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# HARNESSING ARTIFICIAL INTELLIGENCE FOR LIBRARY CONSORTIUM BUILDING: A GLOBAL OVERVIEW THROUGH A SYSTEMATIC REVIEW

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**The aim of the article** is to study how Artificial Intelligence is harnessed for library consortium building through a global overview.

**Research methods.** This research employs a qualitative research approach, combining case study analysis and literature review to explore AI's role in library consortiums. The result captures the diverse and uneven state of AI integration in library consortiums globally, highlighting areas of progress and ongoing challenges. Countries and regions differ in their adoption of AI technologies for library consortium operations based on infrastructure, funding, and local priorities.

**Scientific novelty.** This study offers original perspectives into how AI can revolutionise library consortium operations by enhancing inclusivity, efficiency, and innovation. It provides practical recommendations for leveraging AI to optimise resource sharing, automate administrative tasks, and improve user engagement, contributing valuable knowledge to the global discourse on the future of library collaboration.

**Main conclusions.** The results reveal the transformative potential of AI across various facets of library consortium operations including Seamless integration of multilingual resources, enabling better resource sharing across linguistic barriers, and personalization of user experiences through AI-driven recommendations and content delivery thereby showcasing global applications and their effectiveness in overcoming specific challenges. The finding also provides a region-specific snapshot of challenges, highlighting how varying socio-economic, technological, and policy environments shape the adoption of AI in library consortiums. Region-specific case studies include Orbis Cascade Alliance in the United States, IISC Library Hub in the United Kingdom, and Canadian Research Knowledge Network (CRKN) among others. The implications of this study suggest that AI integration in library consortiums can significantly enhance service accessibility, operational efficiency, and resource management. Through automating tasks and offering personalised user experiences, AI can improve the inclusivity and effectiveness of libraries, shaping the future of collaborative knowledge-sharing and resource optimisation on a global scale. This study demonstrates that AI is rapidly reshaping the operational, strategic, and

collaborative landscape of library consortiums across the world. Evidence from different regions reveals that AI enhances significant consortium functions such as resource sharing, metadata management, user engagement, decision-making, digital preservation, and knowledge discovery in technologically advanced regions including North America, Europe, East Asia, and Australia.

*Keywords:* consortium building; resource sharing; Artificial Intelligence; library; qualitative method.

## INTRODUCTION

The fusion of library consortium building and artificial intelligence (AI) marks a transformative stage in the global development of libraries. Libraries have long served as hubs of knowledge transmission by facilitating access to information and fostering collaboration (Adigun et al., 2024). With rapid technological advancements, AI now expands these traditional roles by introducing innovative approaches to resource management, sharing, and accessibility. As a result, modern library consortia increasingly rely on AI to optimize operations, improve user experience, and strengthen cooperative strategies (Subaveerapandiyan, 2023).

Library consortiums are collaborative structures that enable institutions to share resources, negotiate better access conditions, and exchange knowledge efficiently (Bergstrom et al., 2024). These networks are critical in ensuring equitable access to information, especially in periods of shrinking budgets and exponential data growth. Integrating AI into consortium development enhances these collaborations by addressing longstanding challenges related to resource allocation, scalability, and service customization (Mallikarjuna, 2024). Tools such as machine learning, natural language processing, and predictive analytics create opportunities to refine collection development, automate processing tasks, and strengthen knowledge sharing (Mallikarjuna, 2024).

Globally, AI has moved from theory to practice in library consortia. AI-driven systems support automated cataloguing, intelligent metadata analysis, real-time usage monitoring, and strategic decision-making (Badmus et al., 2024). Platforms powered by AI provide seamless interlibrary lending, multilingual access, digital repository management, and real-time translation services (Akinyemi, 2024), improving efficiency and enhancing user experience. As information ecosystems grow increasingly complex, libraries face rising expectations for individualized services, multilingual access, and integration of vast digital collections (Chavan & Naikar, 2024). AI emerges as a strategic enabler for addressing these demands by automating workflows and supporting data-driven service delivery.

AI integration is also reshaping how consortiums engage with stakeholders. Through advanced analytics, consortiums can track usage patterns, detect emerging trends, and design responsive strategies aligned with institutional needs (Kamalov et al., 2023). In addition, real-time translation and adaptive interfaces promote inclusivity by reducing linguistic and technological barriers. AI's influence is seen globally, from advanced platforms in industrialized countries to cost-effective solutions in developing regions that enhance participation in international networks and facilitate access to shared resources (Manjunatha, 2023; Chen et al., 2024). AI tools also support digitization efforts, helping preserve cultural heritage and expand research opportunities.

Furthermore, AI plays a growing role in bridging digital divides. Through identification of gaps in resource availability and recommending targeted interventions, AI-driven

en systems support equitable access to information an important contribution to the United Nations Sustainable Development Goals, especially those linked to education and reduced inequalities (Ono et al., 2024). However, successful AI adoption requires attention to ethical concerns such as algorithmic bias, data privacy, and skill shortages among library workers (Hodonu-Wusu, 2025). In addition, the financial burden of AI tools can be prohibitive in low-resource settings, underscoring the need for global collaboration, capacity building, and ethical frameworks to guide implementation.

There are pros and cons of AI use in library consortium building. The integration of Artificial Intelligence into library consortium operations offers some significant advantages. AI enhances resource sharing by enabling smarter discovery systems, automated metadata generation, and improved interoperability across member libraries. It strengthens decision-making through predictive analytics that support collection development, budgeting, and user-demand forecasting. AI-powered tools also streamline administrative processes such as licensing, cataloguing, authentication, and digital preservation, thereby reducing human workload and improving efficiency. More so, AI improves user experience through personalised recommendations, multilingual search, and intelligent virtual assistance. However, AI use in library consortia also presents notable challenges. High implementation costs and infrastructure gaps may disadvantage smaller institutions, widening digital inequities. Ethical concerns such as data privacy, algorithmic bias, and transparency pose risks to user trust. Over-reliance on automated systems may erode professional skills, while limited AI literacy among consortium staff can hinder effective adoption. Furthermore, vendor dependence and proprietary systems may threaten long-term sustainability and interoperability. AI deployment within library consortia can significantly increase energy consumption, especially when relying on large-scale cloud computing and machine-learning infrastructures. This heightened energy demand raises environmental concerns, as it contributes to carbon emissions and may undermine sustainability goals that many libraries and academic institutions are committed to upholding.

Harnessing AI for library consortium building represents a global shift toward more efficient, inclusive, and responsive knowledge systems. Through overcoming traditional barriers and enhancing resource-sharing strategies, AI offers pathways for future-ready collaboration. This paper provides a systematic review of emerging trends, best practices, challenges, and global perspectives on AI integration in library consortia, offering insights to guide libraries navigating the digital age.

