INVERGE JOURNAL OF SOCIAL SCIENCES
https://invergejournals.com/
ISSN (Online): 2959-4359, ISSN (Print): 3007-2018
Volume 5 Issue 6, 2026

TOOL, PARTNER, OR AGENT? ARTIFICIAL GENERAL INTELLIGENCE (AGI) AND THE FUTURE OF LIBRARIES: A REVIEW AND CONCEPTUAL ANALYSIS

Muhammad Kabir Khan[1]

DOI: https://doi.org/10.63544/ijss.v5i6.347

Affiliations:

[1] Effat Library & Cultural Museum, Effat University, Jeddah, Kingdom of Saudi Arabia
[1] Faculty of Management (FOM), Multimedia University, Cyberjaya, Malaysia

Email: mkabir@effatuniversity.edu.sa

Corresponding Author's Email:

[1] mkabir@effatuniversity.edu.sa

Copyright:

Author/s

License:

open access

Article History:
Received: 21.10.2026
Accepted: 14.11.2026
Published: 28.11.2026

Abstract

Purpose: *Libraries have moved from card catalogues to chatbots in a single working lifetime. Generative and agentic AI now push them further, towards systems that plan, act and learn with growing autonomy. This paper asks what the possible arrival of artificial general intelligence (AGI) would mean for library services, librarians and governance, and how libraries can prepare without waiting for certainty.*

Design/methodology/approach: *An integrative conceptual review synthesises recent scholarship on AI, generative AI and agentic AI in libraries, together with foundational AGI literature, professional standards and policy instruments. Thematic synthesis is used to build four original frameworks.*

Findings: *The paper positions libraries on an evolution map from automation to AGI, proposes a seven-pillar model of the AGI-enabled library, a human-in-the-loop operating cycle, and an autonomy-delegation matrix that shows which tasks can be handed to machines and which must stay human-led. A phased roadmap and research agenda follow.*

Originality/value: *Few studies look beyond agentic AI to AGI. The frameworks give library leaders, LIS educators and policymakers a shared vocabulary for planning, and show that the decisive variable is not the technology but the quality of human stewardship around it.*

Keywords: Artificial General Intelligence, Agentic AI, Generative AI, Academic Libraries, AI Literacy, Human-in-the-Loop, Library Services, AI Governance

1. Introduction

Every generation of librarians has been told that a new technology would make them obsolete. The card catalogue gave way to the online public access catalogue, the reference desk competed with search engines, and print collections were joined by digital libraries, discovery layers and institutional repositories. Each time, libraries survived by absorbing the technology and redefining their value around it (Cox et al., 2019; Massis, 2018). Artificial intelligence (AI) is the latest and most far-reaching of these shifts. It is already used for virtual reference, metadata generation, recommendation, resource discovery, research support and user education (Gupta, 2025; Makinde et al., 2025).

The pace has quickened sharply. Clarivate's 2025 *Pulse of the Library* survey of more than 2,000 librarians in 109 countries found that 67% of libraries were exploring or implementing AI tools, up from 63% a year earlier, and that budget had overtaken lack of expertise as the main barrier to adoption (Clarivate, 2025). In October 2025 the Association of College and Research Libraries (ACRL) approved the first library-specific *AI Competencies for Academic Library Workers*, noting that AI is being built into library software and discovery platforms, often without consultation with library staff (Association of College and Research Libraries [ACRL], 2025). AI is no longer a pilot project at the margins of library work; it is becoming part of the infrastructure.

Generative AI widened the role of libraries in teaching, learning and research, through summarisation,

writing support, information literacy instruction and research assistance (Gmiterek & Kotuła, 2025; Narayanan, 2024; Sultan & Uddin, 2025). A newer wave of *agentic* AI goes further. Agentic systems can plan multi-step tasks, call external tools and act with reduced human supervision. Wang and Chou (2025) showed that agentic AI can improve the accuracy and efficiency of academic library responses to student queries, and recent reviews map a growing set of agentic use cases in library settings (Ayinde et al., 2026b; Shahzad et al., 2026).

Artificial general intelligence (AGI) lies beyond these developments. AGI refers to systems able to reason, learn and solve problems across many domains at or above human level, rather than excelling at one narrow task (Goertzel, 2014; Morris et al., 2024). AGI does not yet exist, and experts disagree about when, or whether, it will. Yet the direction of travel matters now. Wu (2024) argues that the prospect of AGI is already reshaping the competencies, education and roles expected of information professionals. Libraries that wait for AGI to arrive before thinking about it will repeat the mistake of institutions that waited for the web to mature before building digital services.

This paper therefore asks a forward-looking question: *what would the transition from today's AI to AGI mean for library services, librarians and library governance, and what should libraries do now?* It makes four contributions. First, it places current library technologies on an evolution map that runs from automation to AGI. Second, it proposes a seven-pillar model of the AGI-enabled library. Third, it offers a human-in-the-loop operating cycle and an autonomy-delegation matrix that show where machine autonomy is appropriate and where human accountability must remain. Fourth, it sets out a phased roadmap and a research agenda.

1.1 Objectives

1. To review current applications of AI, generative AI and agentic AI in libraries as the foundation for understanding the transition towards AGI.
2. To identify the potential roles of AGI in library operations, user services, research support, knowledge discovery and decision-making.
3. To analyse the opportunities AGI offers for automation, personalisation, intelligent assistance and service quality.
4. To examine the ethical, legal, professional and organisational challenges of AGI adoption in libraries.
5. To assess the competencies, AI literacy and institutional readiness that librarians and information professionals will need.
6. To propose strategic recommendations and future research directions for the responsible integration of AGI in libraries and information services.

The rest of the paper is organised as follows. Section 2 clarifies what AGI means and how it differs from earlier forms of AI. Section 3 explains the method. Section 4 reviews the literature on AI in libraries and traces the path towards AGI. Section 5 presents the seven-pillar model, and Section 6 the operating cycle and delegation matrix. Sections 7 to 9 discuss benefits, challenges and changing professional roles. Section 10 sets out a roadmap and recommendations, Section 11 a research agenda, and Section 12 concludes.

2. Conceptual Background: What Do We Mean by AGI?

The term *artificial general intelligence* was popularised in the early 2000s to distinguish systems with broad, flexible intelligence from the specialised programs that dominated AI research (Goertzel & Pennachin, 2007). Legg and Hutter (2007) defined machine intelligence as an agent's ability to achieve goals across a wide range of environments, a definition that puts *generality* at the centre. Standard textbooks draw a similar line between narrow systems designed for a single task and general systems that transfer learning across tasks (Russell & Norvig, 2021).

