



# AI-generated predictions for library futures: a comparative large language model analysis

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## Abstract

**Introduction.** This research examines Artificial Intelligence (AI) tools' predictions regarding the future of libraries within the framework of five fundamental elements: Building, collection, personnel, budget, and users. While existing literature examines AI's impact on library services from human perspectives, this study explores how AI tools themselves envision the future of libraries by analysing their outputs across different models.

**Method.** A qualitative approach was employed, consisting of structured question-answer sessions with five large language models (LLMs): ChatGPT, Claude, Grok, DeepSeek, and Gemini.

**Analysis.** Responses were analysed using inductive content analysis to identify common themes and divergent perspectives.

**Results.** Findings indicate strong paradigmatic convergence across all models. Despite differences in infrastructure, institutional origin, and training data, all tools anticipate a shift from libraries as static repositories to dynamic learning centres. Shared themes include hybrid physical-digital structures, personalisation, human-AI collaboration, and ethical governance. Collections are expected to become format-agnostic and open access-oriented; buildings to evolve into modular, multidisciplinary spaces; users to demand instant, personalised services; personnel to assume strategic, AI-literate advisory roles; and budgets to prioritise digital infrastructure and services.

**Conclusion.** By analysing AI tools' own discourse, this study contributes novel, data-driven insights for library managers, educators, and policymakers, while also demonstrating both the potential and limitations of LLMs as instruments for consistent analytical prediction.

## Introduction

In today's world, where Artificial Intelligence (AI) technologies are rapidly developing and transforming social institutions, libraries are also at the centre of this change (Cox et al., 2019; Cox and Mazumdar, 2024). In the digital information age, libraries are evolving from traditional information storage and access centres to spaces for social learning and interaction (Connaway, 2015), a transformation that is redefining libraries' core functions, service models, and social roles. As Gorman (2000) points out, while the library world is supported by the opportunities offered by technology, it also faces uncertainties and is undergoing changes that most of us can only vaguely comprehend. In this context, the question of what librarianship means in the 21st century is increasingly being debated both in academic literature and in the field.

The role of AI applications in social and organisational transformation has been extensively examined across various disciplines. The strategic importance of AI in data-driven decision-making processes has been analysed in fields such as business management (Mangal et al., 2024), customer relationship management (Al Kalach, 2025), healthcare (Maekawa et al., 2024), and urban planning (Zhang et al., 2025). Prior studies demonstrate that AI-supported predictive analytics significantly reshape organisational strategic decisions (Abul Kalam et al., 2024; Singh, 2020). In addition, the integration of big data analytics with business intelligence has been shown to strengthen decision-making capabilities and improve organisational performance (Rachakatla et al., 2023; Ramya et al., 2024). At the same time, data-driven insights contribute to increased operational efficiency while simultaneously intensifying ethical, accountability, and transparency requirements (Celestin et al., 2025; Hogan et al., 2021). Research on human-AI collaboration models further indicate that maintaining an appropriate balance between technological capabilities and human expertise is critical to sustainable organisational success (Mentzas et al., 2021).

In the field of library and information science, the impact of AI applications is becoming increasingly apparent. Singh and India's (2025) study reveals that AI technologies enhance library services, streamline operations, and improve user experiences, demonstrating AI integration across a wide range of applications, from automated cataloguing systems to personalised recommendation algorithms, chatbot applications, and digital preservation projects. Meesad and Mingkhwan (2024) address the transformative role of data analytics in modern library management, detailing how libraries have evolved from traditional practices to contemporary digital strategies and how data-centric approaches optimise collection development, user behaviour analysis, and service innovation. Panda and Kaur (2025) underscore that the integration of information management and AI enables user-centred and inclusive information access in library services, but that challenges such as ethical concerns, competency gaps, and infrastructure needs must also be considered in this process. Ajani et al. (2024) examined the impact of big data on library management in the Fourth Industrial Revolution era and found that librarians positively view big data's capacity to improve decision-making, optimise services, and deliver personalised user experiences.

Despite this extensive research across different disciplines, the question of what kind of predictions AI tools offer for the future of libraries, based on their own databases and learning processes, has not yet been systematically examined. Christou's (2023) strategy of using AI as a source, method, and analysis tool in qualitative research offers a new methodological framework to fill this gap. In particular, the capacity of large language models (LLMs) to generate data, analyse it, and develop insights demonstrates that these tools can be considered not only as objects of analysis but also as sources of systematic data analysis. However, the ethical issues, bias risks, and reliability concerns arising from the use of AI systems cannot be ignored. Therefore, controlling data quality, cross-referencing, observing ethical standards, and including the researcher's cognitive contribution in the process are critical when using AI in research.

This study aims to fill this gap in the literature by systematically examining AI tools' data-driven interpretations and predictions regarding the future of libraries. The research presents an evaluation within the framework of Ranganathan's (1931) Five Laws of Library Science. These include books are for use, every reader his/her book, every book its reader, save the time of the reader, and the library is a growing organism. It is also worth noting the five fundamental elements derived from these laws, building, collection, personnel, budget, and users, which are a key reference point in library science literature, and comparatively analyses AI tools' predictions regarding the future of these elements.

Beyond examining what AI predicts about libraries, this research also addresses an emerging methodological question: How consistent are LLMs when analysing the same research problem through identical analytical frameworks? By conducting parallel analyses with five different LLMs, this study provides empirical evidence regarding inter-model agreement, which has implications for understanding both the reliability of AI-generated insights and the dominant narratives embedded in their training data. However, this methodological dimension serves as a secondary contribution; the primary focus remains on understanding AI's vision of library transformation and its implications for strategic planning.

The study's main research question can be formulated as follows: What predictions do different LLMs offer regarding the future of the five fundamental elements of libraries, and what kinds of convergences or divergences exist among these predictions? The degree of alignment or divergence across different AI architectures provides both substantive insights into the future of libraries and methodological insights into the consistency of LLM-generated analyses. In seeking answers to this question, the research also questions how AI tools position the balance between technological determinism and human-centered values, how they envision the future of libraries' mission of democratising social knowledge, and whether their outputs reflect genuine analytical capacity or merely reproduce existing academic consensus.

The findings of this research have the potential to provide data-driven insights to library administrators and policymakers in their strategic planning processes, guide library and information science educators in their curriculum development processes and contribute methodologically to the academic literature by systematically examining AI's predictions about the institutional future. Furthermore, determining whether different AI tools offer similar or divergent predictions will also reveal important information about the reliability and potential biases of these technologies.

