

A Theoretical Approach to AI Mechanisms and Strategies for Developing Professional Competencies in the Library and Information Sector

مقاربة نظرية في آليات واستراتيجيات الذكاء الاصطناعي في تنمية الكفاءات المهنية بقطاع المكتبات والمعلومات

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Article abstract:

This study explores the role of Artificial Intelligence (AI) in developing professional competencies in the library and information sector. Based on a theoretical literature review, it analyzes mechanisms and strategies for integrating AI into training and professional development. The findings highlight AI's capacity to enhance learning, decision-making, knowledge management, and user interaction, while noting challenges such as strategic planning and balancing with traditional skills. The study concludes that AI provides a strategic opportunity to advance competencies and support the transition toward sustainable smart libraries.

Key words: Artificial Intelligence; Libraries; Professional Competencies; Training.

ملخص المقال :

تهدف هذه الدراسة إلى استكشاف دور الذكاء الاصطناعي في تنمية الكفاءات المهنية بقطاع المكتبات والمعلومات. وانطلاقاً من مراجعة أدبية نظرية، تحلل الآليات والاستراتيجيات الخاصة بدمج الذكاء الاصطناعي في برامج التدريب والتطوير المهني. وتبين النتائج قدرة الذكاء الاصطناعي على تعزيز التعلم، واتخاذ القرار، وإدارة المعرفة، والتفاعل مع المستخدمين، مع إبراز تحديات تتعلق بالتخطيط الاستراتيجي، والتكيف الثقافي، والتوازن مع المهارات التقليدية. وخلصت الدراسة إلى أن الذكاء الاصطناعي يمثل فرصة إستراتيجية لتطوير الكفاءات المهنية وتمكين المكتبات من التحول نحو مكتبات ذكية مستدامة.

كلمات مفتاحية: الذكاء الاصطناعي؛ المكتبات؛ الكفاءات المهنية؛ التدريب.

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Introduction

In recent decades, the world has witnessed unprecedented transformations driven by rapid technological advancements, with Artificial Intelligence (AI) at the forefront of these shifts. AI has emerged as a driving force in reshaping traditional practices across sectors, particularly within libraries and information science. Beyond automating tasks, AI plays a pivotal role in restructuring professional human competencies, empowering staff with intelligent tools that enhance performance and foster professional innovation (Russell & Norvig, 2021).

In this context, libraries and information centers are increasingly required to adopt advanced mechanisms for professional training and development to effectively utilize AI applications, such as recommendation systems, intelligent reference services, big data analytics, and automated content classification (Liu, 2020, p.751). However, the effective use of these tools demands clear strategies for strengthening professional competencies, including continuous training, skills upgrading, and integrating analytical and digital thinking into library work environments (IFLA, 2022).

Previous studies have shown that institutions investing in AI to enhance staff competencies achieve significant transformations in service quality and demonstrate greater adaptability to the rapidly changing needs of users (PwC, 2019). In the Arab context, recent research has highlighted the potential of AI in supporting smart services and building sustainable digital environments (عمر، 2022، ص.115؛ العبيدي، 2021)، while also emphasizing that success depends on strong knowledge and training infrastructures that support the transition of staff from traditional roles to more innovative and specialized ones (بن عميرة، 2023).

Against this backdrop, the present study, entitled “A Theoretical Approach to AI Mechanisms and Strategies for Developing Professional Competencies in the Library and Information Sector”, seeks to analyze challenges, review best practices, and propose practical frameworks capable of aligning technological advancement with professional development within library environments.

Research Problem

The library and information sector is experiencing significant transformations with the integration of artificial intelligence, improving service quality and professional competencies. Yet, limited staff skills hinder optimal use of these technologies (IFLA, 2022; Russell & Norvig, 2021), while Arab libraries show slow adoption due to the lack of systematic training (عمر، 2022، ص.117؛ العبيدي، 2021، ص.68). This raises the key question: **What mechanisms and strategies can leverage AI to develop professional competencies in the library and information sector?**

This study adopts a theoretical approach based on a critical analysis of the relevant literature, emerging from key questions regarding the extent to which artificial intelligence (AI) contributes to the development of professional competencies in the library and information sector, and the challenges hindering its effective adoption. It aims to analyze the mechanisms and strategies through which AI can enhance professional skills, identify barriers, and highlight theoretical models that support this process. The study seeks to enrich Arabic scholarly discourse by providing a critical perspective, while offering practical insights to guide the formulation of training strategies that strengthen staff readiness for digital transformation and support the development of smart libraries.