The arrival of large language models reopened the debate. Bubeck et al. (2023) argued that GPT-4 showed early "sparks" of general intelligence, while critics pointed to its unreliable reasoning and lack of grounded understanding. To move the discussion beyond yes-or-no claims, Morris et al. (2024) proposed *levels of AGI* defined along two axes, depth (performance) and breadth (generality), and paired them with six levels of autonomy, from AI as a tool to AI as a fully independent agent. This framing is useful for libraries because it treats AGI not as a single event but as a gradient along which services can be located and governed.

INVERGE JOURNAL OF SOCIAL SCIENCES
https://invergejournals.com/
ISSN (Online): 2959-4359, ISSN (Print): 3007-2018
Volume 5 Issue 6, 2026

Table 1 summarises how four paradigms differ in capability, autonomy and implications for library work. The boundaries are not sharp; agentic systems are built on generative models, and an AGI would probably include agentic capabilities. The table should be read as a set of ideal types rather than a strict taxonomy.

Table 1

Four Paradigms of Intelligent Systems and What They Mean for Libraries

Dimension	Narrow AI	Generative AI	Agentic AI	AGI (projected)
Core capability	Recognises patterns and predicts within one task	Produces new text, images, code and summaries	Plans, uses tools and completes multi-step goals	Reasons, learns and transfers knowledge across domains
Scope	Single, well-defined task	Many tasks within language and media	Workflows that span several systems	Open-ended, any intellectual task
Autonomy	Low: runs when called	Low to moderate: responds to prompts	Moderate to high: acts towards goals	High: can set sub-goals and adapt
Library example	Recommender systems, OCR, plagiarism detection	AI research assistants, metadata drafts, guide writing	Agents that triage queries, check holdings and place requests	A research partner that designs, runs and critiques a review
Librarian's role	Operator	Curator and guide	Supervisor	Steward and partner
Main risk	Hidden bias in training data	Hallucinated facts and citations	Errors that compound across steps	Loss of human oversight and accountability

Note. Source: Authors' synthesis based on Russell and Norvig (2021), Morris et al. (2024) and the library literature reviewed in Section 4.

3. Methodology

Because AGI has not yet been deployed in any library, there is no empirical evidence about its use. The study therefore adopts an integrative conceptual review, a method suited to emerging topics where the aim is to synthesise diverse sources into new frameworks rather than to aggregate effect sizes (Jaakkola, 2020; Torraco, 2005). Primary data collection through surveys, interviews or experiments was not used.

The review drew on four bodies of material: (a) peer-reviewed studies of AI, generative AI and agentic AI in libraries; (b) foundational literature defining AGI and its levels; (c) professional standards and survey reports from library associations and industry; and (d) policy instruments on AI ethics and regulation. Sources were identified through Scopus, Web of Science, Google Scholar, Emerald Insight and LISTA, supplemented by backward and forward citation tracking. Search strings combined terms such as "artificial general intelligence", "agentic AI", "generative AI", "artificial intelligence" and "AI literacy" with "library", "librarian" and "information services". The review concentrated on literature published between 2018 and 2026, with earlier works included where they define core concepts. Items were included if they addressed AI applications, competencies, ethics or governance in library and information contexts, and excluded if they were purely technical with no service implications.

The retained literature was analysed using reflexive thematic synthesis (Braun & Clarke, 2006). Initial codes were grouped into seven themes: current AI uses, the generative-to-agentic transition, potential AGI applications, benefits, professional competencies, ethical and legal concerns, and organisational readiness. These themes were then used to develop four frameworks: an evolution map (Figure 1), a seven-pillar model (Figure 2), a human-in-the-loop cycle (Figure 3) and an autonomy-delegation matrix (Figure 4), followed by a roadmap (Figure 5). The frameworks are conceptual propositions intended to guide planning and future empirical testing, not validated models.

4. Literature Review: From Automation to the AGI Horizon

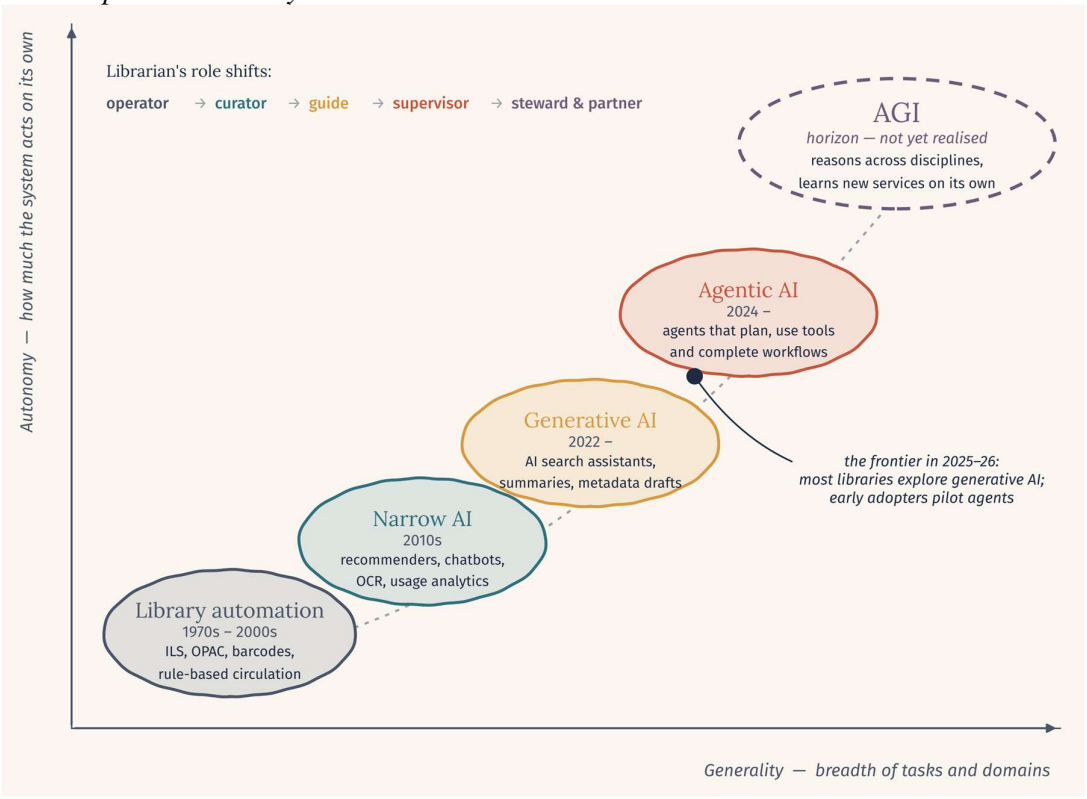
4.1 The Long Arc of the Intelligent Library

INVERGE JOURNAL OF SOCIAL SCIENCES
https://invergejournals.com/
ISSN (Online): 2959-4359, ISSN (Print): 3007-2018
Volume 5 Issue 6, 2026

Libraries have been automating for half a century. Integrated library systems, online catalogues and barcode circulation in the 1970s to 2000s replaced manual routines with rule-based software. The 2010s brought machine learning into recommendation, optical character recognition and usage analytics. Thought leaders interviewed by Cox et al. (2019) predicted that AI would affect search and discovery, scholarly communication and the shape of library work itself, and Okunlaya et al. (2022) proposed a conceptual framework placing AI library services at the heart of digital transformation in universities. Figure 1 places these stages on two axes, generality and autonomy, and shows how the librarian's role has moved from operator towards steward as systems become broader and more independent.

