libraries to guide at the point of need and at the scale that the problem demands.

A library chatbot that is available on a website or on WhatsApp can respond instantly when a student asks whether a viral health claim is true, and it can direct the student to NCDC, WHO, or peer-reviewed sources while also explaining the steps that were taken to verify the information. In this way, the chatbot does more than answer a question; it models the process of critical inquiry and reinforces the library's position as a trusted guide. In South Nigeria, where misinformation about health, elections, and governance spreads rapidly through WhatsApp and Facebook, the absence of such intelligent library support means that users are left to rely on their peer networks, many of which lack the training to verify information. By deploying AI tools, libraries in Cross-River, Rivers, Delta, Edo, Bayelsa, and Akwa Ibom States can reposition themselves as the first point of contact for users who are confused or overwhelmed, and in doing so they can help to restore confidence in public institutions. The library's role in a post-truth

SSJ PUBLICATIONS
Journal of Entrepreneurship and Global Economic Leadership
ISSN-3143-8822
Research Article

environment is therefore not simply about fighting falsehoods; it is about building a more informed public that has the skills and the support to think critically, and this is a role that aligns perfectly with the core values of librarianship.

Media and information literacy functions of libraries

Media and Information Literacy refers to the set of competencies that enable individuals to access, analyse, evaluate, create, and communicate information in all its forms, and it has become one of the most important skill sets for citizens living in a digital society where the boundaries between producers and consumers of information have collapsed. Libraries have always been in the business of literacy, but the digital age has expanded that responsibility to include the ability to navigate social media, to understand how algorithms work, to recognise bias in news reporting, and to protect oneself from manipulation and privacy violations. This expanded mandate fits naturally with the professional expertise of librarians, who are trained in information organisation, source evaluation, and instructional design, and it positions libraries as the most logical institutions to lead Media and Information Literacy efforts at the community level.

The first function of libraries in this area is access, because libraries ensure that users have entry points to credible information through databases, e-resources, and curated portals, and in the 21st century this function must extend to digital channels such as websites, social media, and messaging apps where users are already active. The second function is analysis and evaluation, and this is where librarians teach users how to ask critical questions about who created a piece of content, what purpose it serves, and what evidence supports its claims, and AI chatbots can reinforce this by providing instant links to authoritative sources and by prompting users to consider multiple perspectives before accepting a claim as true. The third function is creation and communication, because libraries are increasingly supporting users to become producers of content through digital storytelling, podcasting, and other media, and this requires instruction on ethical sharing and copyright. In South Nigeria, these functions take on particular importance because many students and community members have learned to use smartphones and social media informally, without any structured training in how to evaluate what they see online.

Academic libraries such as those at the University of Calabar and the University of Port Harcourt have begun to integrate Media and Information Literacy into orientation programs and research support, but these efforts are often limited to one-off workshops and do not reach the wider public. Chatbots offer a way to scale these functions because they can deliver micro-lessons, quizzes, and verification tips to thousands of users at the same time, and they can be available outside library hours when most users are online. For public libraries in Cross-River State, Media and Information Literacy functions can be delivered through community programs, school partnerships, and chatbot services that provide daily tips on spotting misinformation, and this approach recognises that literacy is not a one-time event but a continuous practice that must be reinforced. Ultimately, the Media and Information Literacy functions of libraries are about empowerment,

SSJ PUBLICATIONS
Journal of Entrepreneurship and Global Economic Leadership
ISSN-3143-8822
Research Article

because when users are equipped with the skills to evaluate and use information responsibly, they are better able to participate in education, health, governance, and civic life, and this is the ultimate measure of the library's contribution to society.

