

# Analyzing the adoption of Artificial Intelligence in modern library services: a Technology Acceptance Model perspective

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**Abstract:** The primary purpose of this research is to analyze the adoption of artificial intelligence in modern library services through the lens of the Technology Acceptance Model. The incorporation of Artificial Intelligence technologies into library operations has the prospect to revolutionize the pattern information is managed, retrieved, and conveyed to users. This methodology outlines a structured approach to qualitatively analyze existing literature on the adoption of Artificial Intelligence in modern library services through the Technology Acceptance Model perspective. By synthesizing findings from various studies, this research aims to provide valuable insights into the factors influencing Artificial Intelligence adoption and the application of Technology Acceptance Model in this context. This study investigates the adoption and acceptance of Artificial Intelligence-driven solutions in a contemporary library setting, utilizing the Technology Acceptance Model as a theoretical framework. The research explore the insights and attitudes of librarians, staff, and patrons in relation to Artificial Intelligence-support systems in libraries, with a special focus on perceived usefulness, perceived ease of use, behavioral intentions, and actual usage. The study also ruminate on regulating factors and external variables that may stimulate Artificial Intelligence adoption in the library environments. Through a broad analysis of Technology Acceptance Model factors in the context of Artificial Intelligence and library services, this research provides valuable insights for libraries looking to implement and enhance Artificial Intelligence technologies to better serve their communities. This study provides libraries with actionable insights and practical guidance for effectively integrating Artificial Intelligence technologies into their services, ultimately leading to enhanced efficiency, effectiveness, and user satisfaction. The originality of this research lies in its innovative application of the Technology Acceptance Model to the adoption of Artificial Intelligence in modern library services. By addressing a contemporary issue with a robust theoretical framework and providing empirical data, this study contributes valuable insights to both the academic community and

practical field of library science. It stands out by exploring uncharted territories, addressing unique variables pertinent to Artificial Intelligence, and providing a holistic view of technology adoption in libraries.

**Keywords:** artificial intelligence; modern library services; technology acceptance model; digital libraries; human-AI interaction

## 1 Introduction

Nowadays, we find ourselves on the brink of the Fourth Industrial Revolution, a period marked by the merger of digital skills, artificial intelligence, biotechnology, and the internet of things (IoT). This revolution has the potential to disrupt nearly every industry and aspect of human life. In view of the threshold of the Fourth Industrial Revolution, we are once again on the brink of a transformative era that has the potential to reshape human society and the way we live our lives (Islam; Islam; Hossain, 2023). Like the revolutions that preceded it, this new era of innovation will bring about challenges and opportunities, demanding careful consideration of ethical, societal, and economic implications. The Fourth Industrial Revolution (4IR) holds the promise of unlocking new levels of productivity, sustainability, and human well-being, but its ultimate success will depend on our ability to harness its power for the benefit of all. The 4IR, led by artificial intelligence and an array of transformative technologies, is indeed ushering in a new era of human existence (Xu; David; Kim, 2018). While it brings unprecedented opportunities for progress and prosperity, it also presents challenges, particularly in the realm of employment. By embracing innovation, reskilling the workforce, and crafting thoughtful policies, we can navigate this revolution with the aim of creating a future that is not merely cutting-edge technologic but also inclusive and equitable for all members of society (Morrar; Arman; Mousa, 2017).

In the ever-evolving landscape of higher education, libraries are experiencing a digital transformation (DT) to enhance the way they serve the information needs of students and researchers. Artificial Intelligence (AI) stands out as a cutting-edge technological trend that holds immense potential for revolutionizing library services (Okunlaya; Syed Abdullah; Alias, 2022). By

harnessing AI, university libraries can provide alternative educational services that facilitate intelligent decision-making, information retrieval, and knowledge sharing. This article focus on the unexploited prospect of Artificial Intelligent in university libraries and introduces the AI Library Services Innovative Conceptual Framework (AI-LSICF) to inspire a new era of innovative service delivery (Komosany; Alnwaimi, 2021).