Figure 1

The Evolution Map: From Library Automation to the AGI Horizon



Note. Each stage widens the range of tasks a system can handle and increases how far it can act on its own. Source: Authors' own work

4.2 Current Applications of AI in Libraries

In libraries, AI usually means task-specific technologies that automate or enhance particular services: chatbots, recommendation tools, automated cataloguing, plagiarism detection and analytics for decision-making (Ayinde et al., 2026a; Haris et al., 2025; Sardar et al., 2026). A systematic review by Ayinde et al. (2026a) grouped academic library AI applications into reference and information services, technical services, administration, circulation, collection development, information literacy and professional development, and found reference and information services to be the most prominent area. Topic modelling of recent research confirms a similar spread, with clusters around chatbots, information retrieval, cataloguing and ethics (Masrek & Khan, 2025), while bibliometric work shows the rapid growth of research linking AI and digital literacy since 2011 (Saleem et al., 2026).

AI-powered chatbots answer frequently asked questions, guide users to resources and offer round-the-clock support (Makinde et al., 2025; Sardar et al., 2026). AI-based discovery tools improve search relevance and personalise recommendations; Zhang et al. (2025) showed how generative AI-driven discovery, guided by a dynamic evaluation model, can optimise public library services. In research support, AI assists with literature searching, citation management, systematic reviews and research data services. User surveys suggest

that acceptance is high where tools are reliable and clearly explained, and lower where users worry about accuracy and privacy (Haris et al., 2025; Oladokun et al., 2026). These findings indicate that AI is not only a technical tool but a mechanism of service innovation.

4.3 Generative and Agentic AI: the Bridge to AGI

Generative AI extends earlier systems by producing new content: text, summaries, explanations, research documents and learning materials. Narayanan (2024) describes how generative AI is transforming academic libraries, education and research by enabling new forms of knowledge creation and user engagement. Dwivedi et al. (2023), in a widely cited multidisciplinary review, highlighted both the productivity gains and the threats to academic integrity, authorship and information quality that conversational AI brings. Sultan and Uddin (2025) report that generative AI can improve student learning outcomes in library contexts while raising ethical dilemmas, and Gmiterek and Kotuła (2025) document how Polish university libraries have begun to embed generative AI in their services.

Agentic AI is a more advanced stage because it can carry out autonomous tasks, plan actions, interact with tools and respond to needs with less human intervention. Studies argue that agentic AI matters most for reference services, personalised assistance and automated user support (Ayinde et al., 2026b; Oladokun, 2026; Wang & Chou, 2025). Narayanan (2025) describes autonomous AI agents as moving libraries "beyond chatbots" towards systems that complete whole workflows. A systematic review by Shahzad et al. (2026) maps the prospects and challenges of agentic AI in library settings, and Akin-Fakorede et al. (2026) link agentic solutions to the human-centred vision of Industry 5.0, calling for clear policy and strategic planning. Agentic AI is therefore the bridge between today's tools and a possible AGI future: it is the first generation of library technology that acts, not merely answers.

4.4 What Changes When Intelligence Becomes General

Current AI systems are powerful but bounded. They perform specific tasks based on training data and predefined models, and they fail in ways that are often hard to predict. AGI, by contrast, would be capable of broader understanding, reasoning and autonomous learning. This could allow library systems to move from automation towards adaptive decision-making and genuine knowledge partnership. Such a system might understand a user's academic background, research interests, learning style and information needs; recommend books, articles, databases, methods and potential collaborators; identify research gaps; design literature review strategies; and evaluate the credibility of sources.

To make this concrete, consider an illustrative scenario. A doctoral student in public health opens the library portal at midnight and asks for help scoping a review on heat stress among outdoor workers in the Gulf. An AGI-enabled library assistant clarifies her question, drafts a search strategy across five databases, notes that most studies are in English and suggests Arabic-language grey literature, flags two retracted papers, and proposes a PRISMA-compliant protocol. It then books her a consultation with the health sciences librarian, who checks the strategy, adds a regional database the system missed and discusses whether the protocol should be registered. The machine handles scale and speed; the librarian brings judgement, context and accountability. This division of labour, rather than replacement, is the most plausible and most desirable future.

AGI should therefore be understood as a means of strengthening human–AI collaboration, not as a substitute for librarians. Cox (2026) stresses the value of information professional competencies within the agentic AI loop: librarians guide, evaluate and ethically manage intelligent systems. The future library will depend on advanced technologies such as blockchain, the Internet of Things and AI (Khan & Lokman, 2026; Khan, 2025), combined with professional judgement. AGI-powered systems could also support multilingual communication, accessibility for visually impaired users and immersive learning in virtual reality and metaverse environments (Khan et al., 2025; Sardar & Khan, 2026).