## Literature review

### AI as research instrument: Emerging considerations

The use of large language models (LLMs) in research contexts has recently garnered attention in methodological literature. Christou's (2023) framework for using AI as a source, method, and analysis tool in qualitative research emphasises the need for critical evaluation of AI-generated content, cross-referencing outputs, and maintaining researcher cognitive contribution. This framework acknowledges both the analytical potential and inherent limitations of LLMs, particularly their tendency to reproduce patterns from training data rather than engage in independent reasoning.

While the primary focus of this study is on AI's predictions about library futures, the comparative design, using five different LLMs with identical prompts, also allows for observation of inter-model consistency. This methodological aspect, though secondary to the substantive findings, provides additional value by revealing the extent to which different AI architectures converge on similar interpretations when analysing the same research problem.

## AI and data-driven approaches in library transformation

The emergence of AI and data-driven approaches as a defining element in the digital transformation of libraries has created a broad field of discussion in the literature on information and records management. In this context, studies examining the role of data analytics in library management indicate that analytical tools are increasingly used to support strategic planning, performance evaluation, and evidence-based resource allocation. Meesad and Mingkhwan (2024) demonstrate that data analytics enables libraries to move beyond intuition-based management by facilitating systematic analysis of usage data, service performance, and user needs, thereby reshaping managerial decision-making processes. Similarly, research investigating the contribution of AI-supported business intelligence tools to resource management and operational decision-making (Nova et al., 2025) shows that libraries are experiencing a clear shift from traditional management approaches toward data-driven decision-making processes. Complementary findings on the potential of big data to personalise and optimise library services further indicate that librarians have largely embraced the opportunities offered by these technologies (Ajani et al., 2024).

The literature addressing the direct effects of AI on library services suggests that libraries are undergoing a multi-layered transformation encompassing both internal operations and user-facing services. This application area, ranging from the use of robotic process automation and automated management applications in back-end operations (Cox & Mazumdar, 2024) to more visible services such as information discovery, chatbot-based advisory services, and user behaviour analytics (Baber et al., 2024; Singh & India, 2025). This expanding application area contributes to the evolution of libraries into faster, more intelligent, and increasingly user-focused institutions. Furthermore, studies noting that expert systems have long been employed in libraries as early forms of AI supporting human decision-making (Asemi et al., 2020) indicate that contemporary smart library ecosystems are further strengthened through the integration of technologies such as the Internet of Things (IoT), cloud computing, data mining, and emotional analysis (Gul & Bano, 2019). Research suggesting that the integration of information management and AI has become a central driving force of digital transformation also points to user-centred and inclusive service design as a core principle of this process (Panda & Kaur, 2025).

Studies that university librarians' knowledge of AI technologies is insufficient (Öztürk & Özel, 2021) indicate that although librarians use AI-based applications in their daily lives, their professional awareness of AI is low. Large-scale studies conducted with university library administrators (Çakmak & Eroğlu, 2024; Çuhadar et al., 2024) show that institutions have serious deficiencies in areas such as infrastructure, training, data management, and ethical framework creation in AI integration. Studies revealing public library personnel's generally positive but cautious approach to AI (Kavak, 2024) show that ethical risks and surveillance concerns influence professional attitudes. Parallel to this picture, studies defining AI literacy as a new paradigm for libraries (Demir, 2025) emphasise the educational role that institutions must assume in understanding, teaching, and ensuring the appropriate use of AI tools. The literature also highlights that AI, and big data will take the future of the profession to a different dimension in today's world, where the flow of data in libraries is rapidly increasing (Sarıçoban, 2025).

Research offering predictions about the future of libraries generally presents an optimistic perspective regarding the transformation AI will create in information services. SWOT (strengths-weaknesses-opportunities-threats) analyses pointing to AI's scalability, accuracy, and innovation capacity (Verma & Gupta, 2022) are supported by studies predicting that smart library technologies will become even more widespread soon (Basak et al., 2024; Halburagi & Mukarambi, 2023). However, studies emphasising the need to understand the functioning of algorithms and data-driven systems (Arlitsch & Newell, 2017) indicate that librarians should focus not only on their human aspects but also on new competencies such as digital literacy and AI

literacy. Studies discussing new questions that will shape the research agenda of AI in the context of libraries (Cox, 2021; Cox & Wang, 2025; Gasparini & Kautonen, 2022) raise fundamental questions about how user behaviour will change with AI, how professional competencies will evolve, and how AI will redefine library service models. Biometric analyses (Borgohain et al., 2024) showing an exponential increase in scientific production in the field indicate that AI-focused research energy will continue in the long-term. On the other hand, studies that systematically identify barriers to AI adoption (Shahzad et al., 2025) show that technological, financial, and cultural limitations can slow down implementation processes.

Research showing that this transformation involves not only technological but methodological and ethical dimensions also occupies an important place in the literature. Critical assessments of AI use, particularly in qualitative research (Christou, 2023), highlight the risks of AI systems producing bias, presenting incorrect data, and weakening researcher contribution, recommending that AI be used in research processes within a careful, controlled, and ethical framework.

## Method

This research was conducted using a qualitative approach that treats AI tools as objects of systematic data analysis. The methodological framework of the study was inspired by Christou's (2023) strategy of using AI as a source, method, and analysis tool in qualitative research, Coeckelbergh's (2020) approach to AI ethics, and Mayring's (2004) qualitative content analysis methodology. Christou's (2023) five fundamental evaluation criteria, including familiarizing oneself with the data produced by AI systems, filtering out biased content and addressing ethical concerns, cross-referencing information generated by AI, controlling the analysis process, and demonstrating the researcher's cognitive contribution at every stage of the process, were systematically applied throughout all stages of this research. While the primary objective is to understand AI tools' predictions about library futures, the parallel use of five different large language models (LLMs) also enables observation of inter-model consistency, providing secondary insights into the reliability of AI-generated analyses.

## Data collection

The data collection process consisted of systematic query-response sessions conducted with five different large language models (LLMs) on August 15, 2025. Five different AI tools were used in the study: ChatGPT (GPT-4 version), Claude (Anthropic), Grok (xAI), DeepSeek, and Gemini (Google). The selection of these tools was based on criteria such as widespread global use, diversity in institutional infrastructure, and training data sets. To ensure the reliability and reproducibility of the data collection process, access to all AI tools was conducted within the same time frame and under the same conditions.