Significance of the Study

The scientific importance of this study lies in enriching Arabic scholarship through an analytical perspective on how artificial intelligence can enhance professional competencies in libraries rather than threaten them. The practical importance emerges in enabling library institutions to apply the study's findings

to develop effective training strategies that prepare human resources for digital transformation and support the creation of intelligent, technology-integrated libraries.

Objectives of the Study

This study aims to explore effective strategies for integrating artificial intelligence into the development of human competencies in the library and information sector through a critical analytical approach grounded in relevant literature and contemporary practices. Specifically, it seeks to:

1. Examine the role of AI in enhancing librarians professional skills and functions.
2. Identify key challenges limiting human resource engagement with AI applications.
3. Review theoretical models for aligning workforce development with digital transformation.
4. Anticipate the future dynamics between AI and human capital in library settings.
5. Enrich library and information science literature on the nexus between emerging technologies and human resource development.

Previous Studies:

In this context, a selection of studies addressing artificial intelligence in libraries and the development of professional competencies in digital information environments was chosen as a fundamental step to understand the scientific background of the topic, identify the paths followed by researchers, and highlight the knowledge gaps that still require attention. These studies are presented in the following sequence:

First Study: Fatima Al-Obaidi (2021), *Employing Artificial Intelligence Techniques to Develop User Services in Research Libraries*. اعتمدت

الدراسة This study adopted a descriptive-analytical approach and aimed to examine the extent to which AI applications are used to improve user services in research libraries at Algerian universities. The study reached several key findings, notably:

- ✓ AI adoption is still at an early stage and largely linked to individual initiatives.
- ✓ The absence of systematic training programs for staff highlights a gap between available technology and the competencies of human resources.
- ✓ The study also emphasizes the need for institutional strategies to train staff in AI tools, an aspect that our study seeks to analyze and elaborate on.

This study intersects with ours in highlighting the limited use of AI in research libraries and the insufficient development of professional competencies in this area. Consequently, our study extends Al-Obaidis recommendations by proposing practical, implementable solutions within the library environment.

Second Study: Omar, Shaimaa (2022). *Artificial Intelligence and Its Applications in University Libraries: An Analytical Study*. الذكاء الاصطناعي وتطبيقاته في المكتبات الجامعية: دراسة تحليلية.

Shaimaa Omars study explored contemporary trends in Artificial Intelligence (AI) and their influence on the organizational structure of university libraries. The research specifically examined AI applications in core library operations, including intelligent cataloging, digital assistants, and smart recommendation systems. The study emphasized that the mere adoption of technological tools is insufficient to achieve comprehensive and effective digital transformation within library institutions. Rather, such transformation requires systematic development of human competencies capable of effectively leveraging these technologies.

The study identified several key findings:

- ✓ A lack of digital transformation awareness among some library staff constitutes a major barrier to the full utilization of AI applications.
- ✓ AI-based tools, such as intelligent cataloging, digital assistants, and recommendation systems, play a significant role in enhancing the organizational framework of university libraries.

✓ Investments in technology alone, without corresponding human competency development, produce limited results.

Third Study: International Federation of Library Associations and Institutions (IFLA)

A global report issued by IFLA entitled: Artificial Intelligence and Libraries: A Global Report examines the state of AI applications in libraries of various types and presents examples from both developed and developing countries. Among its key recommendations is the need to train library staff in using these technologies within continuous professional development programs that integrate technical knowledge with analytical skills. The report highlights several findings:

- ✓ Priority of AI adoption: 43% of participants indicated that AI-based tools are among their top technical priorities for the next twelve months, reflecting growing interest in employing these technologies in library services.
- ✓ Early stages of implementation: Over 60% of libraries are either assessing or planning to integrate AI technologies, indicating that many are still in the initial adoption phases (digital-scholarship.org).
- ✓ Support for core library functions: Libraries implementing or exploring AI aim to support student learning (52%), enhance research excellence (47%), and improve content discoverability (45%), aligning with their primary mission (UKSG; Infolibnet; digital-scholarship.org).
- ✓ Implementation challenges: Libraries face challenges such as lack of AI skills (32% reported insufficient training) and budget constraints (47% cited reduced budgets as a major barrier), which hinder effective adoption.

Accordingly, this report provides a strong theoretical reference for the current study, emphasizing that the success of AI in libraries depends on qualified and up-to-date professional competencies.