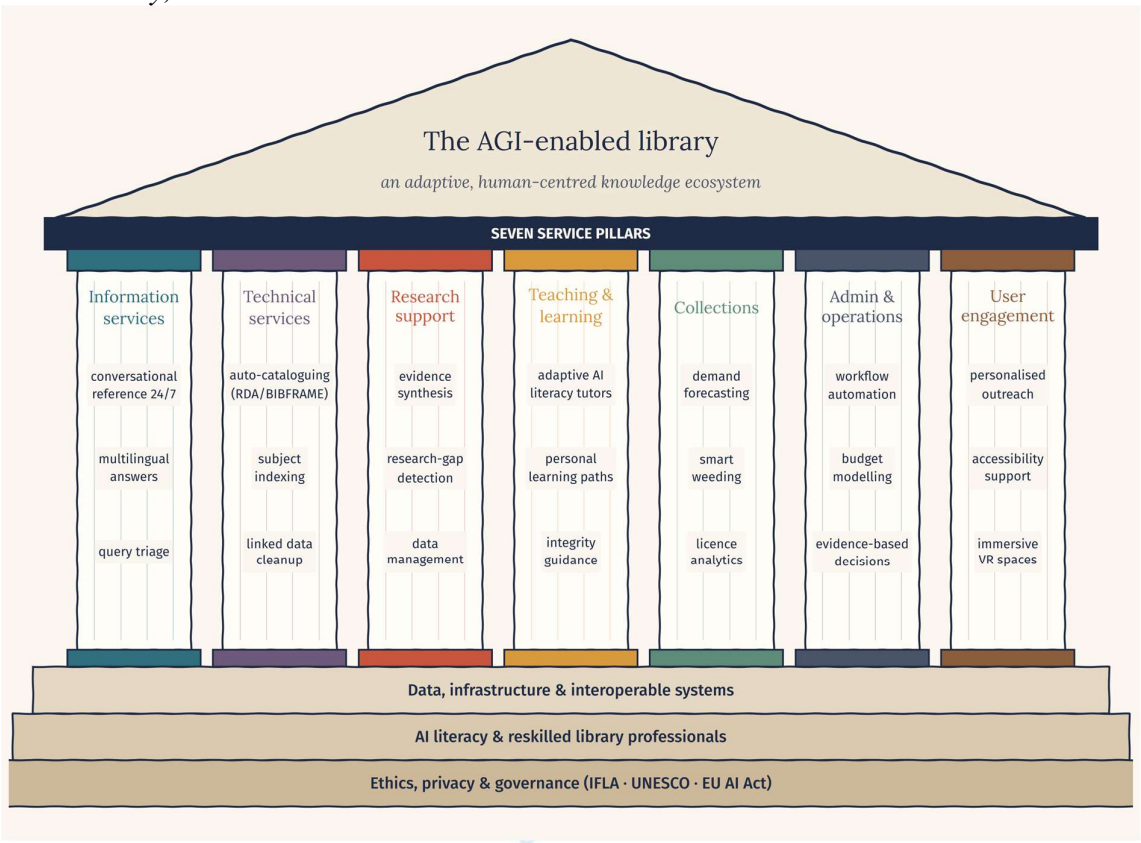
5. The Seven Pillars of the AGI-Enabled Library

Synthesising the literature, this paper proposes that AGI could reshape library work across seven service pillars, resting on three foundations (Figure 2). The image of a classical library façade is deliberate: the pillars carry the weight of services, but they stand only as firmly as the foundations beneath them.

INVERGE JOURNAL OF SOCIAL SCIENCES
https://invergejournals.com/
ISSN (Online): 2959-4359, ISSN (Print): 3007-2018
Volume 5 Issue 6, 2026

Figure 2

The Seven Pillars of the AGI-enabled Library, Resting on Foundations of Data and Infrastructure, Professional AI Literacy, and Ethics and Governance



Note. Source: Authors' own work

5.1 Information Services

Conversational reference available around the clock, in many languages, able to triage routine queries and escalate complex ones to human specialists.

5.2 Technical Services

Automated cataloguing and classification in RDA and BIBFRAME, subject indexing, authority control and linked-data clean-up, with librarians validating quality and resolving edge cases.

5.3 Research Support

Evidence synthesis, bibliometric analysis, research-gap detection, data management planning and citation checking, extending what libraries can offer to researchers at every career stage.

5.4 Teaching and Learning

Adaptive tutors for information and AI literacy, personalised learning paths and guidance on the ethical use of AI in coursework, an area in which libraries already lead on many campuses (Khan et al., 2026).

5.5 Collections

Forecasting demand, analysing usage, guiding weeding decisions and modelling licence value, drawing on decision-support principles long established in management information systems (Asemi et al., 2011).

5.6 Administration and Operations

Workflow automation, staffing and budget modelling, performance reporting and evidence-based strategic decisions.

5.7 User Engagement

Personalised outreach, accessibility support for users with disabilities, and immersive spaces that extend the library beyond its walls.

INVERGE JOURNAL OF SOCIAL SCIENCES
https://invergejournals.com/
ISSN (Online): 2959-4359, ISSN (Print): 3007-2018
Volume 5 Issue 6, 2026

The three foundations are equally important. Data, infrastructure and interoperable systems determine what an intelligent system can see and do. AI literacy and reskilled professionals determine whether staff can direct, evaluate and correct it. Ethics, privacy and governance, informed by instruments such as the statement on libraries and AI issued by the International Federation of Library Associations and Institutions (IFLA, 2020), the UNESCO (2021) Recommendation on the Ethics of AI and the European Union's AI Act (European Union, 2024), determine whether its use is legitimate. A library that builds pillars without foundations will find that its services are fragile.

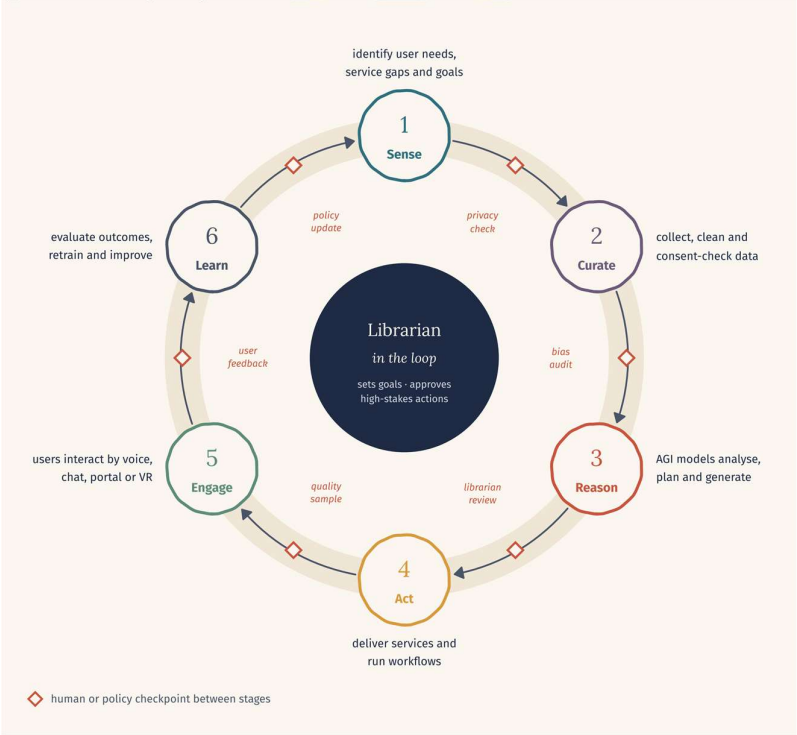
6. Operating Model: Keeping the Librarian in the Loop

6.1 A Human-in-the-loop Service Cycle

AGI-enabled services will not be a one-off installation but a continuous cycle. Figure 3 presents six stages: sensing user needs and service gaps; curating data with attention to consent and quality; reasoning, in which AI models analyse, plan and generate; acting, in which services are delivered and workflows run; engaging, in which users interact through voice, chat, portals or immersive spaces; and learning, in which outcomes are evaluated and the system improved. The distinctive feature of this model is the set of checkpoints between stages: privacy checks, bias audits, librarian review, quality sampling, user feedback and policy updates. At the centre sits the librarian, who sets goals and approves high-stakes actions. The model reflects the principle that the more autonomous a system becomes, the more deliberately human oversight must be designed in (Cox, 2026; Morris et al., 2024).