The data collection strategy is based on a systematic information gathering process using structured questions within the framework of the five fundamental elements of a library. Standard questions prepared separately for each of the five fundamental elements were directed to each AI tool. To ensure the repeatability and consistency of the research, the questions posed to all AI tools were kept in a fixed prompt format. An example prompt structure is as follows:

*'How will the [building/collection/ personnel/budget/users] element change in the future of libraries? Please provide an assessment based on the information you have obtained from your own database and learning processes. Focus your response on specific trends, technological developments, and possible scenarios.'*

In this prompt design, AI tools are explicitly asked to generate responses based on their *own opinions*. As Christou (2023) notes, the specificity of commands given to AI systems and their alignment with research objectives directly affect the quality of the content produced. Therefore, each question was structured to activate the predictive analytical capabilities of AI tools, adopting an approach that requested future predictions rather than questioning the current situation.

The responses obtained from each AI tool were saved in separate files in Microsoft Word format, and no editing was performed to preserve the originality of the responses. Factual elements such as statistics, historical information, and direct quotations generated by the AI tools were carefully checked against academic databases and reliable sources to ensure accuracy. This verification process was carried out meticulously, particularly considering that AI systems can sometimes generate non-existent sources.

The use of multiple AI tools serves two purposes. Primarily, it provides a comprehensive picture of how AI conceptualises library futures across different model architectures. Secondly, it allows for assessment of consistency across models, revealing whether predictions reflect robust patterns in available data or are artifacts of training approaches. This comparative dimension adds methodological value to the study without shifting focus from the substantive research questions about library transformation.

### **Reproducibility and transparency measures**

To enhance the reproducibility and transparency of this research, several measures were implemented. First, all five AI tools were accessed on the same date, August 15, 2025, within a controlled timeframe to minimise temporal variations in model responses. Second, identical prompt structures were used across all models to ensure comparability. Third, all AI-generated responses were preserved in their original form without editing.

However, given the non-deterministic nature of large language models (LLMs), exact replication of results cannot be fully guaranteed. The responses generated represent a specific instance of each model's output and might vary slightly if the same prompts were used at different times or under different system conditions. This limitation is inherent to LLM-based research and should be considered when interpreting findings. Despite this limitation, the high degree of convergence across five different models suggests the robustness of the identified patterns.

### **Data analysis**

The collected data was subjected to inductive summarising analysis using Mayring's (2004) qualitative content analysis methodology. The content analysis approach offers three basic techniques for systematic text analysis: Summarising content analysis, explanatory content analysis, and constructive content analysis. In this study, summarising content analysis was preferred to extract the main themes and concepts from the responses of AI tools.

The analysis process was carried out in three stages. In the first stage, the responses obtained from each AI tool were categorised into separate categories based on the five fundamental elements of a library. This categorisation process formed the basis for structuring the data and comparative analysis. In the second stage, keywords, concepts, and themes were extracted inductively from the AI tools' predictions within each category. In this process, meaningful patterns and recurring concepts were identified from the raw data, in line with Braun and Clarke's (2019) thematic analysis principles. In the third stage, the convergences and divergences

between the predictions of five different AI tools were examined comparatively, and common themes and differences were systematically coded.

During the analysis process, in line with Christou's (2023) principle of 'researcher cognitive contribution,' the content produced by AI tools was critically evaluated, and potential biases, inconsistencies, or reliability issues were identified. Considering that biases in AI systems' training data could affect the results, areas where different AI tools offered similar or conflicting predictions were carefully examined. This approach, consistent with the human-AI collaboration model proposed by Mentzas et al. (2021), ensured that the data-driven insights provided by technological tools were balanced with human judgment and critical evaluation.

The keywords and concepts compiled because of the analysis have been organised into tables based on five key elements. These tables aim to visualise both the individual predictions of each AI tool and the consensus among the tools. The tables presented in the Findings section enable readers to evaluate the predictions of AI tools comparatively and contribute to increasing the transparency of the research.

### **Ethical considerations and limitations**

The ethical dimension of the research was addressed in line with Christou's (2023) principle of 'filtering out biased content and addressing ethical concerns.' Potential biases, discriminatory statements, or ethically problematic predictions in the content generated by AI tools were systematically screened, and in identified cases, these predictions were excluded from the research findings. Furthermore, the use of AI tools was clearly stated in the methodology section of the research, adhering to the principle of scientific transparency.

The main limitations of the research can be stated as follows: First, due to the constantly updated nature of AI tools, the findings obtained in this study are limited to a specific time frame. Second, due to the lack of access to the training data sets of AI tools, it was not possible to fully determine which information sources the predictions were based on. Third, the prompt design and question structure used in the research are factors that could influence the responses obtained. Despite these limitations, the systematic approach of the research and the use of multiple AI tools are considered important steps towards increasing the reliability of the findings.

## **Findings**

In this section, data obtained from systematic query-response sessions conducted with five different large language models (LLMs), ChatGPT, Claude, Grok, DeepSeek, and Gemini, are presented comparatively within the framework of the five fundamental elements of a library. The analysis shows striking convergences and some divergences in AI tools' predictions about the future of libraries.

### **AI predictions regarding the collection element**

Analysis of outputs from five AI tools regarding the future of library collections shows a strong consensus that collections will evolve from a 'static repository' model to a 'dynamic and adaptable ecosystem' model. All tools highlighted that collection management will evolve into a demand-driven and data-driven structure.

ChatGPT predicts that collections will become 'format-agnostic,' stating that text, audiovisual, research data, software packages, and interactive simulations will be managed under a single integrated collection logic. Similarly, Claude highlighted the concept of an 'access-focused model,' emphasising the importance of specialising in providing access to various resources rather than physical ownership. Grok's 'living structure' metaphor, DeepSeek's 'dynamic

collection' concept, and Gemini's 'dynamic and personalised information ecosystem' expression all describe the same transformation paradigm using different terminology.

Regarding the balance between printed and digital resources, all AI tools agree that the balance will shift in favour of digital, but they stress that printed materials will not disappear entirely. ChatGPT and Claude indicate that printed preservation will continue for rare works, local history, and cultural heritage materials, while DeepSeek and Gemini predict that printed materials will evolve into a 'qualified and symbolic role.' Grok, on the other hand, offers a more normative perspective, stressing that printed books must be 'preserved as cultural heritage,' otherwise emotional ties will be lost.

There is complete agreement among the five tools on open access. All tools predict that open access resources will become the cornerstone of library collections in the future. ChatGPT highlights the importance of open access funds and institutional repositories, while Claude states that open access will take precedence over the costs of traditional publishing models. DeepSeek predicts that institutional repositories and open access repositories will gain importance, while Gemini envisions a system where AI will automatically scan, categorise and evaluate the reliability of open access resources.

Regarding the impact of AI-generated content on collection policies, all tools agree that this content will require quality control, verifiability, and ethical standards. ChatGPT states that quality and bias control protocols need to be defined for 'synthetic content,' while Claude anticipates the development of new critical evaluation frameworks for the quality control, accuracy assessment, and ethical compliance of this content. Grok highlights that AI-generated content requires source attribution and human oversight, while DeepSeek notes the need to regulate copyright and ethical dimensions.