Fourth Study: Russell and Norvig –Artificial Intelligence: A Modern Approach

This study, published as a book, is considered one of the foundational global references in the field of artificial intelligence. Although it focuses primarily on the theoretical and technical aspects, it emphasizes the importance of understanding the “human context” in AI applications, especially within service-oriented institutions such as education and information organizations. The authors highlight that the sustainability of AI systems requires trained and knowledgeable human resources. Key findings include:

- ✓ AI is not an isolated technology but a system that requires understanding the human and social context in which it is applied, particularly in service institutions such as libraries and educational settings.
- ✓ The sustainability of intelligent systems depends on human resources in terms of competence and the ability to adapt to new technologies with flexibility and deep understanding.
- ✓ It is essential to train and qualify staff in institutions using AI to ensure optimal utilization and achieve the intended objectives of these systems.
- ✓ Successful AI applications are linked to the integration of technical programming and human understanding, highlighting the importance of combined technical and cognitive training.

This study supports the conceptual framework of our research by linking AI to the human element within a comprehensive perspective, emphasizing that the effectiveness and sustainability of AI systems depend not only on technical infrastructure but also on the awareness and understanding of the humans who manage and use them. The book underscores the necessity of incorporating the “human context” in AI applications, particularly in service-oriented institutions like libraries and information centers. Accordingly, our study aims to analyze strategies that foster professional competencies to ensure the effective and sustainable use of these systems.

Fifth Study: Post-AI Library Prospects: From Automation to Predictive Thinking آفاق المكتبات ما بعد الذكاء

الاصطناعي: من الأتمتة إلى التفكير التنبئي (Benamira, Abdelkarim, 2023) This influence of artificial intelligence, calling for a reconstruction of human roles within libraries, with a focus on analytical skills, oversight of algorithms, and the formulation of strategies for interacting with intelligent systems.

This paper contributes to the current study by grounding the shift from “traditional roles” to unpublished research paper addresses the changes that have occurred in the nature of library roles under the “intelligent roles” for library staff, thereby supporting the arguments and framework of the present research.

Summary of Previous Studies: Analysis of these studies reveals that most of them focused on:

- ✓ Presenting AI applications in libraries.
- ✓ Identifying technical and organizational challenges.
- ✓ *Advocating for training and professional development.

However, the relationship between artificial intelligence and the development of professional competencies has not received a deep and focused theoretical analysis. This is precisely the aim of the present study, which adopts an analytical approach combining both the technical and human dimensions within the library environment.

1. Artificial Intelligence in Libraries: Essence and Applications

1.1 Definition :

Artificial intelligence (AI) has been defined in various ways across disciplines, reflecting diverse perspectives and theoretical approaches. It is thus a complex, multidimensional concept shaped by multiple interdisciplinary viewpoints.

- According to Merriam-Webster Dictionary: "A system or the capability of a machine to imitate human intelligence, including decision-making and learning from experience" (Oxford, 2015).
- The Encyclopedia Britannica defines it as: "Artificial intelligence is the ability of computers or digital systems to perform tasks typically associated with human intelligence, such as learning, reasoning, and problem-solving" (Encyclopedia Britannica, 2023).
- Computer scientists and AI experts Stuart Russell and Peter Norvig define it as: "The ability to design computer systems that perform tasks requiring human intelligence, such as reasoning, understanding, learning, and interacting with the environment" (Russell & Norvig, 2021).
- Sociologist Shoshana Zuboff (2019) views AI not merely as a technology but as a central tool in surveillance capitalism, shaping behavior and social control. Sociologists focus on AI's social, cultural, and political impacts, rather than just its technical aspects.
- In the humanities and psychology, artificial intelligence is viewed as a technical system that simulates human cognitive processes such as reasoning, learning, and decision-making, without possessing self-awareness. It is considered a mirror of the human self, designed based on humans understanding of their own behavior. AI is also seen as a cultural construct reflecting the social values and cognitive biases of the societies that produce it. As Daniel Kahneman (2011) noted, "Artificial intelligence simulates some cognitive processes, such as reasoning and decision-making, but it lacks human intuition and subjective experience, making it a powerful analytical tool yet not fully equivalent to the human mind" (Kahneman, 2011).
- E. Brynjolfsson and A. McAfee (2017) argue that "artificial intelligence represents a new driver of economic growth and productivity, enabling organizations to make data-driven decisions and reshaping business models through automation and digital platforms" (Brynjolfsson & McAfee, 2017). This perspective, rooted in management and economics, views AI as a strategic tool for enhancing efficiency and decision-making by analyzing big data and predicting future trends in markets and organizations. It is also considered a pivotal factor in digital transformation and smart business models.

In this context, the researchers argue that most definitions converge around a central idea: artificial intelligence (AI) is not merely a neutral technology, but a system with deep social, economic, and psychological implications. While technically viewed as an advanced software tool, some scholars approach AI as a complex phenomenon with structural effects on society.