Figure 3

The Human-in-the-loop Service Cycle for AGI-enabled Libraries



Note. Diamonds mark human or policy checkpoints between stages. Source: Authors' own work

6.2 Who Does What? An Autonomy-delegation Matrix

Not every task should be delegated to the same degree. Figure 4 maps ten representative library tasks against the six autonomy levels proposed by Morris et al. (2024), from no AI, through AI as a tool, consultant, collaborator and expert, to AI as an autonomous agent. Routine, high-volume and easily verified tasks, such as answering directional queries or copy cataloguing, move quickly towards high autonomy. Tasks that involve values, accountability or legal exposure, such as privacy decisions, policy-making and budgeting, remain at low autonomy even in an AGI scenario. The matrix is a conceptual estimate rather than an empirical measurement, but it gives libraries a practical tool: before deploying any intelligent system, a library can ask

INVERGE JOURNAL OF SOCIAL SCIENCES
https://invergejournals.com/
ISSN (Online): 2959-4359, ISSN (Print): 3007-2018
Volume 5 Issue 6, 2026

which cell a task belongs in and what checkpoint is required.

Figure 4

Autonomy-delegation Matrix: How Far Ten Library Tasks Could Be Handed to Intelligent Systems in Each Paradigm



Note. Hatched cells are projections. Source: Authors' conceptual mapping, adapted from the autonomy levels of Morris et al., 2024

7. Benefits of AGI for Libraries

7.1 Personalised User Experience

Instead of returning the same results to every user, AGI-based systems could adapt to each user's needs, academic level, discipline and purpose, acting as a patient, always-available guide.

7.2 Research Productivity

AGI could support systematic reviews, bibliometric analysis, proposal development, citation checking and scholarly communication. This would allow librarians to offer more advanced research partnership rather than transactional help.

7.3 Accessibility and Inclusion

Multilingual support, voice assistance, plain-language explanations and adaptive interfaces could open library services to users with disabilities and to communities who do not read the dominant language of the collection. Enakpowoke and Joshua (2026) show that such benefits depend on careful planning and adequate infrastructure.

7.4 Evidence-based Management

By analysing usage data, predicting collection needs and identifying service gaps, AGI could strengthen strategic decisions. Gupta (2025) cautions, however, that adoption must be driven by strategy rather than hype.

7.5 Freeing Professional Time

Clarivate (2025) found that libraries see efficiency as a way to release staff for strategic and creative work. If routine tasks are absorbed by machines, librarians can invest more in teaching, community engagement and research partnership, the parts of the job that most depend on human relationships.

INVERGE JOURNAL OF SOCIAL SCIENCES
https://invergejournals.com/
ISSN (Online): 2959-4359, ISSN (Print): 3007-2018
Volume 5 Issue 6, 2026

8. Ethical, Legal and Organisational Challenges

The promise of AGI is matched by serious risks. Floridi and Cowls (2019) propose five principles for AI in society: beneficence, non-maleficence, autonomy, justice and explicability. Each maps directly onto library values of intellectual freedom, privacy and equitable access. Panda et al. (2024) argue that "ethical intelligence" must guide AI integration in libraries, and Sultan and Uddin (2025) identify ethics as a central issue in generative AI adoption. Table 2 summarises the main challenges, how they could play out and what libraries can do about them.

Table 2

Key Challenges of AGI Adoption in Libraries and Possible Responses

Challenge	What could go wrong	Possible library response
Privacy and surveillance	Personalisation requires detailed data on what users read and ask, creating profiles that could be misused	Data minimisation, clear consent, local processing where possible, and contracts that forbid vendors from reusing patron data
Bias and misinformation	Systems reproduce bias in training data or invent plausible but false facts and citations	Regular bias audits, source-grounded answers, visible citations and user-reporting channels
Transparency and explicability	Users cannot see why a resource was recommended or a query answered in a certain way	Explainable interfaces, plain-language notices that AI is in use, published algorithmic policies
Copyright and licensing	Training or retrieval may breach licence terms or authors' rights	Licence reviews, rights-aware retrieval, and advocacy for fair text-and-data-mining terms
Digital divide	Well-funded libraries pull ahead while others lack infrastructure, budgets and skills	Consortial procurement, open-source tools, shared regional infrastructure and targeted training
Workforce change and deskilling	Staff fear replacement, or lose core skills by over-relying on machines	Reskilling plans, new role descriptions, and keeping humans in critical judgement tasks
Vendor lock-in and cost	Proprietary platforms limit choice and raise long-term costs	Open standards, data portability clauses and exit strategies in contracts
Environmental footprint	Large models consume significant energy and water	Prefer efficient models, report AI use in sustainability plans, avoid unnecessary deployments
Accountability and regulation	It is unclear who is responsible when an autonomous system causes harm	Named human owners for each AI service, impact assessments, and alignment with laws such as the EU AI Act

Note. Source: Authors' synthesis drawing on Floridi and Cowls (2019), IFLA (2020), UNESCO (2021), European Union (2024), Panda et al. (2024) and Clarivate (2025).

Regulation is catching up. The EU AI Act entered into force in August 2024 and introduces risk-based obligations for AI systems and specific duties for providers of general-purpose AI models, which apply in stages from 2025 (European Union, 2024). Libraries outside Europe will feel its effects through the vendors they use. Organisational readiness is an equally important constraint. Makinde et al. (2025) and Enakpowoke and Joshua (2026) show that successful integration depends on staff training, institutional readiness and clear strategies, and Clarivate (2025) found that libraries with formal AI literacy training were more likely to have moved into active implementation.