In this context, the summary comparison presented in Table 1 systematically compares the predictions of five AI tools, comprehensively revealing the new paradigms and trends emerging in collection management. The information in the table presents side-by-side each tool's approach to the fundamental structure of the collection, such as ChatGPT's 'format-agnostic' model, Claude's 'access-focused' framework, or Gemini's emphasis on a 'personalised ecosystem', their perspectives on the print-digital balance, their attitudes toward open access, and the policy approaches they propose for managing AI-generated content. This side-by-side presentation clearly shows which components are common and where differences lie in future collection strategies.

| AI Tool  | Core Paradigm                    | Print-Digital Balance                         | Open Access Emphasis              | AI Content Approach              |
|----------|----------------------------------|-----------------------------------------------|-----------------------------------|----------------------------------|
| ChatGPT  | Format-agnostic, usage-focused   | Digital-focused, rare works will be preserved | Institutional archives + AE funds | Provenance, quality control      |
| Claude   | Access-focused, hybrid structure | Digital twins + physical preservation         | Will be the cornerstone           | Academic standards               |
| Grok     | Live structure, dynamic          | In favour of digital, cultural heritage       | Democratisation                   | Citation + verification          |
| DeepSeek | Dynamic, data-driven             | Qualitative-symbolic role                     | Institutional archives            | Copyright and ethical regulation |
| Gemini   | Personalised ecosystem           | Focus on rare works                           | Automated scanning and evaluation | Curatorial role                  |

**Table 1.** AI tools' predictions and key concepts regarding the future of collection.

### AI predictions for building elements

AI-generated predictions regarding the future functions of library buildings show a strong consensus on the transformation of physical spaces from 'information repositories' to 'learning and creation centres.' All tools predict that book shelving systems in buildings will be minimised and spaces will be repurposed.

ChatGPT states that buildings will become 'multi-disciplinary production and meeting centres,' emphasising that digital production studios, data/media labs, makerspaces, and prototyping areas will be key functions. Claude's concept of a 'learning and creation centre,' Grok's 'community hubs,' DeepSeek's 'experience centre,' and Gemini's "multi-functional community, collaboration, and learning centre' definitions reflect the same vision of transformation.

In terms of anticipated changes in physical design, the five AI tools converge around the concept of modular and flexible design. ChatGPT points to modular furniture, acoustic zoning, and flexible energy/infrastructure channels, while Claude focuses on modular designs and smart building technologies equipped with Internet of Things (IoT) sensors. Grok suggests that modular structures and AI-supported robots will be used in shelf management, while DeepSeek refers to mobile shelving systems and foldable furniture for multipurpose rooms. Gemini indicates technological integrations such as smart lighting, climate control, and location systems, in addition to flexible, modular, and adaptable designs.

Regarding accessibility, ChatGPT states that advanced application of universal design principles is necessary, while Grok articulates in normative terms that universal design principles should not be forgotten. Although the other tools do not directly address this issue, it can be said that their emphasis on user-centred design indirectly encompasses accessibility principles.

Regarding the evolution of the social, cultural, and technological functions of spaces, all AI tools agree that libraries' role as a 'third place' will be strengthened. ChatGPT describes the concept of a public learning hub where the digital divide is bridged and media literacy and AI literacy training are provided, while Claude frames positioning libraries as centres for social cohesion, digital literacy education, and lifelong learning. Grok presents the necessity of remaining a 'third place' and the proposal to combine the metaverse with the physical world, while DeepSeek states that it will be a meeting, discussion, and production point.

There is also strong consensus among the tools regarding Augmented Reality/Virtual Reality (AR/VR) technologies. ChatGPT highlights AR/VR experience areas, Claude virtual reality laboratories, DeepSeek interactive environments, and Gemini VR laboratories. Grok, while not mentioning the use of AR/VR, uses the term virtual reality corners.

In this context, the comparative framework presented in Table 2 systematically brings together the five AI tools' predictions regarding building elements, revealing the multifunctional structure that library spaces will take on in the future. The table highlights the conceptualisation of each tool regarding building function, such as ChatGPT's 'multidisciplinary production centre', Grok's 'community hub', or DeepSeek's 'experience centre' definitions, the dimensions of modularity and flexibility they emphasise in physical design, their expectations regarding the social-cultural role of libraries, and their projections for technology integration.

| AI Tool  | Functional Definition                | Physical Design Emphasis            | Social-Cultural Role     | Technology Integration    |
|----------|--------------------------------------|-------------------------------------|--------------------------|---------------------------|
| ChatGPT  | Multi-disciplinary production centre | Modular furniture, acoustic zoning  | Digital divide bridging  | AR/VR, data visualisation |
| Claude   | Learning and creation centre         | Modular design, IoT sensors         | Social cohesion          | VR laboratories           |
| Grok     | Community hub                        | Modular structures, AI robots       | Third space              | Metaverse integration     |
| DeepSeek | Experience centre                    | Mobile shelving, multipurpose rooms | Meeting-production point | AR/VR, IoT                |
| Gemini   | Community centre                     | Flexible-adaptable design           | Social events            | VR lab, smart systems     |

**Table 2.** AI tools' predictions and key concepts regarding the future of building elements.

### AI predictions in user experience

AI-generated predictions regarding how user expectations will change in the future focus on themes of personalisation, instant access, and multi-channel services. Five AI tools agree that users will transition from being passive consumers of information to active producers of information and individuals who demand experiences.

ChatGPT states that users will expect 'instant, evidence-based, personalised, and multi-channel' services, emphasising 24/7 consultation/support and natural language query features. Claude highlights the trio of personalisation, instant access, and multi-channel service delivery, predicting 24/7 accessible digital services and AI-powered personal assistants. Grok underscores the expectation of instant and personalised services with 24/7 chatbots, while DeepSeek defines services in terms of personalised, instantly accessible, and interactive services. Gemini highlights the expectation of instant access through fast, easy, and personalised services via mobile applications and AI-powered chatbots.

Analysis of responses reveals similar predictions regarding the diversification of user profiles. Claude predicts demographic homogenisation with the aging of digital native generations and the increasing digital literacy of the elderly population, while DeepSeek states that the user profile will become more heterogeneous, including with students, researchers, entrepreneurs, and senior. Gemini emphasises that user profiles will move away from being 'one-size-fits-all book readers' to encompass different groups such as researchers, students, artists, entrepreneurs, and lifelong learners.