The library ecosystem in Cross-River state

Cross-River State possesses a diverse library ecosystem that includes academic, public, school, and special libraries, and this ecosystem represents the institutional infrastructure through which Media and Information Literacy and AI-powered services can be delivered to citizens across the state. The academic library sector is anchored by major institutions such as the University of Calabar Library and the Cross-River University of Technology Library, both of which serve large student populations and have made initial efforts to digitise collections and to provide online reference services. These academic libraries are also the sites where most of the experimentation with technology has occurred, including the introduction of basic chatbots on websites and WhatsApp contacts to respond to frequently asked questions about registration, e-resource access, and library orientation.

The public library system in Cross-River State is coordinated by the Cross-River State Library Board, which operates the central library in Calabar and several branch libraries in other local government areas, and while these public libraries face significant challenges in terms of funding, staffing, and infrastructure, they remain important community spaces where people go to read, to access information, and to participate in programs. School libraries exist in many secondary schools across the state, although their level of development varies widely, and there are also special libraries in government ministries, NGOs, and research institutions that serve specific professional communities. What unites this ecosystem is the growing recognition that users expect more than physical collections; they expect digital services that are responsive, intelligent, and available on the platforms they already use.

The introduction of AI and chatbots into this ecosystem has the potential to connect these different types of libraries and to create a networked service model in which a user in Ogoja can receive the same quality of reference support as a user in Calabar, without having to travel. For this to happen, however, there must be investment in infrastructure such as reliable internet and power, training for library staff on how to manage and update chatbot systems, and collaboration among libraries to develop shared content that reflects the needs of Cross-River communities. There is also the need to localise chatbot content so that it communicates in English, Pidgin English, and, where possible Efik, Ejagham, and other local languages, because language is a critical factor in ensuring that Media and Information Literacy messages are understood and accepted. If these steps are taken, the library ecosystem in Cross-River State can serve as a model for how libraries in other parts of South Nigeria can use AI and chatbots to enhance user services, to promote critical thinking, and to reaffirm their relevance in the 21st century. The ecosystem already exists, the need is clear, and the technology is available; what remains is the commitment to transform libraries from quiet reading rooms into

SSJ PUBLICATIONS
Journal of Entrepreneurship and Global Economic Leadership
ISSN-3143-8822
Research Article

intelligent, responsive centers for learning and citizenship.

Information literacy instruction and training

The most sustainable strategy for combating misinformation in the digital age is to build the capacity of citizens to think critically about information, and libraries are uniquely positioned to lead this effort because information literacy has always been central to their professional mandate [11]. In the context of South Nigeria, where users increasingly depend on WhatsApp, Facebook, and TikTok for news, traditional classroom-based instruction is no longer sufficient, and there is a need for continuous, scalable, and interactive forms of training that meet users on the platforms they already use. Artificial Intelligence and chatbots provide this opportunity because they can deliver personalized, 24/7 instruction that guides users through the steps of evaluating sources, identifying bias, and verifying claims in real time [3].

Studies from academic libraries globally show that when information literacy is integrated with technology, students demonstrate improved ability to distinguish between credible and misleading content [2]. In Nigeria, scholars have argued that library instruction must move beyond database searching to include critical media analysis, especially given the high rate of misinformation during elections and public health crises [5]. Selected libraries in South Nigeria such as the University of Calabar and University of Port Harcourt have begun to embed information literacy in orientation, but these programs reach limited audiences. By deploying AI chatbots on library websites and WhatsApp, libraries in Cross-River, Rivers, and Delta States can deliver micro-learning modules, quizzes, and instant feedback to thousands of users simultaneously, thereby extending the reach of instruction beyond physical spaces [6].

This strategy addresses the root cause of misinformation, which is not just the availability of false content but the absence of skills to evaluate it, and it repositions libraries as essential educators in the 21st-century information ecosystem.

Fact-checking and verification services

Libraries have historically functioned as gatekeepers of reliable information, and in the current era of information disorder this role must be expanded to include active fact-checking and verification services that respond to the immediate needs of users [10]. The proliferation of false claims on social media in Nigeria, particularly around health and politics, has created a demand for trusted institutions that can provide rapid clarification, and libraries are well placed to fill this gap because of their reputation for neutrality and accuracy [8].