Artificial Intelligence (AI) holds immense potential to revolutionize library services, making them more efficient, personalized, and responsive to user needs. However, for AI to truly benefit library clients and users, it is essential that they not only embrace this technology but also use it effectively. Low acceptance of AI can have adverse consequences, including underutilization of AI resources, an excess of idle AI devices, and a potential decline in technological innovation within libraries. This article explores the importance of user acceptance in the successful integration of AI in libraries and offers strategies to promote its adoption (Kelly; Kaye; Oviedo-Trespalcacios, 2023). User acceptance is a linchpin in the successful integration of AI in libraries. Libraries that prioritize user engagement, education, and transparency can overcome potential barriers to acceptance and ensure that AI technologies are embraced and effectively used. By promoting user acceptance, libraries can maximize the potential of AI, optimize resource allocation, and foster a culture of technological innovation that benefits both library clients and the institution as a whole (Chai *et al.*, 2021).

From a service innovation viewpoint, the positioning of chatbots and virtual assistants redefines traditional librarian roles and responsibilities. Librarians are also evolving from being the custodians of information to intermediaries in AI sector and as well as data curators, responsible for training and maintaining of intelligent systems that usually align with ethical and user-centred information applications (Pierre-Robertson, 2023). Accordingly, continuous professional development in AI literacy has become essential for sustaining the application and credibility of library professionals in a quickly digitalizing information ecosystem.

## 2 The Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) is a renowned as a theoretical framework that is commonly used in the academic field of information systems and technology management to understand and envisage how individuals identify and accept innovative technology. It was developed by Fred Davis in the 1980s and ever since has experienced several revisions and extensions. TAM is often used in research and practical applications to assess users' adoption and use of technology, especially software applications and information systems (Silva, 2015).

The core components of the Technology Acceptance Model are: the pivotal point of TAM is based on two factors that is, perceived ease of use and perceived usefulness, which influences user's attitude concerning technology, which affects their intention to use the technology. User intention, in this model, is a fundamental determinant of actual technology usage (Suki; Suki, 2011).

## 3 User perception of AI in libraries

Perceived Ease of Use (PEOU) is a factor that refers to the user's perception of how easy it is to learn and use a technology. Users are probable going to accept and use technology if they believe it is user-friendly and not too complex (Amin; Rezaei; Abolghasemi, 2014). Understanding user perception of AI in libraries is crucial for successfully implementing AI technologies in library services. User perceptions can significantly influence their acceptance, utilization, and satisfaction with AI-powered library tools (Hussain, 2023). Explore how intuitive and easy-to-use AI interfaces are, as complex or confusing AI systems may deter users. User-friendliness is indeed essential when it comes to AI interfaces. Complex or confusing AI systems can deter users, and creating intuitive and easy-to-use interfaces is crucial for ensuring that AI technology is accessible and effective.

The goal is to make interactions with AI systems as natural and intuitive as possible, reducing barriers to entry and ensuring that users can harness the power of AI technology without feeling overwhelmed or confused. This involves

a combination of thoughtful design, user-centered principles, and ongoing refinement based on user feedback (Schwitzgebel, 2023).

#### 4 Perceived usefulness

Perceived usefulness relates to how user's perceive a specific technology and how it will enrich their job performance or make tasks easier. If users perceive a technology as useful, the possibility of adoption and acceptance is high (Larcker; Lessig, 1980). Users are likely to embrace Artificial Intelligence in libraries if they perceive it as beneficial and valuable. Research can investigate how AI enhances their library experience, such as improving search results, recommendations, or resource accessibility.

However, it is vital for libraries to be clear about how AI is used and channel towards addressing various concerns about privacy and data security. Users are more likely to embrace AI if they trust that their data is handled responsibly and that AI systems are designed to benefit them, rather than exploit their information. Additionally, offering training and support to users who may not be familiar with AI technology can go a long way in ensuring its successful adoption (Sadriwala; Sadriwala, 2022). Artificial Intelligence has the potential to considerably enhance the library experience by improving search, recommendations, accessibility, and operational efficiency. Embracing AI in libraries should be accompanied by clear communication, transparency, and user education to build trust and ensure its successful integration (Barsha; Munshi, 2024).