Job displacement is a recurring fear. The evidence suggests, however, that AI is more likely to transform library roles than to eliminate them. Appedu and Tacheva (2025) show that librarians' understanding

INVERGE JOURNAL OF SOCIAL SCIENCES
https://invergejournals.com/
ISSN (Online): 2959-4359, ISSN (Print): 3007-2018
Volume 5 Issue 6, 2026

of AI agency is nuanced and shaped by professional discourse, rather than a simple story of human versus machine. Libraries should therefore invest in reskilling, upskilling and the redesign of roles instead of treating AI as a direct threat.

9. Emerging Roles and Competencies of Librarians

The rise of AGI will require new skills and new professional identities. Future librarians will need competencies in AI literacy, data literacy, prompt design, ethical AI governance, digital scholarship, research analytics and human–AI collaboration (Khan & Ullah, 2024; Khan et al., 2026). The ACRL (2025) competency framework organises these into four areas: ethical considerations, knowledge and understanding, analysis and evaluation, and use and application. Importantly, it states that library workers should retain the ability to decide whether to adopt a given AI technology at all, based on ethics, performance, context and professional values. Cox (2026) similarly argues that information professionals remain essential in the agentic AI loop because of their expertise in information evaluation, user support, ethics and knowledge organisation. Librarians must therefore learn not only how to use AI but how to question and govern it. Table 3 outlines roles that are likely to emerge.

Table 3

Emerging Library Roles in the AGI Era

Emerging role	Core responsibilities	Key competencies
AI literacy specialist	Teaches users and staff to use, evaluate and question AI tools	Pedagogy, critical evaluation, ACRL AI competencies
AI services and agent coordinator	Configures, monitors and improves library AI agents and chatbots	Workflow design, prompt design, quality assurance
Algorithmic auditor / AI ethics lead	Runs bias, privacy and accuracy audits; maintains AI policies	Ethics frameworks, data protection law, audit methods
Knowledge graph and metadata engineer	Builds the linked data and metadata that intelligent systems rely on	RDA, BIBFRAME, linked data, data quality
Research intelligence librarian	Partners with researchers on evidence synthesis and analytics	Systematic review methods, bibliometrics, research data management
Human–AI experience designer	Designs services where people and machines work together smoothly	User research, accessibility, service design

Note. Source: Authors' synthesis based on Khan and Ullah (2024), ACRL (2025), Narayanan (2025), Cox (2026), Khan et al. (2026) and Oladokun (2026).

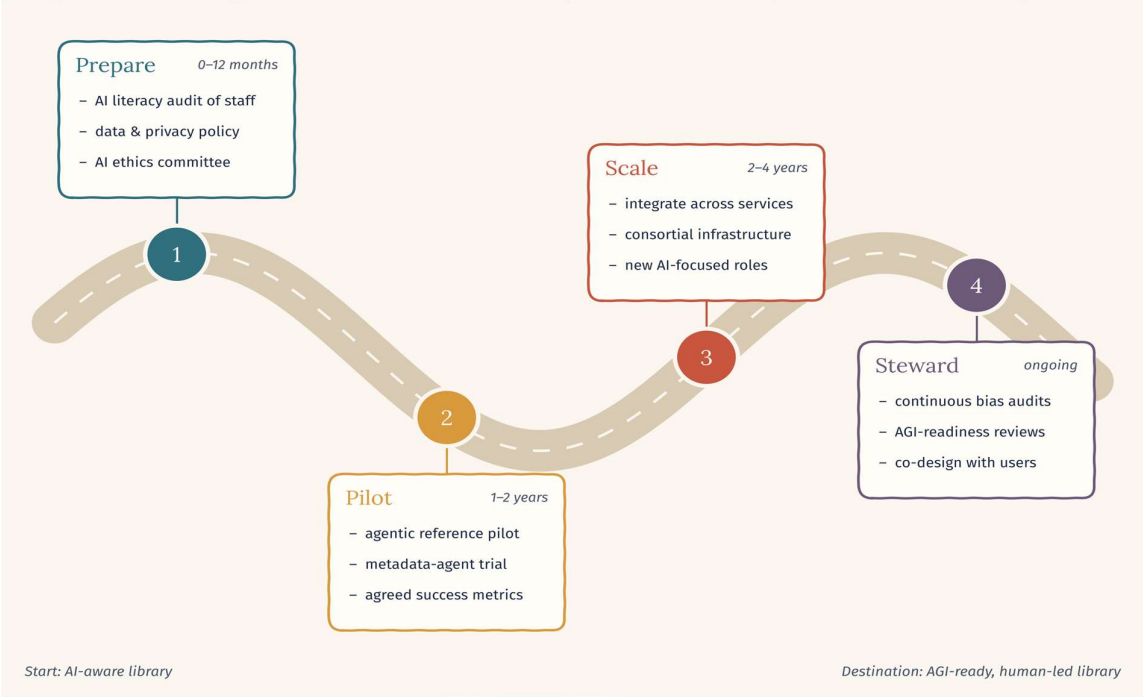
10. A Strategic Roadmap and Recommendations

AGI is uncertain, but preparation is not. Figure 5 proposes a four-phase roadmap that libraries can begin today, whatever the eventual pace of AGI development. The phases overlap and the timings are indicative; a well-resourced library may move faster, while others may spend longer building foundations.

INVERGE JOURNAL OF SOCIAL SCIENCES
https://invergejournals.com/
ISSN (Online): 2959-4359, ISSN (Print): 3007-2018
Volume 5 Issue 6, 2026

Figure 5

A Four-phase Roadmap From an AI-aware Library to an AGI-ready, Human-led Library



Note. Source: Authors' own work

10.1 For Library Leaders

- Write an AI strategy that is tied to the library's mission, not to vendor roadmaps, and review it every year.
- Start with low-risk, high-volume pilots, define success measures in advance and publish what was learned.
- Appoint a named owner for every AI-enabled service and require an impact assessment before deployment.

10.2 For LIS Educators and Professional Associations

- Embed AI literacy, data science and AI ethics in LIS curricula, using frameworks such as the ACRL (2025) competencies.
- Offer continuing professional development for mid-career staff, who are most exposed to role change.

10.3 For Policymakers, Consortia and Vendors

- Fund shared infrastructure so that smaller libraries in developing regions are not left behind.
- Build privacy, transparency and data portability into products by design, and involve librarians in product governance.

11. Future Research Agenda

Because AGI is still emerging, empirical research is urgently needed to test the frameworks proposed here and to ground future decisions in evidence. Table 4 outlines priority themes, illustrative questions and suitable theories and methods. Studies from the Global South are particularly needed, since most current evidence comes from North America, Europe and East Asia (Clarivate, 2025; Oladokun et al., 2026).