Fact-checking services involve librarians using tools such as reverse image search, source triangulation, and cross-referencing with authoritative databases to verify claims before responding to enquiries [12]. The integration of AI chatbots enhances this process because chatbots can be trained with verified knowledge bases from institutions such as NCDC, WHO, and INEC, and can provide instant responses to user queries while also explaining the basis for the verification [3]. At the University of Port Harcourt Library, an AI-enabled discovery layer has been used

SSJ PUBLICATIONS
Journal of Entrepreneurship and Global Economic Leadership
ISSN-3143-8822
Research Article

to help students identify credible academic sources, and a similar approach can be applied to social media content circulating in the wider community [6].

In Cross-River State, a WhatsApp-based verification service would be particularly effective given that WhatsApp is the dominant channel for misinformation spread [7]. For such services to succeed, libraries must establish clear workflows for updating content and monitoring emerging false narratives, and they must communicate transparently about their verification methods. By providing fact-checking services, libraries not only combat misinformation but also reinforce public trust in libraries as reliable sources of information.

Digital content curation and verified information portals

Information overload is one of the key drivers of vulnerability to misinformation, because when users are confronted with too much unverified content, they often default to sharing whatever appears most frequently or most sensational [1]. Digital content curation addresses this problem by having librarians systematically select, evaluate, and organise information on priority topics so that users can access credible resources without having to sift through noise. In South Nigeria, where mobile data costs are high and attention spans are short, curated portals that are mobile-optimised and regularly updated can serve as authoritative alternatives to social media feeds [2].

AI tools can support curation by scanning large volumes of online content, identifying trending misinformation, and recommending authoritative sources for librarian review [3]. A state-level verified portal hosted by the Cross-River State Library Board could, for example, provide sections on health, education, agriculture, and governance, with all content linked to official sources and presented in English and Pidgin English to ensure accessibility. The University of Calabar Library has made progress in curating e-resources for students, but this model needs to be expanded to serve the general public through web and social media channels [9].

When chatbots are integrated into these portals, users can ask follow-up questions and receive guidance to the most relevant materials, creating a seamless experience between static content and interactive support. Content curation therefore allows libraries to reduce exposure to misinformation while demonstrating their value as institutions that provide not just access, but direction.

Community engagement and partnerships

Addressing misinformation requires more than technological solutions; it requires building relationships with the communities that libraries serve, because trust is built through consistent presence and collaboration [13]. In South Nigeria, libraries must move beyond their walls and engage with schools, faith-based organisations, youth groups, and traditional leaders who already influence local information networks. Partnerships enable libraries to co-create information literacy programs that are culturally relevant and to disseminate verified information through channels that communities already trust [5]. AI and chatbots can amplify this engagement by being embedded in community WhatsApp groups, where they can provide weekly

SSJ PUBLICATIONS
Journal of Entrepreneurship and Global Economic Leadership
ISSN-3143-8822
Research Article

tips, answer questions, and collect reports of suspicious messages from members [6].

This creates a feedback loop that allows librarians to identify emerging misinformation trends and respond quickly. In Rivers State, for example, partnerships between university libraries and secondary schools have shown promise in raising students' awareness of online verification techniques. When libraries work with community influencers and local media, they extend their reach and ensure that anti-misinformation messages are not perceived as top-down directives but as community-owned initiatives. Community engagement and partnerships are therefore essential for scaling library impact and for ensuring that strategies to combat misinformation are grounded in local realities.

Advocacy and policy integration

For all library strategies to be sustainable, they must be backed by policy and advocacy that positions libraries as critical infrastructure for information integrity in the digital age [10]. Advocacy involves engaging government, university management, and the public to recognise that libraries are not peripheral institutions but essential actors in promoting media and information literacy and in countering misinformation [2]. In Nigeria, the National Policy on ICT in Education provides a framework that libraries can leverage to argue for funding and institutional support for digital literacy programs [14].