#### 5 Problem statement

The integration of Artificial Intelligence (AI) technologies into modern library operation and services have the tendencies to revolutionize how libraries operate and how patrons access and utilize information. However, despite the evident advantages and opportunities presented by AI, its widespread adoption within library systems faces several challenges (Subaveerapandiyan, 2023). This article aims to identify and address key issues related to the implementation and application of AI in modern library operations from a Technology Acceptance

Model (TAM) perspective. Many library stakeholders, including librarians, administrators, and patrons, may lack a comprehensive understanding of Artificial Intelligence (AI) technologies and their potential benefits in the library context. This limited awareness can hinder the successful adoption of AI-driven services (Al-Adwan *et al.*, 2023).

In the opinion of Mohr and Kühl (2021), it was stated that the perceived complexity of AI systems and applications can be a barrier to their acceptance. Users, including library staff and patrons, may be apprehensive about using AI-driven tools if they find them difficult to understand or operate. Furthermore, Mohr and Kühl (2021), observed that the implementation of AI in libraries often involves the collection and processing of user data, which can raise privacy concerns. Patrons may be hesitant to embrace AI services if they are not confident in the security and responsible handling their personal information.

Libraries, like many institutions, can be resistant to change. Traditional practices and workflows may be deeply ingrained, making it challenging to introduce AI-driven technologies that require organizational adjustments and new skill sets. Implementing AI in library services requires significant financial and human resources. Smaller libraries or those with limited budgets may find it difficult to invest in AI infrastructure and expertise (Rafi *et al.*, 2022).

The success of AI applications in libraries depends on user acceptance and engagement. If patrons and library staff do not perceive AI-driven services as valuable or user-friendly, they may resist their adoption. AI solutions often come as one-size-fits-all products. Libraries may struggle to tailor AI applications to their unique needs, leading to suboptimal outcomes and user experiences (Kumar *et al.*, 2019).

The introduction and use of AI in libraries raises ethical questions, like algorithmic bias, transparency, and fairness. Libraries must grapple with these ethical dilemmas when implementing AI technologies. Addressing these challenges requires a comprehensive understanding of the factors prompting the acceptance and effective integration of AI in modern library services. A Technology Acceptance Model (TAM) perspective can provide understandings into users' perceptions and attitudes towards the application of AI, helping

libraries design strategies to overcome these challenges and leverage AI's potential to enhance library services (Bogina *et al.*, 2022).

## 6 Contextualization

The adoption of Artificial Intelligence (AI) has been a transformative power in several sectors, including libraries and information services. As libraries continue to evolve in the digital age, AI technologies presents a possibility for efficiency, accessibility, and user experiences (Okunlaya; Syed Abdullah; Alias, 2022). The study titled *Analyzing the Adoption of Artificial Intelligence in Modern Library Services: A Technology Acceptance Model Perspective* set out to investigate the factors influencing the acceptance and integration of AI technologies within library settings.

Libraries have traditionally been repositories of knowledge, but the digital revolution has redefined their roles. In the contemporary landscape, libraries must adapt to changing user expectations and technological advancements to remain relevant. AI, which includes machine learning, natural language processing, and data analytics, offers opportunities to streamline operations, personalize services, and optimize resource allocation in libraries (Grazia Melchionda, 2007).

The study about the adoption of Artificial Intelligence in contemporary library operation within the framework of the Technology Acceptance Model (TAM) represents an important endeavor in the context of libraries' digital transformation. As libraries continue to adapt to changing technological landscapes, appreciating the factors that drive the successful adoption of AI is crucial for providing innovative, efficient, and user-centric services in the modern era (Bozkurt, 2023).

## 7 Significance of the study

A study on AI in modern libraries using the Technology Acceptance Model (TAM) holds an importance in the field of library science and technology. Research in AI in modern libraries using the Technology Acceptance Model is significant because it provides insights into user perceptions, guides technology adoption, ensures cost-effectiveness, addresses ethical concerns, and ultimately



helps libraries evolve and stay relevant in a rapidly changing technological landscape.