## **STATEMENT OF THE PROBLEM**

Libraries irrespective of their types are finding it more and more difficult to remain relevant to the users and effective in the quickly changing digital landscape (Oyelude, 2025). Library consortiums, which are intended to improve cooperation and resource sharing between institutions, frequently face challenges like ineffective resource distribution, intricate licensing contracts, and restricted access to a wide range of international resources (Lalthanmawii & Verma, 2016). These issues have been made worse by the growth of digital content and the growing need for real-time, tailored information. It would be an understatement to say that employing AI to create consortiums has several advantages. Regardless its enormous potential to solve these problems through process simplification, enhanced decision-making, and user experience personalisa-

tion, artificial intelligence (AI) has not been widely adopted in library consortiums. Many consortiums lack the financial resources, technical know-how, and infrastructure necessary to successfully incorporate AI technologies into their operations, especially those in developing nations. Ethical issues including algorithmic biases, diversity, and data privacy also continue to be major obstacles. Comprehensive studies that critically explore how AI is being deployed, its practical outcomes, and its long-term implications are still limited. Existing literature often provides fragmented perspectives, focusing on isolated tools or single-institution experiences rather than offering a broader, comparative, or evidence-based understanding of AI's influence at the consortium level. This gap makes it difficult to assess best practices, understand risks, evaluate cost-benefit dynamics, or develop robust policies for responsible AI integration. Consequently, there is an urgent need for systematic research that maps current trends, identifies emerging challenges, and guides library consortia in making informed decisions about adopting AI-driven solutions. This disparity emphasises the necessity of a worldwide perspective that examines the advantages, difficulties, and best practices related to harnessing AI for library consortium building. A global perspective is essential because library consortia across different regions adopt AI at varying levels of maturity, creating diverse models, challenges, and innovations that can enrich collective understanding and guide best practices. An examination of AI integration worldwide allows researchers to capture cross-cultural, infrastructural, and policy differences, enabling more comprehensive insights that support equitable, scalable, and context-sensitive consortium development.

### **OBJECTIVES OF THE STUDY**

The broad objective of the study was to study how artificial intelligence is harnessed for library consortium building through a global overview. The specific objectives of the study were to:

1. Examine the current state of Artificial Intelligence integration in library consortium operations globally.
2. Explore the potential benefits of AI in addressing challenges such as resource sharing, user engagement, and decision-making within library consortiums.
3. Define challenges to adopting AI in library consortiums, particularly in resource-constrained settings.
4. Identify case studies on AI integration in library consortium operations globally.

### **LITERATURE REVIEW**

#### **The Current State of AI Integration in Library Consortium Operations**

AI is increasingly transforming the operations of library consortiums, which rely on cooperative resource sharing, cost reduction, and enhanced user services. Adoption levels vary globally, reflecting differences in technological readiness, financial capacity, and infrastructure (Zondi et al., 2024; Kalbande et al., 2024a). AI applications such as automated cataloguing, metadata generation, and natural language processing (NLP) support uniform and accurate bibliographic records across member institutions. NLP-driven search tools also enhance information retrieval by eliminating language and terminology barriers. In more technologically advanced regions including the Unit-

ed States, the United Kingdom, and parts of Europe AI is deeply embedded in library networks. Initiatives such as OCLC demonstrate how AI enhances resource sharing and operational efficiency on a global scale. Machine learning tools in these contexts support trend analysis, demand forecasting, and personalized services. AI-powered chatbots and virtual assistants improve user support by offering round-the-clock assistance.

In contrast, adoption remains limited across many parts of Asia, Africa, and Latin America due to inadequate funding, poor digital infrastructure, unstable internet access, and limited access to expertise (World Bank Group, 2024; Osei, 2024). African national library networks exploring AI face recurring challenges such as inconsistent connectivity and limited access to digital resources. Ethical and practical challenges accompany AI integration. Data privacy concerns arise because consortiums manage large volumes of sensitive user information (Noh, 2017). Algorithmic bias also poses risks, potentially leading to inequitable access to resources (Vela et al., 2022). More so, substantial financial investment is required for AI hardware, software, maintenance, and skilled personnel (Shrivastav, 2022). Interoperability challenges also persist because member libraries often use disparate systems with incompatible standards (Kalbande et al., 2024b).

Emerging developments include predictive analytics for optimising collection development, blockchain technologies for secure data sharing, and decision-support systems for consortium governance. Global partnerships and funding initiatives are expected to support AI adoption in under-resourced regions. Despite progress, bridging ethical, technological, and infrastructural gaps remains necessary for the equitable global integration of AI in consortium operations.

### **Potential Benefits of AI in Resource Sharing, User Engagement, and Decision-Making**

AI offers powerful solutions to long-standing challenges in library consortiums. In resource sharing, machine learning algorithms analyze historical data, borrowing patterns, and demand trends to guide equitable distribution and reduce delays (Hickerson et al., 2022). AI-driven inventory management identifies underutilized resources and suggests redistribution strategies. NLP-enabled discovery systems integrate metadata from multiple libraries, improving access to consortium-wide collections (Supriyono et al., 2024; Adigun & Igboechesi, 2024; Chandrashekar & Mulimani, 2024). In user engagement, AI supports personalized recommendations by analyzing user preferences and behaviour. This personalisation enhances resource use and satisfaction. Chatbots and virtual assistants provide 24/7 support, reducing staff workload and improving access for remote or digitally inexperienced users. These tools automate routine tasks, allowing librarians to focus on more complex responsibilities.

AI also enhances decision-making. Consortium leaders make critical choices regarding budgeting, policy, and acquisition. AI-enabled analytics convert large datasets into actionable insights, ensuring decisions align with user needs and institutional priorities (Oso & Machuki, 2019; Shivaram, 2024). Predictive analytics helps determine subscription renewals, resource value, and emerging academic interests. Sentiment analysis tools help uncover user perceptions, supporting proactive service improvements (Perifanis & Kitsios, 2023). AI further supports accessibility and inclusion. Technologies such as adaptive interfaces, automated translation, and text-to-speech systems promote equitable access for users with disabilities and multilingual backgrounds

(United Nations Regional Information Centre for Western Europe, 2024). By facilitating global interoperability, AI strengthens international collaboration and expands access to diverse knowledge resources. Overall, AI improves efficiency, customization, and strategic planning in library consortiums, though ethical considerations and unequal access to technologies remain concerns (Wang & Aviles, 2023; Zuiderwijk et al., 2021).

### **Challenges to AI Adoption in Resource-Constrained Library Consortiums**

Regardless of its transformative potential, AI adoption in library consortiums especially in resource-constrained contexts faces significant technological, ethical, and infrastructural obstacles. Technologically, inadequate digital infrastructure, unreliable connectivity, outdated systems, and limited processing capacity hinder effective deployment (Sinha & Lee, 2024). Skill shortages also pose a major challenge: librarians are rarely trained in programming, machine learning, or data analytics (Cox & Mazumdar, 2024), and financial constraints limit access to training.

Ethical concerns include data privacy, security risks, algorithmic bias, and uncertainty about AI's impact on employment. AI systems rely on extensive user data, and in low-resource settings with weak cybersecurity frameworks, information is vulnerable to breaches (Noh, 2017). Biased algorithms can marginalize certain user groups by privileging dominant languages or subjects (Vella et al., 2022). Automation also raises fears of job displacement, potentially creating resistance among staff (Tiwari et al., 2024).

Infrastructural limitations further hinder adoption. High implementation costs from hardware to maintenance pose a major barrier for consortiums funded by limited government grants or membership fees (Rawindaran et al., 2023). Disaggregated management structures, inconsistent metadata standards, and varying degrees of digitization across member libraries create interoperability challenges (Wolniak & Stecuła, 2024). Low levels of digital literacy among users also limit the effective use of AI-driven systems. Cultural resistance to change and the global digital divide deepen these challenges. Staff may fear disruption or lack confidence in new technologies (Ekuma, 2024). Meanwhile, consortiums in wealthy regions advance rapidly, while those in poorer regions fall further behind, limiting participation in global knowledge networks. Overcoming these challenges requires investment in infrastructure, capacity building, ethical governance, and strategic change management. Without these interventions, AI's potential in enhancing global library consortium operations will remain unevenly realized.