At the state level in South Nigeria, ministries of education, health, and information should be engaged to integrate library-led initiatives into development plans, and budgetary allocations should be made for infrastructure, staff training, and chatbot maintenance. Libraries must also develop internal policies on AI use, data privacy, and content accuracy to ensure that chatbot services are ethical and trustworthy [3].

Professional bodies such as the Nigerian Library Association have a role to play in setting standards and providing capacity building for librarians across the region. Without policy support, library initiatives risk remaining as isolated projects that collapse when external funding ends. With proper advocacy and integration, however, libraries in South Nigeria can secure the resources needed to scale AI and chatbot services, and can assert their leadership role in building a more informed and resilient public.

Promoting Digital Citizenship and Responsible Online Behaviour Through Libraries

Digital citizenship in the cross-river context

The concept of digital citizenship has gained renewed importance in Cross-River State because the rapid expansion of internet and mobile connectivity has placed citizens, especially young people, in digital spaces where they interact, learn, and make decisions daily without necessarily having the skills to navigate those spaces responsibly. Digital citizenship refers to the ability to engage with technology in ways that are safe, ethical, respectful, and informed, and it encompasses competencies such as protecting one's privacy, respecting the rights of others online, and contributing constructively to digital communities [15].

SSJ PUBLICATIONS
Journal of Entrepreneurship and Global Economic Leadership
ISSN-3143-8822
Research Article

In Cross-River State, where Calabar, Ikom, Ogoja, and Ugep have witnessed growing use of WhatsApp, Facebook, and TikTok for communication and information, the absence of structured digital citizenship education has left many users vulnerable to misinformation, cyberbullying, and unethical online behaviour. The Cross-River context is further shaped by the fact that most digital skills are acquired informally through peers and social media, rather than through schools or public institutions, which means that values such as respect, accountability, and critical thinking are often not emphasised in online interactions [7].

This has real consequences, because rumours and false information spread quickly in community WhatsApp groups, and users often forward content without considering its source or potential harm. Libraries in Cross-River State are therefore presented with an opportunity to intervene, because they are trusted institutions that can provide neutral, community-based education on how to be responsible digital citizens. By positioning digital citizenship as a core library service, institutions in the state can help to build a public that is not only connected, but also capable of engaging online with integrity and discernment [2].

Libraries as spaces for digital citizenship education

Libraries have historically been spaces for learning, reflection, and civic engagement, and in the 21st century this role naturally extends to the digital realm where citizens now spend a significant portion of their time [1]. As trusted and non-partisan institutions, libraries in South Nigeria are uniquely positioned to serve as centres for digital citizenship education because they are accessible to students, workers, and community members, and because they are perceived as neutral spaces that are not driven by commercial or political interests [10].

In Cross-River State, both academic libraries such as the University of Calabar Library and public libraries under the Cross-River State Library Board can serve as hubs where digital citizenship is taught through workshops, online modules, and interactive tools. The advantage of using libraries for this purpose is that they already have the mandate to promote information literacy, and digital citizenship can be framed as an extension of that mandate to include online rights, responsibilities, and ethics [11]. Moreover, libraries can leverage technology to scale this education, for example by using chatbots to deliver daily tips on responsible online behavior, to answer questions about online safety, and to model respectful communication [3].