INVERGE JOURNAL OF SOCIAL SCIENCES
https://invergejournals.com/
ISSN (Online): 2959-4359, ISSN (Print): 3007-2018
Volume 5 Issue 6, 2026

Table 4

A Research Agenda for AGI in Libraries

Theme	Illustrative research questions	Suggested theories and methods
Readiness	How ready are libraries in terms of infrastructure, policy, skills and culture? What predicts readiness?	Technology Readiness Index, TOE framework; national surveys, PLS-SEM
User acceptance and trust	How do students and researchers perceive agentic and AGI-like services? When do they trust or reject them?	UTAUT2, Diffusion of Innovation; mixed methods
Human–AI collaboration	How should tasks be shared between librarians and intelligent systems? Does the delegation matrix hold in practice?	Socio-technical systems theory; case studies, design-based research
Ethics and governance	Which governance models best protect privacy, fairness and accountability?	Value-sensitive design; policy analysis, Delphi studies
Professional identity	How do librarians' roles, skills and identities change as autonomy increases?	Role theory; longitudinal interviews, ethnography
Impact and value	Do AI-enabled services improve learning, research output and equity of access?	Impact evaluation; quasi-experiments, learning analytics

Note. Source: Authors' own work

12. Conclusion

The move from AI to AGI marks a turning point in the evolution of libraries and information services. AI is already transforming library operations through automation, reference support, resource discovery and research assistance. Generative and agentic AI extend these possibilities by creating content, executing tasks autonomously and supporting users at scale. AGI, if and when it arrives, could turn libraries into adaptive, intelligent and human-centred knowledge ecosystems.

This paper has argued that the decisive question is not whether machines will become more capable, but whether libraries will shape how that capability is used. The evolution map shows that libraries are already well along the path. The seven-pillar model shows where change will be felt and what foundations it needs. The human-in-the-loop cycle and the delegation matrix show how autonomy can grow without accountability shrinking. The roadmap and research agenda show what can be done now.

Librarians will remain central to this transformation, but their roles will shift towards AI literacy, ethical guidance, digital scholarship, research partnership and the stewardship of human–AI collaboration. The future of libraries will not be defined by technology alone, but by how wisely librarians use intelligent systems to advance knowledge, inclusion and learning.

12.1 Limitations

As a conceptual review, this study does not present primary data, and its frameworks reflect the authors' interpretation of a rapidly changing literature. The delegation matrix and roadmap timings are indicative estimates rather than measurements. Predictions about AGI are inherently uncertain. Future empirical work should test, refine or challenge the propositions offered here.

Conflict of Interest Statement

The authors declare no conflicts of interest.

Funding Statement

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Informed Consent

Informed consent was obtained from all individual participants included in the study.

Ethical Approval

All procedures performed in studies involving human participants were in accordance with the ethical

standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Data Availability

The datasets generated during and analysed during the current study are available from the corresponding author on reasonable request.

References

Akin-Fakorede, O. O., Ajani, Y. A., Adigun, O. M., & Malik, F. O. (2026). Agentic AI solution and the promise of Industry 5.0 in the library sector: Policy implications and strategic considerations. *Business Information Review, 43*(1), 20–25.

Appedu, S., & Tacheva, J. (2025). Transcending binaries of agency through librarians' discursive constructions of AI. *Library Trends, 73*(3), 116–140.

Asemi, A., Safari, A., & Zavareh, A. A. (2011). The role of management information system (MIS) and decision support system (DSS) for manager's decision-making process. *International Journal of Business and Management, 6*(7), 164–173.

Association of College and Research Libraries. (2025). *AI competencies for academic library workers*. American Library Association. https://www.ala.org/acrl/standards/ai

Ayinde, L., Ebiefung, R., & Oladokun, B. D. (2026a). Adoption of artificial intelligence in academic libraries: A systematic review of current practices, challenges, and research opportunities. *The Journal of Academic Librarianship, 52*(1), 103185.

Ayinde, L., Ebiefung, R., & Oladokun, B. D. (2026b). Agentic artificial intelligence in libraries: Implications for academic libraries and future research. *Library Hi Tech News, 43*(3), 52–55.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Bubeck, S., Chandrasekaran, V., Eldan, R., Gehrke, J., Horvitz, E., Kamar, E., Lee, P., Lee, Y. T., Li, Y., Lundberg, S., Nori, H., Palangi, H., Ribeiro, M. T., & Zhang, Y. (2023). *Sparks of artificial general intelligence: Early experiments with GPT-4* (arXiv:2303.12712). arXiv. https://doi.org/10.48550/arXiv.2303.12712

Clarivate. (2025). *Pulse of the library 2025*. Clarivate. https://clarivate.com/pulse-of-the-library/report-2025/

Cox, A. (2026). Our place in the agentic AI loop: The value of information professional competencies. *Library Hi Tech News, 43*(2), 18–20.

Cox, A. M., Pinfield, S., & Rutter, S. (2019). The intelligent library: Thought leaders' views on the likely impact of artificial intelligence on academic libraries. *Library Hi Tech, 37*(3), 418–435.

Dwivedi, Y. K., Kshetri, N., Hughes, L., Slade, E. L., Jeyaraj, A., Kar, A. K., et al. (2023). "So what if ChatGPT wrote it?" Multidisciplinary perspectives on opportunities, challenges and implications of generative conversational AI for research, practice and policy. *International Journal of Information Management, 71*, 102642.

Enakpowoke, A. H., & Joshua, U. O. (2026). Integration of artificial intelligence (AI) in libraries: Challenges and prospects. *Bayero Journal of Library and Information Science, 6*(1), 117–129.

European Union. (2024). Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 June 2024 laying down harmonised rules on artificial intelligence (Artificial Intelligence Act). *Official Journal of the European Union*, L series, 12 July 2024.

Floridi, L., & Cowls, J. (2019). A unified framework of five principles for AI in society. *Harvard Data Science Review, 1*(1).

Gmiterek, G., & Kotuła, S. (2025). Generative artificial intelligence in the activities of academic libraries of public universities in Poland. *The Journal of Academic Librarianship*.

Goertzel, B. (2014). Artificial general intelligence: Concept, state of the art, and future prospects. *Journal of Artificial General Intelligence, 5*(1), 1–48.

Goertzel, B., & Pennachin, C. (Eds.). (2007). *Artificial general intelligence*. Springer.