## **RESEARCH METHODS**

The study looks at how artificial intelligence (AI) might improve inclusivity, productivity, and creativity in library consortium operations using a qualitative research methodology. The qualitative design was selected to enable a thorough investigation of practical practices, patterns, and ramifications, offering a sophisticated comprehension of how AI is influencing library partnerships around the world (Lim, 2025; Zhang et al., 2024; Harrison et al., 2020). A thorough assessment of pertinent literature is combined with case study analysis as part of the technique. Case studies were selected from various regions to capture diverse experiences and applications of AI in library consortiums, ensuring a comprehensive and global perspective. These cases highlight successful implementations, challenges encountered, and innovative approaches to integrating AI into library workflows. The literature review supplements the case study technique by combining findings from academic publications, conference papers, and industry reports (Kraus et al., 2022). This makes it easier to

spot new trends, best practices, and any holes in the body of current research. Furthermore, secondary data was collected from technical papers, policy documents, and library consortium websites in order to contextualise the results and assess their applicability to more general operational and strategic objectives. The study provides a comprehensive view of AI's revolutionary impact by combining case studies, literature, and secondary data. This approach guarantees richness and dependability while offering practical suggestions for libraries looking to successfully use AI. Case studies from the Global North were selected because these regions currently lead in the adoption, funding, and infrastructural readiness for AI-driven library consortium initiatives. Their advanced technological ecosystems, mature collaborative networks, and well-documented implementation processes offer rich empirical evidence that helps illuminate global trends. Although the Global North does not represent all contexts, its experiences provide foundational insights into scalable models, emerging challenges, and policy frameworks that can inform consortium development worldwide. Analysing these case studies allowed the study capture high-level patterns and best practices that contribute meaningfully to the global perspective it seeks, while creating a basis for future comparative research with underrepresented regions.

To arrive at thorough conclusions on the study objectives, the methodology comprised methodically locating, assessing, and synthesising pertinent papers. Scopus, Web of Science (WoS), IEEE Xplore, Library and Information Science Abstracts (LISA), ProQuest Dissertations & Theses Global, Google Scholar, and the ACM Digital Library were the seven electronic databases that were searched for peer-reviewed articles, reports, and conference proceedings. From March 1, 2010, until March 15, 2025, the search was carried out. With minor modifications based on platform requirements, the following Boolean search strings were applied across databases: (“Artificial Intelligence” OR “AI”) AND (“Library Consortium” OR “Library Consortia” OR “Consortium-based libraries”) AND (“resource sharing” OR “collaborative services” OR “decision-making” OR “user engagement” OR “library operations”)

#### **Inclusion and exclusion criteria**

Articles published between January 2010 and February 2025 met the inclusion requirements. Peer-reviewed journal articles, conference proceedings, theses, technical reports, case studies, and English-language studies were among them. Other literature that particularly addressed AI integration in library consortiums, multi-institutional library settings, or library collaboration models was also included. Articles that only discussed AI in standalone libraries without a consortium setting were excluded based on certain criteria. Publications in languages other than English, editorial notes devoid of scientific content, and literature without implementation frameworks, empirical data, or thorough methodological considerations. Three steps made up the screening and selection process: Initial Title and Abstract Screening was the initial step, in which publications that were deemed irrelevant were eliminated based on their title and abstract. Papers that satisfied all inclusion criteria were kept for data extraction in the Final Selection step, which comes after the Full-Text Review stage, where the remaining papers were thoroughly assessed to ensure methodological rigour and relevance. The selection process was monitored using the PRISMA flow diagram (Fig 1), which displays the number of articles found, screened, added, and removed along with explanations.

Data Extraction and Analysis: a data extraction form was built to capture the following details: Author(s), year, nation, study style (empirical, conceptual, case study), geographic scope, consortium setup, AI technologies used (e.g., machine learning, nat-

ural language processing, recommender systems), goals and results of AI integration, and documented advantages, difficulties, and policy implications.

The findings were categorised using thematic analysis following the goals of the study. The coding and classification of themes, including kinds and applications of AI in consortia, advantages in resource sharing, user engagement, and efficiency, adoption obstacles in developing versus developed countries, and illustrative worldwide case studies, were made easier with the use of NVivo software. The methodological quality of a few chosen studies was evaluated using the Mixed Methods Appraisal Tool (MMAT) for the quality appraisal. To preserve the integrity of the evaluation, studies with poor rigour and transparency scores were not included in the final analysis.

### 1. Understanding the PRISMA Diagram

The PRISMA diagram provides a visual summary of how studies were identified, screened, assessed for eligibility, and finally included in the systematic review. In this study, the PRISMA flow shows:

**Identification:** Total records retrieved from databases (e.g., Scopus, Web of Science, Google Scholar, DOAJ, EBSCOhost) using keywords such as “*Artificial Intelligence AND library consortium,*” “*AI in libraries,*” “*AI resource sharing,*” and “*library networks and AI.*”

- **Screening:** Removal of duplicates and exclusion of titles/abstracts not related to AI or library consortiums.

- **Eligibility:** Full-text assessment of remaining studies to ensure they address AI within institutional, national, or regional consortium contexts.

- **Inclusion:** Final set of empirical studies, technical reports, consortium case studies, project documentation, and policy papers that provided usable data.

The PRISMA diagram therefore demonstrates how the final body of evidence was selected and ensures transparency of the review process.

### 2. How PRISMA Connects to the Results Section

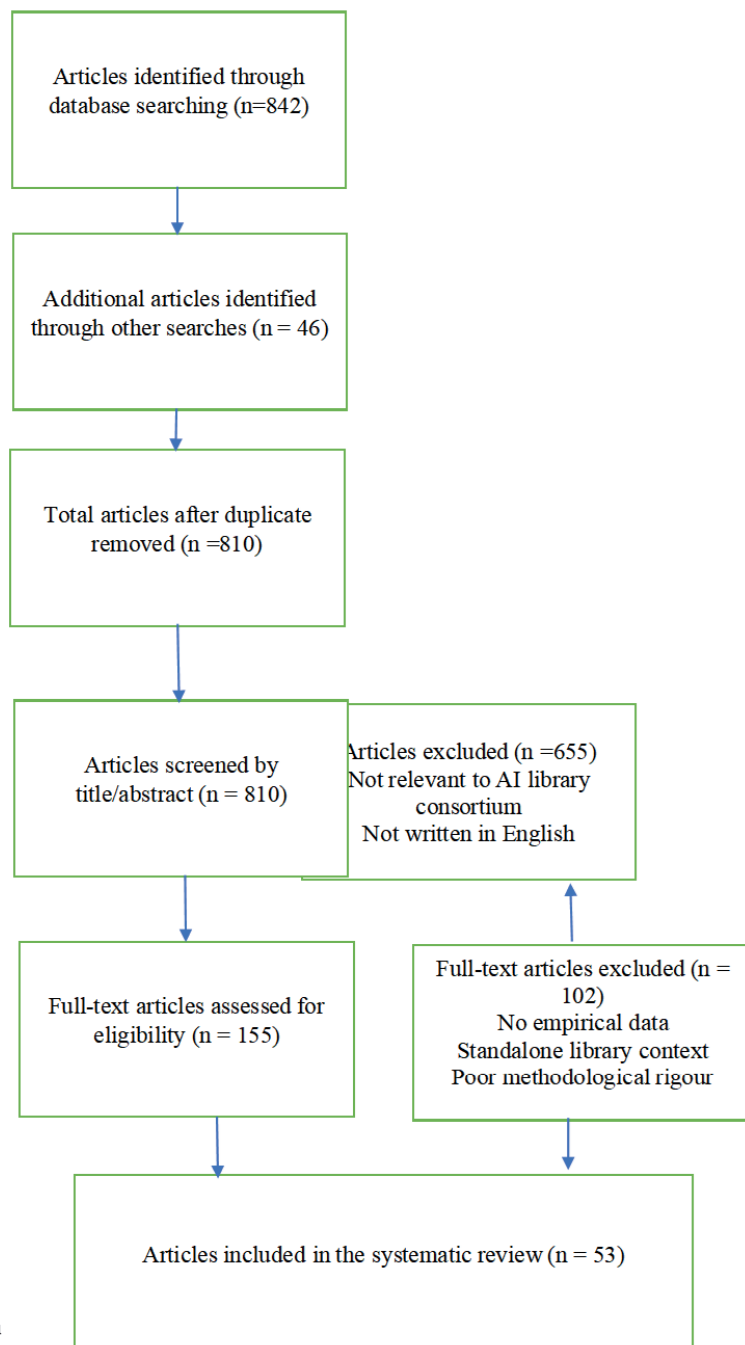
The PRISMA flow directly leads into the Results because the studies that passed all screening stages form the evidence base from which the tables were created. Every row in Tables 1–5 is drawn from the final set of included studies. PRISMA ensures that: The results reflect only systematically verified, credible sources; the tables are based on high-quality, reproducible evidence, and the geographic distribution (Global North, Global South, Asia, etc.) reflects the studies included through the PRISMA process. Thus, PRISMA → Included Studies → Extraction → Coding → Tables → Results.