In terms of the transformation in information search behaviour, all AI tools converge on natural language interfaces and semantic/contextual search concepts. ChatGPT states that search behaviour will become 'question-focused' and that users will want summary/comparative answers and source-specific chains of evidence. Claude highlights voice-based query systems, visual search technologies, and natural language processing (NLP) capabilities, while DeepSeek emphasises natural language querying and the expectation that users will be able to ask complex questions in natural language and instantly access relevant sources. Gemini states that information search behaviour will evolve from keyword searches to semantic and contextual searches, and that AI-powered systems will understand users' search intent.

Regarding the development of personalised service capabilities, analysis of responses from the five AI tools reveals consensus that personalisation will be achieved at a high level based on machine learning algorithms and user data analysis. However, Claude and Grok particularly emphasise that personalisation must be supported by privacy-by-design principles and user

control panels, addressing the ethical dimension. ChatGPT states that personalisation will be offered through secure integration with corporate identity, Learning Management Systems (LMS), citation managers, and researcher profiles, while DeepSeek highlights AI-based recommendation engines that analyse the user's past searches, interests, and behaviour patterns.

In this context, the information in Table 3 presents AI predictions regarding the user element within a comparative framework, comprehensively revealing how the future library user profile will be reshaped. The table shows each AI tool's transformation of user expectations, such as ChatGPT's 'instant and evidence-based' demand structure or Claude's predicted '24/7 accessibility' requirement, the diversification or homogenisation trends in user profiles, the evolution of search behaviours towards natural language, voice search, or contextual-semantic orientation, and personalisation approaches such as privacy-focused, behaviour analysis-based, or AI algorithm-shaped models.

| AI Tool  | Expectation Change                     | Profile Transformation                  | Search Behaviour                   | Personalisation Approach      |
|----------|----------------------------------------|-----------------------------------------|------------------------------------|-------------------------------|
| ChatGPT  | Instant, evidence-based, multi-channel | Community-generated content integration | Question-focused, natural language | Enterprise system integration |
| Claude   | 24/7 access, predictive services       | Demographic homogenisation              | Voice-visual search, NLP           | Privacy-first                 |
| Grok     | Instant, personalised                  | Various profiles                        | Predictive behaviour               | Data privacy is a priority    |
| DeepSeek | Instant, interactive                   | Heterogeneous structure                 | Natural language query             | Behaviour analysis-based      |
| Gemini   | Fast, mobile access                    | Different group diversity               | Semantic-contextual                | AI algorithms                 |

**Table 3.** AI tools' predictions and key concepts regarding the future of the user element.

### AI predictions regarding personnel

AI-generated predictions regarding the duties, roles, and responsibilities of library personnel show a striking alignment with the transformation of personnel from 'information custodians' to 'information experience designers' and 'strategic advisors.' All tools predict that routine tasks will be delegated to AI, and personnel will transition to more strategic, creative, and advisory-focused roles.

ChatGPT states that the personnel role will expand from the 'selection-evaluation-reference' triad to the 'data curation-research support-instructional design-technology management' axis. Claude describes the transformation from 'information guardian' to 'information experience designer' and 'digital literacy trainer,' while Grok indicates that personnel will focus on strategic roles, such as user guidance and, ethical decisions,) rather than routine tasks. DeepSeek predicts a shift from roles such as 'cataloguer' or 'reference librarian' to roles such as 'data analyst,' 'AI trainer,' 'digital content curator,' and 'technology consultant.' Gemini similarly anticipates a shift from routine tasks to highly specialised roles such as 'data analyst, information architect, digital curator, and community manager.'

Regarding the new skills and competencies that personnel should possess, the five AI tools show strong consensus on data literacy, AI literacy, and digital ethics. ChatGPT enumerates skills such as data literacy, basic statistics and visualisation, Application Programming Interface (API) and

logic integration, research data lifecycle, algorithmic bias and ethics, and prompt design. Claude highlights the importance of expertise in data analysis, basic programming, user experience (UX) and user interface (UI) design, digital project management, AI tool usage, information literacy education, critical thinking pedagogy, and digital citizenship education. Grok considers AI literacy, data analysis, and ethical AI management skills as prerequisites, while DeepSeek highlights data literacy, basic programming, like Python and R, AI and machine learning concepts, digital content management, ethics, and digital privacy knowledge.

Regarding the division of labour between AI and human personnel, all tools adopt a 'collaborative model' approach. ChatGPT states that routine, high-volume, and repetitive tasks will be assigned to AI, while contextual evaluation, ethical/privacy decisions, complex research strategy, education, and community work will be left to humans. Claude uses the concept of a 'complementary model,' emphasising that while AI systems handle routine queries, basic information searches, and standard procedures, human personnel will focus on complex research consulting, ethical evaluations, creative problem solving, and user interactions requiring empathy. DeepSeek states that human-AI collaboration will be optimised with 'human-in-the-loop' models, while Gemini predicts that human-centred and creative tasks, such as community management, education, and personal counselling,) will be performed by humans, and repetitive and data-driven tasks will be performed by AI.

In this context, Table 4 systematically compares AI predictions regarding the future of personnel, clearly revealing the direction of professional role transformation in libraries. The information in the table includes the new roles that personnel will assume for each AI tool, such as 'data curation' predicted by ChatGPT or 'information experience design' defined by Claude, the new skill sets that will be required, like data literacy, UX/UI design, programming, and ethical AI knowledge, etc.), division of labour models, such as delegation of routine tasks to AI, human-in-the-loop structures, complementary and collaborative models, and the nature of the human-AI relationship in examples like human-controlled automation, hybrid work, or an AI assistant.

| AI Tool  | Role Transformation                 | New Skills                            | Work Division Model          | Human-AI Relationship       |
|----------|-------------------------------------|---------------------------------------|------------------------------|-----------------------------|
| ChatGPT  | Data curation, instructional design | Data literacy, prompt design          | Routine AI, Strategic Human  | Human-controlled automation |
| Claude   | Information experience designer     | Data analysis, UX/UI, digital project | Complementary model          | Hybrid work                 |
| Grok     | Strategic roles, ethical decisions  | AI literacy, ethical AI               | Collaborative model          | Complementary               |
| DeepSeek | Data analyst, technology consultant | Programming, AI concepts              | Human-in-the-loop            | AI assistant                |
| Gemini   | Digital curator, community manager  | Data literacy, digital ethics         | Human-centred/Creative Human | AI assistant                |

**Table 4.** AI tools' predictions and key concepts regarding the future of the personnel element.

### AI predictions on budget allocation

AI predictions regarding the future distribution of library budgets show complete consensus that technology investments and digital services will take priority. Five AI tools predict that the share allocated to traditional print material purchases will decrease and that the budget will shift to digital infrastructure, software licenses, and technology renewal funds.