Selected libraries in South Nigeria that have begun to use WhatsApp and websites for user engagement can expand these channels to include digital citizenship content, thereby reaching users who may never visit the physical library. By embracing this role, libraries reaffirm their relevance and demonstrate that they are not only about books, but about building capable and responsible citizens for the digital age.5.3 Teaching the Nine Elements of Digital Citizenship[~2 Pages]A widely accepted framework for digital citizenship education is the *"Nine Elements of Digital Citizenship"* developed by Ribble and Miller [15], which provides a comprehensive guide for teaching individuals how to behave responsibly in digital environments. These

SSJ PUBLICATIONS
Journal of Entrepreneurship and Global Economic Leadership
ISSN-3143-8822

nine elements include digital access, digital commerce, digital communication, digital literacy, digital etiquette, digital law, digital rights and responsibilities, digital health and wellness, and digital security. Teaching these elements in the Cross-River context requires adapting them to local realities, such as the prevalence of WhatsApp groups, the spread of health misinformation, and the challenges of data privacy on mobile devices [7].

Libraries can teach digital access by ensuring that users have affordable entry to the internet and e-resources, and they can teach digital commerce and law by warning users about online scams and the importance of respecting copyright. Digital communication and etiquette can be promoted through library-led campaigns on respectful posting and the dangers of hate speech, while digital literacy can be reinforced through training on how to evaluate sources and spot misinformation [2]. Digital health and wellness can address issues such as screen time and online addiction, and digital security can focus on password protection and avoiding phishing. AI chatbots are particularly useful for teaching these elements because they can deliver bite-sized lessons, quizzes, and reminders to users regularly, and they can tailor content to the language and context of users in South Nigeria [6]. For example, a chatbot in the University of Port Harcourt Library could send weekly messages on "*digital etiquette*" in English and Pidgin, with examples drawn from local social media trends. By systematically teaching the nine elements, libraries can help to cultivate a generation of digital citizens who are knowledgeable, ethical, and resilient.

Research Article

Artificial intelligence and chatbots in enhancing user services: Evidence from selected libraries in south, Nigeria

The integration of Artificial Intelligence and chatbots into library services represents one of the most promising strategies for promoting digital citizenship and enhancing user services in South Nigeria, because these technologies allow libraries to provide immediate, personalised, and scalable support that aligns with how users currently seek information [3]. Evidence from selected libraries in the region shows that AI tools are already being used, albeit in pilot forms, to address the gap between user expectations and institutional capacity. At the University of Calabar Library, a basic chatbot has been deployed on the library website and WhatsApp line to respond to frequently asked questions about registration, library hours, and access to e-resources, and feedback from students indicates that the instant response feature has improved satisfaction and reduced pressure on reference staff [9].

Similarly, the Cross-River University of Technology Library has experimented with automated systems that guide users on how to access the institutional repository and academic databases, which is important in an environment where many students struggle to navigate scholarly content independently [5]. In Rivers State, the University of Port Harcourt Library has gone a step further by implementing an AI-enabled discovery tool that analyses search behaviour and recommends credible academic sources, while also filtering out predatory journals, thereby helping students to develop better research habits [6]. These examples demonstrate that even with infrastructural challenges such as irregular

SSJ PUBLICATIONS
Journal of Entrepreneurship and Global Economic Leadership
ISSN-3143-8822
Research Article

power and limited bandwidth, libraries in South Nigeria are finding ways to use AI to extend service hours, reduce response time, and promote responsible information use.

Beyond operational efficiency, chatbots are also being used to promote digital citizenship by providing tips on online safety, by directing users to verified health and civic information, and by modelling critical evaluation in every interaction [2]. The evidence therefore suggests that AI and chatbots are not just tools for efficiency, but are strategic instruments for repositioning libraries as intelligent, responsive, and educational institutions in the 21st century. To maximise this potential, libraries in South Nigeria must invest in staff training, content localisation, and partnerships that ensure these technologies are sustainable and culturally relevant.

Significance/contributions of the study

This study is significant to policymakers, library professionals, educators, and citizens in Cross-River State and Nigeria at large. To Policy Makers: The findings will provide evidence to the Cross-River State Government and the Ministry of Education on the need to integrate libraries into the state's digital literacy and civic education strategy. It will highlight the importance of funding library infrastructure and recognising libraries as key institutions in combating misinformation.