### 3. How Data Were Collected

Data came from three types of sources:

- (a) Peer-reviewed journals: It covered studies on AI use in library networks, resource sharing, consortium operations, and digital library infrastructures.

- (b) Technical and institutional reports: It captured documents published by organizations such as: OCLC, Jisc, CAUL, CRKN, INFLIBNET, Europeana and CALIS (China Academic Library & Information System). These reports often contain empirical details about AI tools, implementation processes, and outcomes.



**Fig. 1: Prisma Diagram**

*Explanation of PRISMA Flow, Connection to Results,  
and Development of the Tables*

(c) Case study documentation: Captured country or consortium case studies describing actual AI integration processes.

Data Extraction Process: A structured extraction sheet was used to collect: Region/country, type of consortium, AI tool or application, purpose (resource sharing, metadata, user services, etc.), outcome/impact, limitations/challenges, and source/referral. These elements became the raw data from which categories and themes were derived.

#### **4. Data Analysis and Coding (How Themes Were Developed)**

Initial Coding: Open coding was used to read included studies line by line and identify recurring concepts. Examples: “automated metadata enrichment” “AI chatbots for user services”, “resource-sharing optimisation”, “infrastructure challenges” “digital preservation by machine learning”. These phrases were assigned initial codes.

**Axial Coding (Grouping):** Codes were grouped into broader categories such as: Resource Sharing, metadata management, user engagement, decision-making, digital preservation, ethical and legal integration, funding/infrastructure challenges, skill development, regional disparities

**Refinement of Codes:** During analysis, some codes were merged or expanded. For example: “AI for cataloging” and “metadata automation” were merged into Metadata Management., “AI-based recommendation systems” and “chatbots” became User Engagement, “Power and internet issues” expanded to Infrastructure Challenges under developing regions. This iterative coding produced the thematic structure used in the tables.

#### **5. How the Tables Were Developed and Where Their Evidence Comes From**

*Table 1* – Global State of AI Integration: The Table was built from: Studies comparing global initiatives; reports from OCLC, Europeana, Library of Congress, UNESCO, IFLA, and cross-regional analyses in peer-reviewed literature. Each category (e.g., metadata, resource sharing) emerged through thematic coding.

*Table 2* – Region/Country Specific Overview. The Table was constructed by mapping each included study to its geographic region. For example: Japan, South Korea → digital preservation case studies, Europe → metadata and ethical policies, and Africa → resource-sharing challenges. Directly drawn from included case studies and regional research reports.

*Table 3* – Global Benefits of AI for Consortium Challenges. The Table was developed from: Extracted benefits mentioned in the literature, documented outcomes from consortium systems using AI, and case examples such as: OCLC WorldShare, Europeana, Singapore National Library and U.S. and Japanese AI analytics systems

*Table 4* – Global Challenges to AI Adoption: The data in the Table was sourced from: Studies identifying constraints in Africa, Asia, Latin America, infrastructure and funding assessments, and scholarly analyses on digital divides, policy gaps, and ethical issues. These were coded into categories of challenges.

*Table 5* – Case Studies: These rows come from specific empirical cases documented in the included studies: Orbis Cascade Alliance (U.S.), Jisc (U.K.), CRKN (Canada), INFLIBNET (India), CALIS (China), CAUL (Australia), Indigenous Knowledge initiatives (South Africa) and RNP (Brazil). Each case includes verifiable outcomes and references.

Summarily, the PRISMA diagram provides transparency into how the final set of studies was selected for the systematic review. The results presented in Tables 1–5 are

directly derived from the evidence extracted from these studies. Through a rigorous process of data extraction, coding, recoding, and thematic analysis, the review organises global evidence on AI integration into coherent themes reflecting current practices, benefits, challenges, and region-specific case studies. This ensures that the findings are not only comprehensive but also methodologically reliable and globally representative.

## RESEARCH FINDINGS

### **Objective 1: Study the current state of Artificial Intelligence integration in library consortium operations globally**

Table 1 and 2 present the results to achieve this objective.

*Table 1*

#### **The current state of Artificial Intelligence (AI) integration in library consortium operations globally**

<b>Category</b>	<b>Current State</b>	<b>Examples/Observations</b>
<b>Resource Sharing</b>	Limited but emerging AI-driven tools for interlibrary loans, collection analysis, and catalog integration.	AI tools like OCLC's WorldCat use AI to optimize resource-sharing networks across global library consortiums.
<b>Metadata Management</b>	Increasing use of AI for automated metadata generation and curation, but adoption is uneven globally.	AI tools like Ex Libris Alma and Zotero enhance cataloging and metadata consistency.
<b>User Engagement</b>	Personalized recommendation systems are becoming common but mostly in wealthier regions.	AI-driven systems like LibChat and LibAnswers use chatbots to provide real-time assistance to users.
<b>Decision-Making</b>	AI is used for predictive analytics and decision support in acquisitions and resource allocation.	Platforms such as EBSCO Analytics offer insights into user behavior and resource usage patterns.
<b>Knowledge Discovery</b>	AI tools for semantic search and discovery are gaining traction in digital libraries and archives.	Europeana uses AI to improve search accuracy in its vast digital cultural heritage repository.
<b>Open Access and OER</b>	Limited AI use for identifying and managing open educational resources within library consortiums.	AI tools like CORE are used to aggregate and analyze open access materials, improving discoverability.
<b>Data Management</b>	Early stages of AI application for big data analysis in library operations and consortium planning.	Some consortiums leverage AI for citation analysis and scientometric research.
<b>Ethical and Legal Integration</b>	Awareness of ethical AI use is growing, but comprehensive policies are lacking in many regions.	European Union guidelines on AI ethics are influencing library consortium policies.