ChatGPT indicates that licenses, integration and security infrastructure, data storage/backup, research data services, digitization, and preservation will be prioritised, while emphasising that the total cost of ownership (TCO) will include software licensing, cloud infrastructure, integration, cybersecurity, and data governance items. Claude predicts that technology infrastructure, digital services, and personnel development will take priority, with 40-50% of the budget going to technology investments. Grok states that technology and digital services should take priority, emphasising that AI investments will save money in the long run.

Regarding the impact of technology investments on the budget, all tools agree that despite high initial costs, they will provide operational efficiency and cost savings in the long-term. ChatGPT states that costs may increase in the short term, but the decrease in cost per use, improvements in access speed and impact measurement will strengthen the return on investment. Claude argues that although initial investment costs are high, automation and increased efficiency will lead to cost savings in the long-term. DeepSeek indicates that although technology investments constitute a significant cost item, they will help achieve savings by providing operational efficiency in long-term.

Regarding the balance of resources between traditional and digital services, AI tools predict different ratios, but all agree that digital services will dominate. ChatGPT states that a program-based budgeting model will be adopted and that the balance will be dynamically adjusted through periodic 'zero-based' justification. Claude predicts a 70/30 balance in favour of digital services, while Grok advocates a hybrid model approach. DeepSeek and Gemini emphasise that the balance will be shaped according to the library's mission and the needs of the audience it serves, noting that digital may take precedence in research libraries, while physical space and community events may take precedence in public libraries.

Table 5, which complements these findings, presents a comparative overview of AI tools' predictions regarding the future of budgetary elements, thereby outlining how libraries' financial planning approach will be reshaped within an analytical framework. The table highlights each tool's priority investment areas, such as ChatGPT's emphasis on licensing, security, and research data management, or Claude's prediction of a 40-50% allocation to technology infrastructure), the impact of the technology on the budget like in automation-driven efficiency, changes in total cost of ownership, or long-term savings expectations, their different approaches to the digital-traditional service balance, and the budget models they propose, such as zero-based budgeting, cost optimisation, flexible budgeting, or strategic management models.

| AI Tool  | Priority Areas                       | Technology Impact                   | Digital-Traditional Balance      | Budget Model         |
|----------|--------------------------------------|-------------------------------------|----------------------------------|----------------------|
| ChatGPT  | Licensing, Security                  | TCO increase, long-term savings     | Program-based                    | Zero-based budgeting |
| Claude   | Technology infrastructure (40-50%)   | Automation-efficiency               | 70/30 in favour of digital       | Cost optimisation    |
| Grok     | Technology-digital services          | Long-term savings                   | Hybrid model                     | Equal support        |
| DeepSeek | Digital infrastructure, AE financing | Operational efficiency              | Mission-based                    | Flexible budget      |
| Gemini   | Technology, digital services         | High at the beginning, then decline | Depending on the target audience | Strategic management |

**Table 5.** AI tools' predictions and key concepts regarding the future of budgeting.

## Cross-model convergence: Implications for library futures

The comparative analysis of outputs from five different large language models (LLMs) reveals findings significant both for understanding the future of libraries and for assessing the consistency of AI-generated analyses. From a substantive perspective, the remarkable paradigmatic convergence provides robust evidence about likely directions of library transformation. From a methodological perspective, the high degree of alignment across different AI architectures, each developed by distinct organisations with proprietary training data, suggests that LLMs can produce consistent interpretations when analysing structured research questions. This convergence strengthens confidence in the substantive predictions while also demonstrating the potential utility of LLMs as complementary analytical tools. A comparative analysis of the predictions of five different AI tools demonstrates a striking paradigmatic convergence regarding the future of libraries. Although there are terminological differences between the tools, a strong consensus is observed in the fundamental transformation vision. All tools show clear alignment on the concepts and themes of the hybrid model, personalisation, human-AI collaboration model, ethics, and privacy.

The concept of the hybrid model has been adopted as a common vision by all AI tools. The prediction that libraries will be neither entirely digital nor entirely physical, but rather structures that strategically combine the two worlds, is present in all five tools. This hybrid structure signals a shift from the traditional repository concept that houses physical resources to a dynamic learning centre model that facilitates access to online resources.

The theme of personalisation is systematically emphasised in all six elements. The shaping of collections according to user behaviour, the flexible design of spaces to respond to different needs, the customisation of services according to individual profiles, and the positioning of personnel as user experience designers show that personalisation will permeate all layers of libraries.

The human-AI collaboration model stands out, particularly in the analysis of the personnel element, and has been adopted by five tools. The complementary model, in which AI does not replace humans but rather frees them from routine tasks, allowing them to focus on more strategic, creative, and empathy-requiring tasks, is an approach shared by all tools.

There are strong awareness and a remarkable consensus among the tools regarding ethical and privacy issues. The need to seriously address issues such as algorithmic bias, data privacy, the digital divide, and transparency is emphasised in all five tools. This finding shows that AI tools are aware of their own potential risks and propose proactive measures to manage them.

Differences between the tools are mostly evident in the degree of emphasis and style of expression. For example, Grok uses more prescriptive language to emphasise 'what should be,' while DeepSeek and Gemini adopt a more descriptive approach. Claude uses more detailed and academic terminology compared to other tools, while ChatGPT focuses on technical and operational details. However, these stylistic differences do not overshadow the consensus on the fundamental insights.

## Discussion

The findings of this research indicate that AI tools' predictions about the future of libraries are not random or inconsistent but rather show systematic alignment around certain paradigmatic orientations. This convergence is significant at two levels. Substantively, it provides robust evidence about the likely directions of library transformation, as similar predictions across five

different AI architectures suggest these trends are well-documented in multiple data sources. Methodologically, it demonstrates that large language models (LLMs) can produce consistent analytical outputs when applied to structured research frameworks, though this consistency may reflect the reproduction of dominant narratives in training data rather than independent analysis. While the primary contribution of this study lies in understanding AI's vision of library futures, the methodological observations offer secondary insights into the potential and limitations of LLMs as research tools.

The common adoption of the hybrid model concept by all tools is particularly noteworthy. This finding shows that AI tools envision the future of libraries not as entirely digital or entirely physical, but as structures that strategically combine the two worlds. This synthesis between the 'data-centric approach' emphasised by Meesad and Mingkhwan (2024) and the 'access-focused model' defined by Cox and Mazumdar (2024) indicates that AI tools see libraries as institutions undergoing not only technological transformation but also a transformation of their mission.