Depending on the discipline, AI is examined from different perspectives: in technology and engineering, the focus is on its computational capabilities and simulation of human performance; in sociology, economics, and management, it is studied in terms of its impact on power, labor markets, and growth; while in psychology and the sciences, AI is approached as a system that mimics cognitive processes without possessing consciousness or human intuition.

Within the field of library and information sciences, a discipline that intersects these broader scientific and professional domains, AI is employed to enhance information organization and retrieval, develop automated cataloging systems, provide intelligent reference services, and support professional decision-making and user behavior analysis. Thus, AI is a central tool in reshaping data management, improving service quality, and strengthening interaction between information institutions and their communities.

Based on these diverse definitions, the researchers conclude that AI in libraries and information science, like in other disciplines, comprises a set of computer systems and software capable of performing tasks typically requiring human intelligence, such as learning, reasoning, decision-making, and interacting with the environment. AI relies on machine learning and natural language processing techniques and aims to enhance human efficiency by simulating cognitive capabilities without requiring consciousness or human intuition. It is applied in various areas, including library and information sciences as part of the humanities and social sciences, where it improves automation, data classification, research acceleration, and information analysis, thereby enhancing the efficiency of information systems and knowledge management.

1.2 Characteristics of Artificial Intelligence :

Artificial intelligence (AI) is distinguished by several fundamental characteristics that explain its widespread adoption and application across various sectors, particularly in service-oriented fields such as libraries and education. The most notable of these characteristics include:

1. Self-learning from data (Machine Learning): AI systems develop autonomously by analyzing large volumes of data.
2. Simulation of human behavior: AI can perform cognitive tasks such as decision-making and reasoning.
3. Speed in processing complex and massive datasets.
4. Continuous performance improvement through feedback mechanisms.

Russell and Norvig (2021) emphasize that AI is not limited to task execution; it aims to build systems capable of interacting intelligently and adaptively with human contexts, which requires trained human resources who understand these systems and ensure their sustainability

1.3 Artificial Intelligence Importance in Libraries:

Artificial intelligence (AI) has significantly transformed service delivery and enhanced user experience, establishing itself as a key modern technology impacting libraries and information centers, similar to its effects in other economic and service sectors. Its importance in libraries lies in automating traditional tasks such as cataloging and classification, accelerating information retrieval, and providing personalized services aligned with user needs. AI systems also enable the efficient analysis of vast datasets, supporting decision-making processes within libraries. According to Hendy Abdullah Hendy Ahmed (2021، هنيدي)، AI is a pivotal tool for renewing and developing library work, offering rapid opportunities for research and innovation, including:

- Improving library service quality: Automating routine tasks allows staff to focus on more complex activities.
- Managing information overload: AI leverages data analysis and machine learning to handle massive amounts of information, ensuring fast and accurate access to relevant content.
- Supporting decision-making: Analytical tools provided by AI assist in collection development, service provision, and meeting user needs.

- Enhancing innovation in library services: AI enables services such as material recommendations based on user preferences and interactive interfaces that improve the overall user experience.

1.4 Artificial Intelligence Applications in Libraries:

The applications of artificial intelligence (AI) in libraries are diverse and have a direct impact on service quality and operational efficiency. Key areas include:

- Intelligent cataloging and classification: Utilizing machine learning techniques to analyze and organize bibliographic data, thereby improving content organization and accelerating information retrieval.
- Advanced search systems: Leveraging contextual understanding and semantic analysis to enhance search results (ص. ص. 129-131، هندي، 2021).
- Virtual assistants and chatbots: Providing immediate guidance and support to users, enhancing the overall user experience (ياسمين، 2023).
- Intelligent recommendation systems: Delivering personalized content based on users previous interests, alongside analyzing usage data to inform collection development (ياسمين، 2023).

2. AI and Competency Development in Libraries and Information Sector

2.1 professional Competencies Concept :

The concept of professional competencies has been defined in various ways across the literature, reflecting diverse disciplinary perspectives. Among the most significant definitions are the following:

- Professional competencies refer to the ability to apply knowledge, experience, and both technical and behavioral skills in daily work situations to achieve the required performance, in alignment with institutional goals and professional standards (Spencer & Spencer, 1993, p. 9) .
- -Professional competencies are a set of abilities, knowledge, and skills that enable individuals to adapt to job requirements and continuous learning, achieving effective results in a dynamic professional environment, with a focus on excellence and innovation in performance (OECD, 2005, p. 27) .
- -Professional competencies are defined as "a set of knowledge, skills, and behaviors possessed by the individual that enable him or her to perform tasks efficiently and effectively in a given work environment" (القطامي، 2017) .