Table 1 (continued)

<b>Digital Preservation</b>	AI is being used to digitize, transcribe, and preserve archival materials, but adoption is sporadic.	Projects like the Library of Congress' AI transcription initiative demonstrate potential.
<b>Funding and Infrastructure</b>	Significant disparities exist in infrastructure readiness, limiting AI adoption in underfunded regions.	Wealthier nations invest in cloud-based AI systems, while resource-constrained regions lag behind.
<b>Skill Development</b>	Library professionals are being trained in AI, but skills gaps remain in resource-constrained areas.	Programs by IFLA and UNESCO promote digital and AI literacy among library staff globally.
<b>Global Trends</b>	Increasing focus on AI research in libraries, but adoption varies widely based on regional resources.	Consortiums in North America and Europe lead in AI integration, while Africa and South Asia face barriers.

Source: author's own elaboration

Table 1 presents a global snapshot of how Artificial Intelligence is currently being integrated into library consortium operations. The findings show uneven but expanding adoption across key functional areas. AI is increasingly used for metadata management, knowledge discovery, user engagement, and decision-making, with tools such as WorldCat, Alma, and Europeana demonstrating practical applications. However, resource sharing, digital preservation, open access management, and big data analytics remain in early developmental stages, especially in low-resource regions. Major barriers include inadequate funding, infrastructure gaps, and limited staff skills, although global initiatives by UNESCO and IFLA support capacity building. In general, AI adoption is growing but remains regionally imbalanced.

Table 2

**The current state of Artificial Intelligence integration in library consortium operations globally – with region or country specific**

Region/Country	Area of AI Integration	Current State	Examples/Observations
<b>North America</b>	Resource Sharing, User Engagement, Decision-Making	Advanced integration of AI in resource-sharing platforms, user services, and predictive analytics.	OCLC's WorldCat platform uses AI for interlibrary loan optimization across North American consortiums.
<b>Europe</b>	Metadata Management, Knowledge Discovery, Ethical AI Policies	Significant progress in AI-driven metadata management and ethical AI implementation guidelines.	Europeana uses AI for semantic search and metadata enrichment; EU guidelines influence AI adoption in library systems.

Table 2 (continued)

<b>Asia (Japan, South Korea, China)</b>	Digital Preservation, Metadata Automation, Knowledge Discovery	Leading in AI adoption for digital preservation and intelligent knowledge discovery tools.	China's National Library employs AI for digital preservation; South Korea's libraries use AI to curate personalized content.
<b>India</b>	Metadata Management, Open Access Resources, Digital Libraries	AI adoption in early stages, focused on metadata curation and management of open access resources.	Platforms like Shodhganga use AI for organizing theses and research works in digital repositories.
<b>Africa (South Africa, Nigeria)</b>	Resource Sharing, Skill Development, Open Educational Resources	Emerging AI use in resource sharing and digital education, but hampered by infrastructural and funding challenges.	South African consortiums explore AI for data-driven decision-making; Nigeria focuses on AI for managing open educational content.
<b>Middle East (UAE, Israel)</b>	Digital Preservation, User Engagement	Growing investment in AI tools for digital preservation and user experience enhancements.	Israel's National Library employs AI for cultural heritage preservation; UAE libraries are investing in smart digital systems.
<b>Australia</b>	User Engagement, Digital Libraries	Robust AI use in personalized user services and digital library platforms.	AI chatbots and smart search tools are widely adopted in Australian university library consortiums.
<b>Latin America</b>	Resource Sharing, Digital Libraries	Early adoption stages, with efforts to integrate AI in resource sharing and user engagement despite challenges.	Brazil's BIREME initiative uses AI for improving access to health-related library consortium resources.
<b>Eastern Europe (Poland, Czech Republic)</b>	Metadata Management, Digital Libraries	Gradual adoption of AI in metadata and digital library management, with focus on enhancing accessibility.	AI tools are increasingly used in libraries to manage multilingual metadata in Poland and the Czech Republic.
<b>Southeast Asia (Singapore, Malaysia)</b>	Knowledge Discovery, User Engagement	Prominent use of AI for personalized knowledge delivery and user interaction in digital libraries.	Singapore's libraries leverage AI for personalized recommendations; Malaysia employs AI chatbots for public library users.

Source: author's own elaboration

Table 2 highlights regional variations in the adoption of AI within library consortium operations worldwide. North America and Europe show the most advanced and structured integration, particularly in resource sharing, metadata management, and ethical AI governance. Asia, led by Japan, China, and South Korea, excels in digital preservation and knowledge discovery, while Australia demonstrates strong user engagement applications. Regions such as Africa, Latin America, and parts of South Asia are in earlier stages, constrained by funding, infrastructure, and skills gaps. Nonetheless, emerging initiatives in India, Nigeria, and Brazil show growing interest in AI-driven digital libraries and open educational resources. Generally, global adoption reflects diverse priorities shaped by regional capabilities.

**Objective 2: study the potential benefits of AI in addressing challenges such as resource sharing, user engagement, and decision-making within library consortiums**

*Table 3*

**Global overview of the potential benefits of AI in addressing challenges such as resource sharing, user engagement, and decision-making within library consortiums**

Category	Potential Benefits of AI	Global Examples/Applications
<b>Resource Sharing</b>	– Enhanced efficiency in interlibrary loan processes by predicting user demands and optimizing resource distribution.	– OCLC’s WorldShare uses AI to automate resource-sharing workflows in global library networks.
	– Intelligent cataloguing and metadata standardization across consortium libraries.	– Europeana employs AI for metadata enrichment, improving the discoverability of shared resources.
	– Seamless integration of multilingual resources, enabling better resource sharing across linguistic barriers.	– AI in Poland’s libraries helps manage multilingual metadata for resource sharing.
<b>User Engagement</b>	– Personalized user experiences through AI-driven recommendations and content delivery.	– Singapore National Library uses AI for personalized recommendations based on user history.
	– Interactive AI chatbots for 24/7 library assistance, enhancing accessibility and user satisfaction.	– Australian libraries widely adopt chatbots for real-time support and information retrieval.
	– Improved accessibility for differently-abled users through AI-powered assistive technologies, like voice navigation tools.	– South Korea’s libraries utilize AI-driven accessibility tools for visually impaired users.
<b>Decision-Making</b>	– Data-driven insights for library collection development and resource allocation.	– U.S. libraries employ AI analytics to predict usage trends and inform acquisitions.
	– Predictive analytics to identify emerging user needs and trends for proactive decision-making.	– AI in Japanese libraries forecasts trends in academic research to shape service offerings.

Table 3 (continued)

	– AI-powered dashboards for real-time monitoring of consortium performance metrics.	– UAE’s libraries are piloting AI dashboards for operational efficiency assessments.
<b>Operational Efficiency</b>	– Automation of repetitive tasks, such as cataloging and indexing, freeing staff for more strategic roles.	– AI tools in German libraries streamline cataloging processes, reducing human workload.
	– Optimization of digital preservation through AI algorithms that ensure long-term resource sustainability.	– AI in China’s National Library automates digital preservation workflows.
<b>Inclusivity</b>	– Democratization of knowledge through AI-driven open access platforms and tools.	– South Africa’s library consortiums use AI to manage open educational resources and reduce knowledge gaps.
	– Bridging the digital divide by tailoring resources to underserved communities using predictive AI tools.	– AI-supported resource-sharing initiatives in Nigeria focus on addressing regional disparities in resource access.
<b>Knowledge Discovery</b>	– AI-enhanced search tools for faster and more accurate information retrieval.	– Europeana leverages AI-powered semantic search to improve the user discovery experience.
	– Machine learning models for analyzing patterns in large data sets, revealing hidden insights.	– AI in Brazil’s library networks supports large-scale text mining for academic research.