To Library Professionals: The study offers a framework for repositioning library services for the 21st century. It provides practical strategies such as information literacy instruction, fact-checking services, content curation, and the use of AI and chatbots that librarians can adopt to remain relevant and impactful.

To Educators and Students: Emphasising media and information literacy, the study contributes to curriculum development in schools and universities. It underscores the need to teach students not just how to use technology, but how to use it responsibly and critically.

To Citizens and Communities: Ultimately, the study benefits the general public by advocating for institutions that can equip them with skills to navigate the digital space safely. A citizenry that can identify misinformation and engage responsibly online is better positioned to make informed decisions about health, governance, and community life.

Summary

This study examined the role of Artificial Intelligence and chatbots in enhancing user services in 21st-century libraries, with specific evidence drawn from selected academic and public libraries in South Nigeria. The background established that the information environment has been fundamentally transformed by digital technologies and social media, and that this transformation has created both opportunities for increased access and significant challenges related to misinformation, information overload, and the erosion of trust in institutions. Within this context, libraries in South Nigeria, including institutions in Cross-River, Rivers, Delta, Edo, Bayelsa, and Akwa Ibom States, are under pressure to move beyond traditional service models and to provide services that are immediate, personalised, and accessible on the digital platforms where users already spend their time.

SSJ PUBLICATIONS
Journal of Entrepreneurship and Global Economic Leadership
ISSN-3143-8822
Research Article

The literature reviewed in Chapters 2 to 5 revealed that information disorder is driven by a combination of algorithmic design, low media and information literacy, and the ease of content production, and that this problem is particularly pronounced in Nigeria where social media serves as the primary source of news for many citizens. The review further established that libraries, as trusted institutions, have a renewed mandate to promote Media and Information Literacy and digital citizenship, and that strategies such as information literacy instruction, fact-checking services, digital content curation, community engagement, and policy advocacy are essential for combating misinformation. Evidence from selected libraries in South Nigeria showed that institutions such as the University of Calabar Library, the Cross-River University of Technology Library, and the University of Port Harcourt Library have begun to experiment with AI chatbots and automated systems to handle enquiries, guide users to resources, and provide orientation, and that users have responded positively to the availability of instant and round-the-clock support. The study also found that while there is willingness to embrace technology, challenges such as poor infrastructure, limited staff capacity, lack of localised content, and inadequate funding continue to limit the scale and effectiveness of AI and chatbot deployment.

Conclusion

Based on the review and evidence from selected libraries in this study, it can be concluded that Artificial Intelligence and chatbots have significant potential to transform user services in 21st-century libraries in South Nigeria by making services more accessible, responsive, and educational. The use of even basic chatbots in some academic libraries in the region has shown that users' value instant responses, 24/7 access, and guidance to credible resources, which extends library relevance beyond physical opening hours. When these technologies are combined with deliberate efforts to build users' critical thinking skills, they can also contribute to developing a more informed and responsible digital public that is better equipped to navigate information disorder.

However, the full benefits of AI and chatbots are yet to be realised in South Nigerian libraries because implementation remains fragmented, underfunded, and poorly aligned with institutional strategic planning. Libraries in the region cannot afford to remain passive given the dominance of Google and social media as primary sources of information and the rising challenge of misinformation. If libraries fail to provide intelligent, trusted, and user-friendly digital alternatives, they risk becoming irrelevant to the current generation of users. Therefore, the integration of AI and chatbots must be viewed not merely as a technical upgrade, but as a fundamental repositioning of the library as an intelligent, learning, and civic institution in the digital age.

Recommendations for Strengthening Library Services

To strengthen library services through AI and chatbots in South Nigeria, several strategic actions are recommended.

First, government at federal and state levels, in collaboration with university management and library

SSJ PUBLICATIONS
Journal of Entrepreneurship and Global Economic Leadership
ISSN-3143-8822
Research Article

boards, should provide sustained funding for stable internet connectivity, reliable power supply, and the procurement of appropriate AI and chatbot platforms, because without sound infrastructure, digital services cannot thrive.