The integration of AI technologies in libraries has the potential to significantly enhance library services. By using TAM, researchers can assess how library patrons and staff perceive and accept these AI-driven services. This understanding is crucial for libraries aiming to provide better and more efficient services.

TAM focuses on users' attitudes and perceptions towards technology. By applying TAM to AI in libraries, researchers can gain insights into how AI applications are perceived by library users. This information can be used to tailor AI-driven services to meet the specific needs and expectations of library patrons.

Implementing AI technologies in libraries can be a significant financial investment. A TAM study can help library administrators assess whether the investment is justified by examining user acceptance. If users are satisfied and find value in AI-driven services, it can justify the cost.

TAM can provide guidance on strategies for introducing AI in libraries. Understanding the factors that influence acceptance, such as perceived ease of use and perceived usefulness, can inform decision-makers on how to introduce and promote AI technologies effectively.

Libraries may need to provide training and support for users and staff to effectively use AI tools. TAM can help identify areas where training is needed, and library administrators can allocate resources accordingly. AI in libraries often involves handling sensitive user data. TAM can assess user concerns related to data privacy and ethics, helping libraries develop policies and practices that ensure the responsible use of AI technologies.

A study applying TAM to AI in libraries contributes to the body of knowledge in library science and technology. It can serve as a reference point for future research and help build a theoretical framework for understanding AI adoption in library settings.

Libraries face competition not only from other libraries but also from online information sources. Embracing AI can provide libraries with a competitive edge by offering advanced and efficient services that attract and



retain users. Libraries are often central community hubs. Understanding how AI is accepted within the community can foster better engagement and support for library initiatives, including AI integration.

Libraries need to plan for the long term. A TAM study can help libraries make informed decisions about the continued use and development of AI technologies, ensuring their sustainability and relevance in the digital age.

## 8 Purpose of the research

The primary purpose of this research is to analyze the adoption of artificial intelligence (AI) in modern library services through the lens of the Technology Acceptance Model (TAM).

## 9 Research objectives

The research objectives are:

- a) to assess the perceived usefulness of AI-driven library services among librarians, staff, and patrons;
- b) to evaluate the perceived ease of use of AI technologies in library settings;
- c) to analyze the actual usage and acceptance of AI-powered library services;
- d) to identify strategies and recommendations for libraries to effectively implement and promote AI technologies based on TAM findings.

## 10 Methodology

This research utilizes a qualitative approach, specifically employing content analysis of existing literature to investigate the adoption of Artificial Intelligence (AI) in modern library services through the Technology Acceptance Model (TAM). The goal is to synthesize findings from prior research to understand the factors that influence AI adoption in library settings. A comprehensive literature search was performed using various academic databases, including but not limited to: Google Scholar, JSTOR, Library and Information Science Abstracts (LISA), ProQuest. The Inclusion Criteria include: Peer-reviewed journal articles, conference papers, theses, and dissertations, Publications from the past ten years (2013-2023) to ensure relevance in Studies focusing on the application of AI in

library services, for this study, a total of forty-four recently published articles were systematically reviewed and synthesised within a qualitative research framework to lay the foundation for this study. Research that employs or discusses the Technology Acceptance Model (TAM), and the Exclusion Criteria involves Non-English publications, Articles that do not focus on AI or library services and Literature that does not mention or apply TAM. The following keywords and phrases were used to guide the literature search: Artificial Intelligence in libraries, AI adoption in library services, Technology Acceptance Model in libraries, AI and library services and TAM and AI adoption. Content analysis was employed to systematically review and analyze the selected literature. The validity and reliability include cross-verifying information from multiple sources and perspectives within the literature. The primary limitation of this study is its reliance on existing literature, which may introduce bias based on the scope and focus of available research. Also, the exclusion of non-English publications may limit the generalizability of the findings to non-English-speaking contexts. As this study involves the analysis of publicly available literature, there are no significant ethical concerns. However, proper citation and acknowledgment of all sources were ensured to maintain academic integrity. In this article AI tool was used in language editing only.