Source: author’s own elaboration

Table 3 highlights how AI significantly strengthens library consortium operations by improving efficiency, user engagement, and strategic decision-making. In resource sharing, AI enhances interlibrary loan efficiency, enriches metadata, and supports multilingual access, as demonstrated by OCLC, Europeana, and libraries in Poland. For user engagement, AI enables personalized recommendations, 24/7 chatbot assistance, and improved accessibility, with strong applications in Singapore, Australia, and South Korea. Decision-making improves through predictive analytics and real-time dashboards used in the U.S., Japan, and UAE. AI also boosts operational efficiency and inclusivity through automation and open-access support, while advancing knowledge discovery via semantic search and large-scale data analysis.

Table 4 illustrates that AI adoption in library consortiums faces region-specific challenges, especially in resource-constrained settings. African and South Asian libraries grapple with inadequate funding, weak infrastructure, and limited technical expertise. Latin America and the Middle East face economic and political instability, affecting policy continuity and skilled workforce retention. Southeast Asian and island nations struggle with the high cost of AI tools and limited vendor support. Eastern Europe confronts outdated infrastructure and insufficient government backing. Even advanced regions like North America and Western Europe contend with ethical, privacy, and regulatory constraints. East Asian libraries face rapid technological shifts and uneven access, especially between urban and rural areas.

**Objective 3: Identify the challenges to adopting AI in library consortiums, particularly in resource-constrained settings**

Table 4

**Global overview of challenges to adopting AI in library consortiums, particularly in resource-constrained settings**

Region/Country	Challenges	Examples/Specific Issues
<b>Africa (e.g., Nigeria, Kenya)</b>	<ul style="list-style-type: none"> <li>– Limited funding for AI infrastructure and training.</li> <li>– Lack of skilled professionals.</li> <li>– Poor internet connectivity and power supply.</li> </ul>	<ul style="list-style-type: none"> <li>– Nigerian libraries struggle to integrate AI due to budgetary constraints.</li> <li>– Rural libraries in Kenya lack stable internet access.</li> </ul>
<b>South Asia (e.g., India, Pakistan)</b>	<ul style="list-style-type: none"> <li>– Resistance to change due to lack of awareness.</li> <li>– Inequality in access to technology between urban and rural areas.</li> </ul>	<ul style="list-style-type: none"> <li>– Limited awareness of AI's benefits in Pakistani library consortiums.</li> <li>– Rural libraries in India are under-resourced for AI integration.</li> </ul>
<b>Latin America (e.g., Brazil, Mexico)</b>	<ul style="list-style-type: none"> <li>– Political instability affects funding and policy implementation.</li> <li>– Language barriers in AI tools.</li> </ul>	<ul style="list-style-type: none"> <li>– Brazilian libraries face challenges with AI tools designed for English-speaking users.</li> <li>– Mexico's library budgets are inconsistent.</li> </ul>
<b>Southeast Asia (e.g., Philippines, Indonesia)</b>	<ul style="list-style-type: none"> <li>– Difficulty accessing affordable AI solutions.</li> <li>– Limited technical support for AI systems.</li> </ul>	<ul style="list-style-type: none"> <li>– Libraries in the Philippines struggle with the cost of AI implementation.</li> <li>– Indonesian libraries lack local AI vendors.</li> </ul>
<b>Middle East (e.g., Jordan, Lebanon)</b>	<ul style="list-style-type: none"> <li>– Economic instability limiting investment.</li> <li>– Brain drains of skilled professionals.</li> </ul>	<ul style="list-style-type: none"> <li>– Lebanese libraries face disruptions due to economic crises.</li> <li>– Jordan's libraries experience shortages in AI expertise.</li> </ul>
<b>Eastern Europe (e.g., Ukraine, Moldova)</b>	<ul style="list-style-type: none"> <li>– Limited government support for library innovation.</li> <li>– Outdated IT infrastructure.</li> </ul>	<ul style="list-style-type: none"> <li>– Ukrainian libraries' digitization projects are delayed due to outdated infrastructure.</li> <li>– Moldovan libraries lack AI-specific funding.</li> </ul>
<b>Small Island Developing States (e.g., Fiji, Caribbean)</b>	<ul style="list-style-type: none"> <li>– Vulnerability to natural disasters affecting infrastructure.</li> <li>– Small budgets for technological advancements.</li> </ul>	<ul style="list-style-type: none"> <li>– Fijian libraries struggle to maintain AI systems post-cyclones.</li> <li>– Caribbean libraries face chronic underfunding.</li> </ul>
<b>North America (e.g., United States, Canada)</b>	<ul style="list-style-type: none"> <li>– Privacy concerns and ethical issues.</li> <li>– Uneven adoption across consortia.</li> </ul>	<ul style="list-style-type: none"> <li>– U.S. libraries debate AI's impact on user data privacy.</li> <li>– Smaller Canadian libraries lack the resources to keep pace with larger systems.</li> </ul>

Table 4 (continued)

<b>Western Europe (e.g., Germany, France)</b>	<ul style="list-style-type: none"> <li>– Concerns over AI replacing human expertise.</li> <li>– Regulatory challenges.</li> </ul>	<ul style="list-style-type: none"> <li>– German library staff fear job displacement due to AI.</li> <li>– French libraries navigate complex EU data regulations for AI use.</li> </ul>
<b>East Asia (e.g., China, Japan)</b>	<ul style="list-style-type: none"> <li>– High costs of cutting-edge AI solutions.</li> <li>– Rapid tech changes outpacing libraries' ability to adapt.</li> </ul>	<ul style="list-style-type: none"> <li>– Chinese libraries prioritize urban centres, neglecting rural areas.</li> <li>– Japanese libraries face challenges with ongoing AI updates.</li> </ul>

Source: author's own elaboration

#### **Objective 4: Identify case studies on Artificial Intelligence integration in library consortium operations globally**

A tabular format showcasing global case studies on Artificial Intelligence (AI) integration in library consortium operations, highlighting country or region specifics is provided in Table 5.

Table 5

#### **Country or region-specific case studies on Artificial Intelligence integration in library consortium operations globally**

<b>Country/Region</b>	<b>Library Consortium</b>	<b>AI Integration Use Case</b>	<b>Outcomes/Impact</b>	<b>References</b>
<b>United States</b>	Orbis Cascade Alliance	Automated metadata enrichment using AI tools for shared cataloguing processes.	Improved cataloguing efficiency and resource sharing; reduced human errors in metadata creation.	Case studies from U.S. academic libraries (Helmer et al., 2012).
<b>United Kingdom</b>	Jisc Library Hub	AI-powered predictive analytics to optimize resource sharing and acquisition among member institutions.	Data-driven decision-making in acquisition policies; better resource distribution across libraries.	Reports on Jisc innovations (Findlay, 2023).
<b>Canada</b>	Canadian Research Knowledge Network (CRKN)	AI for big data analytics in licensing negotiations with publishers.	Cost reductions in subscription fees; enhanced negotiation strategies through data insights.	CRKN annual reports (Breeding, 2013; CRKN Survey, 2020)
<b>India</b>	INFLIBNET (Information and Library Network)	AI chatbots to assist with real-time query resolution and inter-library loan requests.	Increased user satisfaction; streamlined inter-library loan operations.	INFLIBNET project updates ("INFLIBNET", 2020).