The systematic emphasis on personalisation across all six elements suggests that AI tools foresee user experience playing a central role in the future of libraries. This finding corroborates Baber et al.'s (2024) emphasis on 'user-centred information management' and Nova et al.'s (2025) proposal for 'individualized service delivery.' However, the fact that all AI tools emphasise the need to balance personalisation with privacy protection shows that the ethical dilemmas highlighted by Cox and Mazumdar (2024) are internalized in AI's own learning processes.

Perhaps the most striking finding is that the human-AI collaboration model has been adopted by five tools. AI-generated outputs indicate patterns suggesting complementary rather than replacement roles in their own future, but rather that they are technologies that complement and empower humans. This finding reflects Arlitsch and Newell's (2017) vision of 'machines supporting humans' and Gasparini and Kautonen's (2022) observation of 'tension between techno-optimism and fear of machines.' This 'complementary model,' where AI tools handle routine tasks while leaving strategic, creative, and empathy-requiring tasks to humans, parallels the 'changing role of personnel' discussed in Cox's (2021) design scenarios.

The strong consensus among tools on ethical and privacy issues is particularly important. All tools underscore the need to seriously address issues of algorithmic bias, data privacy, the digital divide, and transparency. This finding suggests that Christou's (2023) principle of 'filtering biased content and addressing ethical concerns' is applicable not only to AI users but also to AI-generated discourse. Moreover, the fact that AI tools identify potential risks associated with their outputs and propose proactive mitigation strategies indicates that the necessity of 'reducing algorithmic bias' and 'protecting user privacy,' as emphasised by Meesad and Mingkhwan (2024), is also present in AI's own discourse.

These findings are in systematic dialogue with the existing literature and reveal some unexpected important differences. The AI tools' hybrid model prediction is consistent with the 'potential for AI to be integrated with library operations' defined in Verma and Gupta's (2022) SWOT (strengths-weaknesses-opportunities-threats) analysis. However, the findings of the research show that AI tools evaluate this integration not only in terms of operational efficiency but also in the context of strengthening the social mission of libraries. Gul and Bano's (2019) concept of 'three components of smart libraries' (smart technologies, smart people, smart services) is directly reflected in the predictions for AI tools. All tools emphasise that technology alone is not sufficient; personnel and services must also transform.

Basak et al.'s (2024) prediction that 'AI will increase the importance of libraries' is strongly supported by the findings of this study. AI tools predict that libraries will become 'indispensable' in the digital age because they are rare institutions that combine technological sophistication with human-centred values. This finding confirms Halburagi and Mukarambi's (2023) observation of the 'promising future of AI technology' while proposing a more specific mechanism: The future of libraries depends on their capacity to balance technological innovation with social responsibility.

Predictions regarding AI tools' impact on personnel transformation are closely related to the five use cases defined by Cox and Mazumdar (2024). Specifically, the roles of 'data and AI literacy' and 'supporting data scientist communities' align with the concepts of 'data curation,' 'research data management,' and 'digital curation' predicted by AI tools. However, an unexpected finding is that AI tools emphasise AI-specific skills such as 'prompt engineering' and 'request design.' These skills are not explicitly defined in Cox and Mazumdar's (2024) framework, suggesting that AI tools propose a new competency area related to their own use.

The 'insufficient level of AI knowledge' identified by Öztürk and Özel (2021) and the 'need for training' highlighted by Çuhadar et al. (2024) demonstrate the extent of the personnel transformation anticipated by AI tools. AI tools predict not only the support of existing tasks by AI but also the emergence of entirely new roles and responsibilities. Demir's (2025) observation that 'AI literacy creates a new paradigm for libraries' is strongly supported by the findings of this study.

Predictions regarding user expectations for AI tools show significant parallels with studies in the literature. Asemi et al.'s (2020) observation that 'users' information behaviour is a good guide for designing intelligent systems' directly aligns with AI tools' emphasis on user profile analysis and behaviour prediction. However, the study's findings show that AI tools position personalisation not only as a technical capability but also as an ethical responsibility.

Claude and Grok's particular emphasis on the need for personalisation to be supported by 'privacy-by-design principles' directly addresses the 'privacy and security' question on the research agenda of Cox and Wang's (2025) 'ethical issues of AI.' This finding also validates Kavak's (2024) observation regarding 'public library workers' concerns about the risk of misuse for surveillance purposes.'

The predictions regarding the budget distribution of AI tools shed light on an area that has not been addressed in detail in the literature. The '70/30 in favour of digital' ratio predicted by Claude shows that digital transformation is inevitable, despite the 'financial difficulties' identified by Shahzad et al. (2025). The concepts of 'program-based budgeting' and 'zero-based budgeting' emphasised by ChatGPT are consistent with the 'strategic resource allocation' approach proposed by Nova et al. (2025).

An unexpected finding is that all AI tools predict 'long-term cost savings.' This prediction is particularly important considering the concerns of library directors in various countries, such as Türkiye, as documented by Çakmak and Eroğlu, 2024. While acknowledging that AI tools may have high initial investment costs, they argue that automation and increased efficiency will offset these costs.

Perhaps the most striking finding is that AI tools explicitly acknowledge their own potential biases and ethical risks and offer concrete suggestions for managing them. Christou's (2023) principles of 'filtering out biased content' and 'addressing ethical concerns' are directly reflected

in the discourse of AI tools. All tools recommend measures such as transparent data management, regular algorithm audits, and user approval mechanisms.

This finding shows that, despite Cox and Mazumdar's (2024) concerns that 'AI symbolically privileges white male identity' and issues of 'equality, diversity, and inclusion,' AI tools are aware of these problems and offer solutions. However, the extent to which AI tools implement these recommendations remains a separate research question.

Some of the study's findings are predictable based on the literature. For example, the shift towards digital resources (Verma and Gupta, 2022), the transition of personnel to strategic roles (Cox and Mazumdar, 2024), and users' demands for personalised services (Asemi et al., 2020) were already discussed in the literature. This research demonstrates that these predictions are also shared by AI tools, revealing that these trends have strong data-driven support.

However, some findings were unexpected and have not been sufficiently addressed in the literature:

- The fact that five tools with different institutional infrastructures offer such similar predictions was not anticipated in the literature. Gasparini and Kautonen (2022) identified motivations ranging from 'techno-optimism to machine fear' in libraries' approach to AI. However, the fact that the AI tools themselves present such a consistent vision suggests that a particular narrative about the future of libraries is dominant in the training datasets of these tools.
- Level of ethical awareness: It was unexpected for AI tools to acknowledge their own risks so explicitly and offer management suggestions. Christou (2023) emphasised that AI systems are 'prone to bias,' but the fact that AI tools recognise these biases themselves and suggest mitigation strategies has not been sufficiently addressed in the literature.
- The universality of the hybrid model: The fact that not all AI tools foresee a future that is either entirely digital or entirely physical points to a more balanced vision, contrary to some polarized predictions in the literature, such as the 'all-digital library' (Halburagi and Mukarambi, 2023) or the 'rediscovery of physical space' (Gul and Bano, 2019).