This research work is based on comprehensive review of literature, hence, remains basically descriptive because it is based on the review of existing studies (secondary sources), and it aims to synthesize rather than to test data; which operates within a theoretical, not empirical, framework; and the contribution is established through conceptual integration, not empirical validation.

## **11 Discussions of the study**

The discussion focuses on the research questions high-lighted above.

### **11.1 How to assess the perceived usefulness of AI-driven library services among librarians, staff, and patrons?**

In today's fast-paced digital age, libraries are increasingly turning to artificial intelligence (AI) to enrich their services and remain pertinent in the digital era.

AI-driven library services have the potential to streamline operations, improve user experiences, and provide personalized recommendations. However, the success of these services hinges on their perceived usefulness by librarians, staff, and patrons. This article explores the importance of assessing the perceived usefulness of AI-driven library services and highlights the perspectives of the key stakeholders involved (Enholm *et al.*, 2022).

Artificial intelligence encompasses a range of technologies such as machine learning, natural language processing, and data analytics. In libraries, AI is being employed in various capacities, including cataloging, content recommendation, chatbots for customer service, and data analytics for collection management (Ongsulee, 2017).

Librarians play a central role in implementing and managing AI-driven library services. Their perspective is crucial in evaluating the usefulness of these technologies. Some key considerations include:

**Efficiency and Time-Saving:** Librarians may assess whether AI tools help automate repetitive tasks, allowing them to allocate more time to high-value activities like research assistance and user engagement (Affum; Dwomoh, 2023).

Accuracy in cataloging and search results is essential. Librarians will evaluate whether AI-driven systems improve data accuracy and search precision (El Rayess, 2015). AI chatbots or virtual assistants should be assessed for their ability to provide effective user support and reduce the workload on librarians (Adetayo, 2023a).

Beyond librarians, library staff members are also impacted by AI-driven services. Their perceptions can influence the overall acceptance of these technologies. Staff members' comfort with AI tools depends on the quality of training and support provided during implementation (Chen, 2023). Staff members can offer insights based on user feedback and interactions, helping to refine AI systems and make them more user-friendly (Al-as'di; Miller, 2023).

Assessing whether AI fosters collaboration among staff members or creates barriers to effective teamwork is crucial (Mikalef; Gupta, 2021). Ultimately, the success of AI-driven library services hinges on their reception by library patrons (Slater, 2010). Patrons may appreciate AI systems that offer

personalized book recommendations or tailored search results (Fernandez, 2016). The user-friendliness of AI interfaces and their ability to simplify access to library resources are key indicators of usefulness (Kato; Kisangiri; Kaijage, 2021). Patrons may have concerns about data privacy and should feel assured that AI systems respect their privacy (Singamaneni *et al.*, 2022).

Assessing the perceived usefulness of AI-driven library services among librarians, staff, and patrons is a multifaceted process that involves evaluating efficiency, accuracy, user-friendliness, and the ability to meet the unique needs of each stakeholder group (Adetayo, 2023b). Regular feedback loops, ongoing training, and user-centric design are essential components of this assessment process (Hienerth; Keinz; Lettl, 2011). As libraries continue to evolve in the digital age, the insights gained from these assessments will be invaluable in ensuring that AI-driven services align with the needs and expectations of all stakeholders, ultimately contributing to the continued vitality of libraries in the 21st century (Gupta *et al.*, 2020).