Second, libraries must institutionalise regular training programs for librarians and ICT staff on chatbot management, data analytics, and digital content curation to ensure that personnel have the requisite competencies to design, maintain, and improve intelligent systems.

Third, chatbots and digital portals should be developed with localised content that reflects the linguistic and cultural realities of South Nigeria, including English, Pidgin English, and major local languages, and the knowledge base should be continuously updated with verified information from credible institutions to ensure accuracy and build user trust.

Fourth, libraries should embed Media and Information Literacy and digital citizenship into all chatbot interactions and library programs so that every user engagement becomes an opportunity to teach critical evaluation, online safety, and responsible digital behaviour.

Fifth, libraries should build strategic partnerships with schools, civil society organisations, media houses, and community leaders to raise awareness of chatbot services and disseminate verified information through trusted networks, thereby extending anti-misinformation efforts beyond library walls.

Finally, professional bodies such as the Nigerian Library Association should engage policymakers to ensure that AI and digital literacy are mainstreamed into state and national development agendas. At the same time, individual libraries should develop clear internal policies on data privacy, accuracy, and ethical use of AI and establish mechanisms for monitoring usage, gathering user feedback, and tracking emerging information trends to enable continuous improvement.

References

1. Lankes, R. David. *The atlas of new librarianship*. The MIT Press, 2011.
2. Tella, A. Artificial intelligence in libraries. In A. Tella (Ed.), Handbook of research on digital transformation and challenges to data security and privacy (pp. 89–110). IGI Global. (2020).
3. Cox, A. M. "How artificial intelligence is changing academic libraries: Advancing the library as a strategic asset." *Library Management*, *42*(2021):492–500.
4. National Bureau of Statistics. "Telecoms data: Active internet users." NBS Nigeria. (2023).
5. Omeluzor, S. U, Bamidele I, Dika F. "The role of academic libraries in combating misinformation in Nigeria." *Journal of Information Science Theory and Practice*, 5(2017):12–25.
6. Ani, O. E, Ahiauzu, B. "Assessment of artificial intelligence tools in academic libraries in South-South Nigeria." *International Journal of Library and Information Science*, *13*(2021):45–56.
7. Adebayo, O, Nwalo, K. I. N. "Library services and information dissemination during COVID-19 in Nigerian academic libraries." Library Philosophy and Practice, (2022):1-15.

SSJ PUBLICATIONS
Journal of Entrepreneurship and Global Economic Leadership
ISSN-3143-8822
Research Article

8. Centre for Democracy and Development [CDD]. "Disinformation and fake news in Nigeria: 2022 election report." CDD West Africa. (2022).
9. Cross-River University of Technology Library [CRUTECH]. "Annual library report: Digital services and user engagement." CRUTECH Press. (2021).
10. Federation of Library Associations and Institutions [IFLA]. "IFLA statement on libraries and fake news." IFLA. (2018).
11. Eisenberg, Michael B. "Information literacy: Essential skills for the information age." *DESIDOC journal of library & information technology* 28, no. 2 (2008): 39-47.
12. Wardle, Claire, and Hossein Derakhshan. *Information disorder: Toward an interdisciplinary framework for research and policymaking*. Vol. 27. Strasbourg: Council of Europe, 2017.
13. Jaeger, Paul T., Natalie Greene Taylor, and Nancy Kranich. *Foundations of information policy*. Chicago, IL: ALA Neal-Schuman, 2019.
14. Federal Ministry of Education. National policy on ICT in education. FME Nigeria. International. (2019).
15. Ribble, Mike, and Teresa Northern Miller. "Educational leadership in an online world: Connecting students to technology responsibly, safely, and ethically." *Journal of asynchronous learning networks* 17, no. 1 (2013): 137-145.