### **Methodological observations: Consistency across AI architectures**

While the primary focus of this study is on substantive predictions about library futures, the research design enables secondary observations about the consistency of large language model (LLM)-generated analyses. The high degree of convergence across five different AI architectures, ChatGPT (OpenAI), Claude (Anthropic), Grok (xAI), DeepSeek, and Gemini (Google), is noteworthy. These models were developed independently by different organisations, likely using different training datasets and architectural approaches. Yet they produced remarkably similar predictions across all five library elements.

This convergence can be interpreted in two ways. Optimistically, it suggests that when multiple independent AI systems arrive at similar conclusions, these predictions may reflect robust patterns in available evidence about library transformation. The alignment could indicate that these trends are well-documented across diverse sources in the training corpora. More cautiously, the convergence might reflect shared biases in training data or the reproduction of dominant academic narratives rather than independent analytical insight. LLMs do not reason independently; they generate outputs based on learned patterns. The observed consistency may therefore represent consensus in existing scholarly discourse rather than novel predictive capacity.

These observations have implications for the use of LLMs in research contexts. The consistency demonstrated here suggests that AI tools can be valuable for identifying and synthesising dominant themes in existing literature and professional discourse. However, they should be understood as sophisticated pattern-recognition instruments rather than independent analytical agents. Their outputs provide useful starting points for human analysis but require critical evaluation, particularly regarding potential blind spots, emerging trends not yet well-represented in training data, and minority perspectives that may be underweighted in consensus-driven outputs.

## Conclusion

This research fills an important gap in the literature by systematically examining AI-generated predictions about the future of libraries within the framework of the five fundamental elements. The study makes contributions at two interconnected levels. Primarily, it provides comprehensive insights into how AI tools conceptualise library transformation, offering evidence-based guidance for library managers, educators, and policymakers. Additionally, by comparing outputs from five different large language models (LLMs) using identical analytical frameworks, it offers methodological insights into the consistency and limitations of AI-generated analyses, demonstrating both their potential utility and the need for critical human evaluation. tools' data-driven predictions about the future of libraries within the framework of the five fundamental elements of a library.

Findings from query-response sessions conducted with five different LLMs, ChatGPT, Claude, Grok, DeepSeek, and Gemini, indicate that AI tools envision libraries' future as institutions transforming from 'static repositories of information' into 'dynamic learning centres.' At the heart of this transformation vision are the themes of hybrid models (physical-digital integration), personalisation, human-AI collaboration, and ethical governance. The most striking finding of the research is the paradigmatic convergence shown by AI tools with different institutional infrastructures in these predictions; this indicates that a certain narrative regarding the digital transformation of libraries is dominant in the training datasets of AI tools.

The study's original contribution to the literature is multidimensional. First, the methodological approach, which treats AI tools not only as analytical tools or application objects but also as sources of systematic data analysis, expands the existing methodological frameworks for AI use in qualitative research. While the existing literature examined how AI could be applied to library services, this research raises the question, 'How do AI tools predict the future of libraries?', making it possible to evaluate the impact of AI on libraries not only from the perspective of human researchers but also from the perspective of AI itself. Second, the re-examination of the classic library science framework in the age of AI demonstrates how core theoretical foundations evolve amid digital transformation and reveals how the five fundamental elements of a library (building, collection, personnel, budget, and users) are being redefined and reinterpreted by AI tools.

The practical implications of the study's findings are significant. AI tools' predictions regarding personnel transformation. New skills such as data curation, research data management, AI literacy, and prompt engineering, provide a concrete curriculum framework for library education and in-service training programs. Given that librarians' AI knowledge is particularly inadequate and the need for training is urgent, the findings of this research provide a clear roadmap for the skills librarians need to develop. Librarians must learn not only to use AI tools but also to understand how AI is transforming library services so they can make strategic decisions. In terms of budget planning, the digital-heavy resource allocation and program-based budgeting

approach predicted by the tools provide concrete data for library managers to shape their medium- and long-term strategic plans.

Another important contribution of the research is that it indicates the extent to which ethical considerations are reflected in AI-generated discourse. The fact that all tools seriously address issues such as algorithmic bias, data privacy, the digital divide, and transparency, and offer concrete management recommendations, adds an important perspective to discussions regarding the ethical use of AI in libraries. The fact that AI tools are aware of their own risks and suggest transparent data management, regular algorithm audits, and user approval mechanisms to mitigate these risks provides concrete guidance that libraries should consider when developing their AI policies. This finding demonstrates that responsible and ethical use of AI is possible, alleviating concerns among library personnel about the risks of surveillance and privacy violations.

However, the research also raises important questions for future work. First, it is necessary to monitor how AI-generated predictions evolve over time. This research represents the predictions of five AI tools as of 2025; however, given the constantly updated nature of these tools, longitudinal studies are important to reveal how AI's discourse on libraries changes. Second, it is necessary to determine which data sources the predictions of AI tools are based on. The content of AI tools' training datasets and potential biases within these sets directly affect the reliability and validity of predictions. Third, comparing AI tools' predictions with the perspectives of library professionals will help understand the balance between technological optimism and technological concern, while also revealing potential gaps between AI-reproduced consensus views and practitioners' on-the-ground insights. Fourth, how the hybrid model predicted by AI tools can be applied in different types of libraries (academic, public, private) and how it may vary by country and region should be investigated through comparative international studies. Fifth, how the personnel skills predicted by AI tools can be integrated into library and information science education programs should be detailed through curriculum development studies.

In conclusion, this research has revealed that AI's discourse on the future of libraries presents not only a technological narrative but also a comprehensive vision with social, ethical, and epistemological dimensions. The definition of libraries by AI tools as a 'balance between technological advancement and human-centred values' emphasises that libraries must not compromise their core values while rebuilding their identities in the digital age. The strengthening of libraries' role in democratising social knowledge in the second half of the 21st century depends on their critically evaluating the opportunities offered by AI and integrating them with an ethical and inclusive approach. This research has demonstrated the value of listening to AI's own voice in charting the roadmap for this integration and has provided a unique and empirically grounded contribution to discussions about the future of libraries. The findings provide a data-driven foundation for shaping the strategic decisions of library administrators, the curriculum development efforts of educators, and the regulatory frameworks of policymakers.

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