Table 5 (continued)

<b>South Africa</b>	South African National Library Consortium	AI for text mining and content analysis of indigenous knowledge databases.	Enhanced discoverability of indigenous resources; support for decolonized education.	Indigenous knowledge research papers ICOLC International Coalition of Library Consortia (2024).
<b>China</b>	China Academic Library & Information System	AI-powered recommendation engines for personalized resource discovery among consortium libraries.	Improved user engagement; increased utilization of resources across institutions.	Case studies from CALIS (Sivasankari et al., 2024; Jia & Shi, 2013).
<b>Germany</b>	German National Library Consortium	AI tools for semantic indexing of shared digital collections.	Better searchability and accessibility of resources through enhanced indexing.	German National Library reports (German National Library, 2024).
<b>Australia</b>	Council of Australian University Librarians	AI-driven systems for demand-driven acquisitions and automated copyright compliance checks.	Cost-effective acquisitions; reduced legal risks in resource sharing.	CAUL initiatives (Goedeken & Lawson, 2015).
<b>Nigeria</b>	Nigerian Library Consortium	AI for digitization and preservation of shared resources, focusing on historical documents and cultural heritage.	Preservation of rare and fragile documents; increased access to Nigerian heritage materials.	Reports on digital preservation in Nigeria (Akinola et al., 2024).
<b>Brazil</b>	Rede Nacional de Ensino e Pesquisa (RNP)	AI for managing access to e-resources and monitoring usage patterns across member institutions.	Optimized e-resource usage; support for data-informed budgeting and planning.	RNP reports on AI.

Source: author's own elaboration

Table 5 highlights diverse country-specific case studies showcasing how AI is being integrated into library consortium operations globally. High-income regions such as the United States, United Kingdom, Canada, Germany, China, and Australia demonstrate advanced adoption, using AI for metadata automation, predictive analytics, big-data negotiations, semantic indexing, and personalised recommendations leading to efficiency gains, cost savings, and improved user engagement. Middle-income countries like India, South Africa, Brazil, and Nigeria focus on AI for chatbots, indigenous knowledge mining, e-resource management, and digital preservation, resulting in enhanced access and cultural heritage protection. Collectively, the table illustrates AI's broad im-

pact across varying economic and technological contexts, improving collaboration and knowledge delivery worldwide.

### ***Discussion Issues***

The outcome highlights both areas of progress and enduring challenges in the varied and uneven levels of AI integration in library consortiums around the world. The use of AI technology for library consortium operations varies by nation and location depending on local priorities, financing, and infrastructure. They support Rahmani's (2023) report, which found that the uneven and varied status of AI integration in library consortiums around the world is a reflection of differences in local priorities, money, and infrastructure between nations and regions. The author said that advanced countries with strong digital infrastructures, including the US and Europe, have advanced significantly in implementing AI technologies for consortium operations.

Personalised user services, AI-driven metadata management, and automated resource sharing are a few examples of innovations that have been made possible by significant investment and creative regulations. On the other hand, some developing regions, particularly portions of Asia and Africa, struggle with issues such as a lack of funding, poor technical infrastructure, and a lack of AI knowledge. These obstacles prevent them from realizing the full potential of AI, which slows adoption and reduces creativity in consortium activities. Ifegwu-Mbonu (2024) highlighted that capacity-building programs, cross-border partnerships, and equitable funding mechanisms can help create opportunities for underrepresented regions to adopt AI technologies, ensuring global inclusivity in library operations. This uneven integration highlights the need for collaborative international efforts to bridge these gaps.

The findings show that AI has the potential to revolutionize a number of aspects of library consortium operations, such as the smooth integration of multilingual resources, improved resource sharing across linguistic barriers, and the personalisation of user experiences through AI-driven content delivery and recommendations, demonstrating global applications and their efficacy in resolving particular issues. The paper emphasises how AI has the ability to completely change important facets of library consortium operations. This is consistent with a noteworthy discovery by Mohamed et al. (2024) on AI's capacity to support the smooth integration of multilingual resources, addressing linguistic diversity and facilitating improved resource sharing among linguistically diverse regions. According to the paper, this feature has a particularly significant influence on international consortiums, promoting inclusivity by guaranteeing users from a variety of language backgrounds fair access to knowledge for users from diverse linguistic backgrounds thereby relating to the report by Mouboua et al. (2024). The tailoring of user experiences through sophisticated recommendation algorithms and content delivery methods is another important contribution of AI. AI will be able to make personalised recommendations by analyzing user behavior and preferences, which will increase user engagement and pleasure. This degree of customization ensures that people can find and access pertinent information with ease, making library services more user-centric and effective. These uses show how AI may effectively address certain issues like resource discoverability and language difficulties. Tackling these problems will make AI improves library consortiums' relevance and worldwide applicability, encouraging cooperation and fair access to knowledge.

The study also offers a regional overview of the difficulties, emphasizing how different technological, socioeconomic, and policy contexts influence AI adoption in library consortiums. In line with the report by Kalbande et al. (2024a, 2024b), the study's region-specific analysis highlights the important impact of socioeconomic, technological, and policy settings on the adoption of AI in library consortiums. AI adoption is stronger in more affluent areas, like North America and portions of Europe, with sophisticated digital infrastructure and well-funded libraries. Strong legislative frameworks, a trained labour pool, and steady financing for integrating AI into processes like resource sharing and user customisation are advantages for these areas. Otherwise, issues including a lack of funding, poor internet infrastructure, and a lack of legislative backing impede the adoption of AI in developing nations like sections of Africa, South Asia, and Latin America. These obstacles are made worse by socioeconomic inequality, which prevents many libraries from having access to the technology or implementation knowledge they require. As previously highlighted by Ifegwu-Mbonu (2024), this finding highlights the necessity of customized approaches to address regional challenges, such as capacity-building programs, international collaboration, and equitable funding mechanisms, to enable under-resourced regions to adopt AI effectively and promote global inclusivity and innovation.

The Canadian Research Knowledge Network (CRKN), the Jisc Library Hub in the United Kingdom, and the Orbis Cascade Alliance in the United States are a few examples of region-specific case studies. The regional case studies, like the Canadian Research Knowledge Network (CRKN), the Orbis Cascade Alliance in the US, and the Jisc Library Hub in the UK, demonstrate how AI integration in library consortiums reflects a variety of strategies for improving cooperation and resource sharing, which is consistent with the report (Breeding, 2013). Through the use of AI to streamline cataloguing and resource discovery, the Orbis Cascade Alliance helps member libraries enhance user experiences and maximize shared services. Additionally, according to the research by Findlay (2023), Jisc Library Hub in the UK uses AI-driven solutions to integrate resources from many academic libraries, guaranteeing effective data management and smooth access for users across institutions. Similarly, CRKN in Canada emphasises national research and educational priorities by using AI to enhance user-centric services, metadata enrichment, and digital preservation (*CRKN Survey*, 2020). These illustrations show how regional factors, such as resources, infrastructure, and strategic objectives, influence how AI is used in consortiums. They also showcase cutting-edge methods and best practices that might act as templates for international library partnerships.