### **11.2 How to evaluate the perceived ease of use of Artificial Intelligence technologies in library settings?**

Evaluating the perceived ease of use of AI technologies in library settings is crucial for ensuring that these technologies are effectively adopted and integrated into library services (Abdul Rahman; Mohezar, 2020). Perceived ease of use refers to how easily individuals believe they can use a particular technology. Perceived ease of use is also “[...] the degree to which a person believes that using a technology will be free from effort” (Tsai *et al.*, 2020). A person’s assessment of the amount of mental and physical work necessary to operate a particular piece of technology is known as perceived ease of use. There is a correlation between perceived utility and simplicity of use, according to several research (Wang, C. *et al.*, 2023). Wang, C. *et al.* (2023) also found that perceived utility and ease of use are positively correlated, according to earlier research. When something is simple to use on a daily basis, people tend to believe it to be useful. In the context of libraries and AI technologies, it can influence user adoption, user satisfaction, and the overall success of AI implementations (Usman *et al.*, 2020).

With the help of AI technologies, libraries can now take advantage of new opportunities that open up new paradigms. These opportunities include expanding their library's patron base, automating routine housekeeping tasks to reduce the need for physical and mental labor, and enabling borderless access to information resources and services. The rationale behind incorporating the evaluation of perceived ease of use as a construct in the adoption of AI technologies in the library, is based on the idea that user-friendliness increases a system's likelihood of acceptance by users. Stated differently, Izuagbe and Popoola (2017) found that a system's likelihood of acceptability, adoption, use, and support decreases with increasing complexity. In essence, the acceptance of AI technologies by librarians as well as the library patrons, is a function of how the technology is perceived as easy to use.

Even though technology is used widely in the twenty-first century (most recently AI technologies), determining whether or not to accept it in an organization depends on a number of factors, especially in developing nations where the cost of information technology infrastructure is growing and exposure to technology is low. In order to investigate librarians' intention for actual library technology adoption, Izuagbe *et al.* (2019) evaluated a model that combined perceived ease of use (PEOU) and e-Skills. The study's data came from four university libraries' professional librarians and library officers. They found that the model's best predictor of librarians' intention to accept technology is e-Skill, and in cases when e-Skills are inadequate, perceived ease of use will considerably limit librarians' intentions toward the uptake of library technology. These results contribute to an expanded and improved knowledge of the behavioral intention factors found in the Technology Acceptance Model (TAM).

The user-friendliness of AI interfaces and their ability to simplify access to library resources would entice both librarian, other library staff members and their patrons to adopt AI technologies in the library. Once they perceived that the technology is easy to use.

### **11.3 How to analyze the usage and acceptance of AI-powered library services?**

In an age marked by rapid technological advancements, the role of libraries in society has evolved significantly. Traditionally, libraries were places for quiet study and repositories of knowledge in the form of books and periodicals. However, with the advent of artificial intelligence (AI), libraries are undergoing a transformation, offering innovative AI-powered services to cater to the changing needs of their patrons. This article delves into the analysis of the usage and acceptance of AI-powered library services, shedding light on their impact on both libraries and library users (Wang, T. *et al.*, 2023).

AI-powered library services have become integral to modern libraries, offering efficiency, improved user experiences, and enhanced accessibility. Their acceptance continues to grow, but it's essential to address concerns related to privacy, bias, and job displacement (Panda; Chakravarty, 2022). As libraries navigate this new frontier, a balance between human expertise and AI automation is key to providing the best services to library users while preserving the essence of libraries as centers of knowledge and learning. Ultimately, AI's potential in libraries is vast, promising to shape the future of information access and discovery (Lins *et al.*, 2021).

For a technology to be successfully adopted, user acceptance of that technology is essential. Since AI has a lot to offer, consumers of AI technologies need to be open to accepting and making appropriate use of this technology (Kelly; Kaye; Oviedo-Trespalacios, 2023). As AI-powered library and information services is becoming popular on a daily basis, low acceptability such AI-powered services could lead to a fall in the consumption of AI by both library staff members and their patrons.