Gupta, V. (2025). From hype to strategy: Navigating the reality of experimental strategic adoption of AI technologies in libraries. *Reference Services Review, 53*(1), 1–14. https://doi.org/10.1108/RSR-08-

2024-0042

Haris, M., Ansari, A. J., Malik, B. A., Lund, B. D., & Ali, N. (2025). Artificial intelligence in academic libraries: A survey of users' perception and adoption. *Global Knowledge, Memory and Communication*.

International Federation of Library Associations and Institutions. (2020). *IFLA statement on libraries and artificial intelligence*. IFLA.

Jaakkola, E. (2020). Designing conceptual articles: Four approaches. *AMS Review, 10*(1–2), 18–26. https://doi.org/10.1007/s13162-020-00161-0

Khan, M. K. (2025). Transforming libraries with blockchain technology: An overview of its potential implementation, benefits, and challenges. *Inverge Journal of Social Sciences, 4*(1), 75–86. https://doi.org/10.63544/ijss.v4i1.127

Khan, M. K., & Lokman, F. Z. B. A. (2026). Automation, transparency, and efficiency in library management through blockchain and IoT technologies. *Inverge Journal of Social Sciences, 5*(2), 12–26. https://doi.org/10.63544/ijss.v5i2.238

Khan, M. K., & Ullah, A. (2024). Assessing AI-powered library professionals: Implications for management in developing essential 21st-century skills. *AVE Trends in Intelligent Technoprise Letters, 1*(4), 184–195.

Khan, M. K., Amin, R., Ullah, A., & Ali, N. (2025). Digital transformation in libraries: Readiness of Pakistani university librarians for AR, VR, and metaverse. *AVE Trends in Intelligent Social Letters, 2*(2), 81–90. https://doi.org/10.64091/ATISL.2025.000193

Khan, M. K., Lokman, F. Z. B. A., & Masrek, M. N. (2026). AI literacy competencies among library professionals in Saudi Arabia: A cognitive, normative, and behavioural perspective. *Inverge Journal of Social Sciences, 5*(3), 16–34. https://doi.org/10.63544/ijss.v5i3.280

Legg, S., & Hutter, M. (2007). Universal intelligence: A definition of machine intelligence. *Minds and Machines, 17*(4), 391–444. https://doi.org/10.1007/s11023-007-9079-x

Makinde, O. B., Obia, S. E., Okoye, M., Gyang, S. V., & Makinde, B. O. (2025). Artificial intelligence and technology-enhanced information services in academic libraries: A literature review. *Informare: The Journal of the Department of Library and Information Science, 1*(2), 1–27.

Masrek, M. N., & Khan, M. K. (2025). Exploring AI applications in libraries: A topic modelling analysis of recent trends and themes. *Journal of Islamic, Social, Economics and Development, 10*(79), 894–906.

Massis, B. (2018). Artificial intelligence arrives in the library. *Information and Learning Science, 119*(7/8), 456–459.

Morris, M. R., Sohl-Dickstein, J., Fiedel, N., Warkentin, T., Dafoe, A., Faust, A., Farabet, C., & Legg, S. (2024). Position: Levels of AGI for operationalizing progress on the path to AGI. In *Proceedings of the 41st International Conference on Machine Learning* (PMLR Vol. 235, pp. 36308–36321).

Narayanan, N. (2024). The era of generative AI: Transforming academic libraries, education, and research. In *Empowering minds: Collaborative learning platform for teachers, librarians and researchers* (pp. 282–293).

Narayanan, N. (2025). *Beyond chatbots: The emergence of autonomous AI agents in libraries*.

Okunlaya, R. O., Syed Abdullah, N., & Alias, R. A. (2022). Artificial intelligence (AI) library services innovative conceptual framework for the digital transformation of university education. *Library Hi Tech, 40*(6), 1869–1892.

Oladokun, B. D. (2026). Agentic AI and the future of library services. *Library Hi Tech News*, 1–4.

Oladokun, B. D., Atuase, D., Tachie-Donkor, G., Mosweu, T. L., & Gaitanou, P. (2026). University libraries in the age of generative AI: Perceptions and usage among students in developing countries. *The Journal of Academic Librarianship, 52*(4), 103253.

Panda, S., Sharma, V., Sati, P. P., & Kaur, D. N. (2024). *Ensuring ethical intelligence: Guiding the integration of AI in modern libraries*. SSRN. https://ssrn.com/abstract=4980190

Russell, S., & Norvig, P. (2021). *Artificial intelligence: A modern approach* (4th ed.). Pearson.

Saleem, Q. U. A., Kabir Khan, M., Akbar, A., & Ali, N. (2026). The intersection of artificial intelligence and

digital literacy: A bibliometric analysis 2011–2024. *Serials Review*, 1–15. https://doi.org/10.1080/00987913.2026.2746611

Sardar, H., & Khan, M. K. (2026). Awareness, competence, and perceptions of augmented reality, virtual reality, and the metaverse among Pakistani university librarians. *Inverge Journal of Social Sciences, 5*(1), 54–72. https://doi.org/10.63544/ijss.v5i1.221

Sardar, H., Azam, A., Azam, M., & Ramzan, M. (2026). Adoption of AI chatbots among medical students: Integration of AI literacy and information literacy within the theory of planned behavior. *The Electronic Library*. Advance online publication. https://doi.org/10.1108/EL-10-2025-0435

Shahzad, K., Iqbal, A., Khan, M. K., & Mohamed, O. (2026). Agentic AI in library settings: A systematic literature review of prospects and challenges. *Journal of Electronic Resources Librarianship*, 1–24. https://doi.org/10.1080/1941126X.2026.2758104

Sultan, J. B., & Uddin, M. M. (2025). Impact of adapting generative AI in academic libraries: Student perceptions, learning outcomes, and ethical challenges. In *Reimagining librarianship: Forging the future with AI technologies* (p. 64).

Torraco, R. J. (2005). Writing integrative literature reviews: Guidelines and examples. *Human Resource Development Review, 4*(3), 356–367. https://doi.org/10.1177/1534484305278283

UNESCO. (2021). *Recommendation on the ethics of artificial intelligence*. United Nations Educational, Scientific and Cultural Organization.

Wang, N. C., & Chou, Y. C. (2025). Using agentic AI to enhance the quality of academic libraries' responses for student queries. *Proceedings of the Association for Information Science and Technology, 62*(1), 1714–1716.

Wu, Y. (2024). Future of information professions: Adapting to the AGI era. *Scientific and Technical Information Processing, 51*(3), 273–279.

Zhang, L., Wang, B., Jing, S., & Zhang, Q. (2025). Generative AI-driven resource discovery in public libraries: Service optimization based on a dynamic evaluation model. *Journal of Library & Information Science in Agriculture, 37*(5).