## CONCLUSIONS

This study demonstrates that Artificial Intelligence is rapidly reshaping the operational, strategic, and collaborative landscape of library consortiums across the world. Evidence from different regions reveals that AI enhances key consortium functions such as resource sharing, metadata management, user engagement, decision-making, digital preservation, and knowledge discovery. In technologically advanced regions including North America, Europe, East Asia, and Australia AI adoption is more mature, resulting in streamlined cataloguing, predictive analytics for acquisitions, personalized services, and improved operational efficiency. These regions showcase how well-funded infrastructures and strong policy frameworks accelerate innovation and allow consortiums to experiment with more sophisticated AI tools. In contrast, emerging econo-

mies in Africa, South Asia, Latin America, Southeast Asia, and Small Island Developing States display a slower yet steadily growing integration of AI. Their efforts typically centre on improving access to digital resources, strengthening open educational content, and preserving cultural heritage. The challenges identified such as inadequate funding, infrastructural limitations, lack of expertise, economic instability, and language barriers illustrate the uneven landscape of AI readiness across global regions. In spite of these constraints, the case studies highlight that even modest AI adoption in resource-constrained environments can yield significant benefits, including increased access to cultural collections, improved resource organisation, and enhanced service delivery. Generally, the findings confirm that AI presents transformative potential for strengthening library consortium operations. However, its adoption is neither uniform nor without consequences. Issues of digital equity, ethics, privacy, environmental impact, and sustainability underscore the need for balanced technological advancement. Therefore, the study recommends global cooperation among consortiums, targeted capacity building, supportive regulatory environments, and context-specific AI solutions that address local challenges. Embracing AI responsibly will enable library consortiums worldwide to expand access to knowledge, foster inclusive digital ecosystems, and ensure that information infrastructures remain resilient, adaptive, and future-ready.

### **Contribute to the global discourse on AI's role in fostering inclusivity, efficiency, and innovation in library consortium building**

Beyond operational enhancements, AI has a direct impact on how libraries interact with their communities and promotes inclusivity, efficiency, and creativity in library consortium creation. AI has the potential to help dismantle obstacles for marginalised communities in terms of inclusivity. Libraries that serve isolated or rural regions, for instance, can use AI to improve access to digital materials while overcoming technological and geographic obstacles. AI's capacity to examine user behaviour data enables libraries to tailor services and material to the needs of a variety of user groups, such as researchers, non-traditional students, people with particular learning difficulties, and people with preferred languages. AI has the potential to revolutionize library consortium operations by enhancing access, closing gaps, and managing shared resources more effectively.

In terms of fostering inclusivity, one of AI's most significant contributions is in making library services more inclusive. AI-driven tools, such as chatbots and natural language processing systems, provide real-time assistance and support, making it easier for a wider range of users, including those with disabilities, to access library services. Through offering multi-lingual capabilities, AI tools can break down language barriers, ensuring that diverse communities can benefit from library resources. More so, AI's ability to predict user needs and recommend resources tailored to individual preferences promotes equitable access, particularly for underrepresented and marginalized groups. This inclusivity is crucial in library consortiums that serve varied populations across different regions.

In terms of increasing productivity, AI makes it possible for consortiums to work more effectively by automating tedious jobs. AI-based solutions, for example, can manage the production, cataloguing, and indexing of metadata, limiting human error and the amount of manual labour needed from library employees. In order to ensure that

resources are distributed efficiently and following user demand, predictive analytics also assists consortiums in optimizing resource allocation based on real-time data. Through automating requests and tracking items, AI can improve member library collaboration, shorten patron wait times, and streamline interlibrary loan procedures. In addition to increasing operational effectiveness, this automation frees up human resources for more important, valuable duties.

Bringing new technology and approaches to information management and access enables AI to stimulate innovation in library consortiums. AI, for instance, can be applied to advanced data analytics, which enables consortium members to spot patterns in user behaviour, enhance collections, and customize services to meet particular requirements. Furthermore, the way users engage with library systems is being revolutionized by AI's ability to personalise learning and discovery experiences. Libraries can direct patrons to pertinent content and improve their overall experience by employing machine learning algorithms to anticipate what resources patrons might need next. AI also facilitates creative initiatives like digitising rare and delicate materials, and protecting cultural heritage while guaranteeing wider digital access.

AI has a significant impact on library consortiums' ability to innovate, increase efficiency, and promote diversity. The adoption of AI by library consortiums can lead to improvements in global information management practices by making them more responsive, inclusive, and flexible to the changing demands of their patrons.

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## ВИКОРИСТАННЯ ШТУЧНОГО ІНТЕЛЕКТУ ДЛЯ СТВОРЕННЯ БІБЛІОТЕЧНИХ КОНСОРЦІУМІВ: ГЛОБАЛЬНИЙ ОГЛЯД В АСПЕКТІ СИСТЕМАТИЗАЦІЇ

**Мета статті** – дослідити шляхи використання штучного інтелекту для формування бібліотечних консорціумів.

**Методи дослідження.** У статті застосовано підхід, що поєднує аналіз тематичних досліджень та огляд літератури з метою дослідження ШІ в бібліотечних консорціумах. Відтворено різноманітний і нерівномірний стан інтеграції ШІ в бібліотечні консорціуми усього світу, висвітлено сфери прогресу й поточні проблеми. Зазначено, що країни і регіони по-різному впроваджують технології ШІ в роботу бібліотечних консорціумів залежно від інфраструктури, фінансування та місцевих пріоритетів.

**Наукова новизна.** Пропоноване дослідження визначає оригінальні перспективи того, як ШІ може революціонізувати роботу бібліотечних консорціумів, підвищуючи інклюзивність, ефективність та інновації. У ньому подано практичні рекомендації щодо застосування ШІ для оптимізації спільного використання ресурсів, автоматизації адміністративних завдань та покращення залучення користувачів, надано цінні знання до глобального дискурсу стосовно майбутньої співпраці бібліотек.

**Основні висновки.** У дослідженні розкрито трансформаційний потенціал ШІ в різних аспектах роботи бібліотечних консорціумів, включаючи безшовну інтеграцію багатомовних ресурсів, що забезпечує кращий спільний доступ до ресурсів через мовні бар'єри та

персоналізацію користувацького досвіду за допомогою рекомендацій і доставки контенту на основі ШІ, демонструючи цим глобальні програми та їхню ефективність у подоланні конкретних проблем. Наукова розвідка також надає огляд проблем, специфічних для регіону, підкреслюючи, як різні соціально-економічні, технологічні й політичні середовища формують впровадження ШІ в бібліотечних консорціумах. Проаналізовано роботу Orbis Cascade Alliance у Сполучених Штатах Америки, JISC Library Hub у Великій Британії та Канадської мережі дослідницьких знань (CRKN). У підсумку зазначено, що інтеграція ШІ в бібліотечні консорціуми може значно покращити доступність послуг, операційну ефективність та управління ресурсами. Завдяки автоматизації завдань і пропонуванню персоналізованого користувацького досвіду ШІ може покращити інклюзивність та ефективність бібліотек, формуючи майбутнє спільного обміну знаннями й оптимізації ресурсів у глобальному масштабі. Продемонстровано, що ШІ швидко змінює операційний, стратегічний та спільний ландшафт бібліотечних консорціумів по всьому світу. Дані з різних регіонів показують, що ШІ покращує важливі функції консорціуму, такі як спільне використання ресурсів, управління метаданими, залучення користувачів, прийняття рішень, цифрове збереження і пошук знань у технологічно розвинених регіонах, включаючи Північну Америку, Європу, Східну Азію та Австралію.

*Ключові слова:* створення консорціуму; спільне використання ресурсів; штучний інтелект; бібліотека; якісний метод.

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