As a fallout of the covid-19 pandemic, a growing number of libraries had integrated AI-powered services and other state-of-the-art technology into their holding to improve patrons' library use experience, satisfaction and loyalty. It is worthy of note although that the acceptance or otherwise of these AI-powered products and services, is a function and relative to perceive ease of use and usefulness of the products and services. Individual differences and system

features are the two primary categories of external variables that have been found by prior research on TAM to determine acceptance of technology or otherwise. According to Zmud's (1979<sup>1</sup> *apud* Hong *et al.*, 2002.) and Nelson's (1990<sup>2</sup> *apud* Hong *et al.*, 2002) theoretical frameworks, individual differences were thought to be the most significant factor influencing the adoption of new technologies

Another concern about AI-powered technologies and systems acceptance and usage boils down user privacy and data protection. For instance, Shaheen and Khurshid (2023) conducted a study to determine acceptance of AI-powered system in a Pakistan library, the study's findings show that participants' attitudes and ideas about AI-powered library systems are not entirely consistent. While some people are quite open to the idea and think these services might help them find new sources and improve search accuracy, others voice concerns about possible privacy risks or inaccurate search results. The study also indicated that most participants said they would use AI-powered recommendation systems to find new content, a sizable portion said they have never used or are not inclined to use AI-powered technology. In order to encourage the usage of AI services and allay any fears or misconceptions users may have, libraries may need to provide additional outreach and education programs. Essentially from the study (Shaheen; Khurshid, 2023), it could be concluded that majority of the patrons give priority to user privacy and data protection when it comes to libraries. This highlights the necessity for libraries to handle any concerns about data privacy when deploying AI-powered technologies and services in a transparent and proactive manner.

#### **11.4 How to identify strategies and recommendations for libraries to effectively implement and promote AI technologies based on TAM findings**

Artificial intelligence should be of interest to libraries because it has the potential to organize and make large volumes of information easily accessible. The cutting-edge technology that powers the digital library of now-a-days is also artificial intelligence. The ultimate goal of artificial intelligence is to create computer systems or machines that are capable of thinking, acting, and even surpassing human intellect and cognitive ability. This has clear ramifications for the field of



librarianship. Artificial intelligence is a technology inspired by biology that mimics how people see and process data.

Artificial intelligence (AI) technologies are used by smart library automation expert to offer knowledge-based facilities to both library staff and patrons. It is imperative to differentiate artificial intelligence in libraries from library automation. This is so because the former goes beyond simply automating library operations, creating intelligent and logical systems that is capable of behaving and acting like librarians with little human intervention. The latter suggests the degree of mechanization of ordinary library operations. Although Li *et al.* (2015) felt that this development will never replace librarians, it emphasizes time-consuming and menial library tasks like shelf reading and free up the librarians to interact with patrons. Artificial intelligent systems have the ability to replicate human beings and thus replace them in the library.

## 12 Conclusion

The review shows that the Technology Acceptance Model (TAM) is still the most commonly used framework for predicting whether people will accept and use AI, including in libraries. Studies repeatedly find that when users believe an AI system is useful and easy to use, they are more likely to adopt it. Kelly, Kaye and Oviedo-Trespalcacios (2023) also note that TAM continues to perform better than many other models in predicting users' intentions. However, depending too heavily on TAM exposes an important weakness in current research: the model was created decades ago for early information systems and may not fully account for the complex and sometimes contradictory reactions people have toward modern AI.

Newer research suggests that people's decisions about using AI are not always straightforward. Instead of simply choosing to accept or reject a technology, users may experience ambivalence-feeling positive and negative about the system at the same time. Because TAM treats willingness as a single, one-directional concept, it may not capture this mix of enthusiasm and concern. This is especially relevant for AI, which raises questions about transparency, ethics, autonomy, and job security. To understand why users appreciate AI's

efficiency yet still hesitate due to mistrust or perceived risks, a more advanced perspective is needed.

Another issue in existing studies is the limited use of other theoretical models that might offer deeper insights but have not been sufficiently tested in AI-related contexts. Although TAM includes “actual system use” as an outcome, most researchers only measure people’s stated intentions rather than how they actually use AI in real-life situations. As a result, we know very little about how AI tools are truly adopted, continuously used, or abandoned in everyday library work. This gap weakens the generalizability of current findings and slows theoretical progress.

For researchers studying how librarians or users accept or resist AI, it is important to move beyond TAM and consider additional frameworks, such as UTAUT, Diffusion of Innovations, Expectation-Confirmation Theory, or dual-attitude models. These models help explain different user responses, including resistance, delay, or conditional acceptance. Using them together can give a more complete understanding of how people balance the benefits and risks of AI-enabled library services.

Even with these limitations, the literature agrees that AI plays an increasingly important role in libraries. AI tools can handle vast amounts of information and support tasks like classification, retrieval, and decision-making, functions that enhance and extend what librarians traditionally do. At the same time, this potential makes it essential to investigate how librarians and users actually use AI in their daily routines.

Finally, while TAM has provided a strong foundation for early studies, the rapid evolution of AI requires more diverse methods and theoretical approaches. Future research needs a more comprehensive framework that combines behavioral, cognitive, ethical, and socio-technical factors to better understand AI adoption in libraries and to advance both theory and practice.

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## **Analisando a adoção da Inteligência Artificial em serviços bibliotecários modernos: uma perspectiva do Modelo de Aceitação de Tecnologia**

**Abstract:** O principal objetivo desta pesquisa é analisar a adoção da Inteligência Artificial em serviços bibliotecários modernos sob a perspectiva do Modelo de Aceitação de Tecnologia. A incorporação de tecnologias de Inteligência Artificial às operações das bibliotecas tem o potencial de revolucionar a forma como a informação é gerenciada, recuperada e disponibilizada aos usuários. Esta metodologia delineia uma abordagem estruturada para analisar qualitativamente a literatura existente sobre a adoção da Inteligência Artificial em serviços bibliotecários modernos a partir da perspectiva do Modelo de Aceitação de Tecnologia. Ao sintetizar os resultados de diversos estudos, esta pesquisa busca fornecer insights valiosos sobre os fatores que influenciam a adoção da Inteligência Artificial e a aplicação do Modelo de Aceitação de Tecnologia nesse contexto. O estudo investiga a adoção e a aceitação de soluções baseadas em Inteligência Artificial em um ambiente bibliotecário contemporâneo, utilizando o Modelo de Aceitação de Tecnologia como referencial teórico. A pesquisa explora as percepções e atitudes de bibliotecários, funcionários e usuários em relação aos sistemas de suporte baseados em Inteligência Artificial nas bibliotecas, com foco especial na utilidade percebida, na facilidade de uso percebida, nas intenções comportamentais e no uso efetivo. O estudo também reflete sobre fatores regulatórios e variáveis externas que podem estimular a adoção da Inteligência Artificial em ambientes bibliotecários. Por meio de uma análise abrangente dos fatores do Modelo de Aceitação de Tecnologia no contexto da Inteligência Artificial e dos serviços de biblioteca, esta pesquisa oferece contribuições relevantes para bibliotecas que buscam implementar e aprimorar tecnologias de Inteligência Artificial para melhor atender suas comunidades. Além disso, o estudo fornece às bibliotecas orientações práticas e aplicáveis para integrar de forma eficaz tecnologias de Inteligência Artificial em seus serviços, promovendo maior eficiência, eficácia e satisfação dos usuários. A originalidade desta pesquisa reside na aplicação inovadora do Modelo de Aceitação de Tecnologia à adoção da Inteligência Artificial em serviços bibliotecários modernos. Ao abordar uma questão contemporânea com um referencial teórico robusto e ao apresentar dados empíricos, o estudo contribui com insights relevantes tanto para a comunidade acadêmica quanto para o campo profissional da Biblioteconomia. Destaca-se ainda por explorar áreas pouco investigadas, considerar variáveis específicas relacionadas à Inteligência Artificial e oferecer uma visão holística da adoção de tecnologias em bibliotecas.

**Palavras-chave:** inteligência artificial; serviços bibliotecários modernos; modelo de aceitação de tecnologia; bibliotecas digitais; interação humano-IA

## Authorship and Responsibility Statement

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**Critical review of the manuscript:** Oluwale O. Durodolu and Ganiyu Ojo Adigun

## Data availability statement

Not applicable.

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