In the field of library and information science, professional competencies refer to a set of core knowledge and enabling competencies developed by professionals through practice, including information and knowledge services, data analysis and retrieval, knowledge asset organization, in addition to communication, teamwork, and adaptability skills, which enhance the effectiveness of professional performance (Duran-Riquelme, Flores-Fernández, & Riquelme-Ríos, 2024).

Professional competence consists of three interrelated components:

- a. Theoretical and technical knowledge, which forms the basis for understanding work principles and applying them in changing environments.
- b. Practical and applied skills, which enable professionals to transform knowledge into tangible practices that achieve functional goals.
- c. Professional behavior and adaptability, including communication skills, teamwork, and continuous learning, ensuring that performance aligns with contextual and technological changes (Duran-Riquelme, Flores-Fernández, & Riquelme-Ríos, 2024)

2.2 Dimensions of Professional Competencies in Libraries:

Professional competencies are a central element in enhancing the performance of information and library professionals, as they integrate the knowledge, skills, and behaviors that ensure the quality and

sustainability of services (IFLA, 2012; ALA, 2009). These competencies can be classified into four key dimensions:

- Technical competencies: related to the ability of librarians to manage automated systems and databases.
- Cognitive competencies: including familiarity with knowledge structures, documentary content, and methods of organization.
- Digital competencies: linked to the use of modern software and digital platforms.

Communicative competencies: demonstrated through skills in user guidance, reference services, and collaborative teamwork.

Together, these dimensions form a comprehensive framework that enables information and library professionals to adapt to rapid technological transformations while maintaining high-quality services

2.3 AI Employing in Competency Development

Artificial intelligence (AI) technologies represent highly effective tools for supporting professional development and enhancing human competencies. They enable the design of personalized learning pathways tailored to each employees abilities and needs, ensuring effective and targeted learning. Predictive analytics further allow for the delivery of dynamic training content based on the analysis of individual performance and behavioral patterns. Through data analysis tools, AI strengthens analytical thinking and fosters data-driven decision-making, particularly within library work environments.

Shrestha et al. (2019), in their study on organizational decision-making structures in the age of AI, emphasized the importance of integrating these technologies into professional development strategies to ensure sustainable learning and continuous improvement of human resource performance.

AI thus provides multiple opportunities to support professional development through:

- Personalized learning pathways tailored to individual needs.
- Dynamic training content driven by predictive analytics.
- Enhanced analytical thinking through the use of data analysis tools in library contexts.

Nevertheless, the development of professional competencies in libraries and the information sector, in the context of digital transformation and artificial intelligence, faces several obstacles. The most significant of these include the limited availability of continuous training programs, weak investment in human capital, the absence of systematic training plans, and the lack of professional incentives, all of which hinder the sustainable development of these competencies (بن عمرة، 2023).

3. AI Mechanisms and Strategies for Professional Competency Development in Libraries and Information Sector

3.1 AI Mechanisms for Professional Competency Development

Artificial intelligence represents one of the powerful tools in the digital environment, which can be employed by university and academic library departments, as well as professional information institutions, to enhance human resource efficiency through integrated smart mechanisms and programs that contribute to the continuous and precise development of skills. Its technologies allow tracking individual performance, analyzing learning and work patterns, and subsequently designing customized training programs tailored to actual needs. Moreover, it fosters stimulating learning environments based on interaction and flexibility, thus supporting lifelong learning. In the workplace, AI improves performance quality by automating repetitive tasks and facilitating data-driven decision-making. Such intelligent deployment makes artificial intelligence a pivotal element in building human capital capable of addressing the challenges of the digital age.

- Smart recommendation systems: The study indicated that these systems rely on machine learning algorithms to provide customized training content aligned with employee needs and goals.
- Predictive data analytics: The researcher confirmed that data analysis using AI helps anticipate performance outcomes and plan proactive training interventions.
- Adaptive learning: Reference was made to the ability of AI systems to adjust learning paths according to employee interaction and learning pace.
- Intelligent assistants: The study highlighted the effectiveness of chatbots and virtual coaches in providing real-time guidance and on-the-job support.
- Simulation and augmented/virtual reality: It was explained how these technologies create highly effective training environments, particularly in technical roles.
- Sentiment and behavior analysis: The researcher addressed the role of emotion analysis technologies in enhancing employee experience and strengthening institutional engagement (الشريف، 2022، ص.ص.152-160).

3.2 AI Strategies for Professional Competency Development:

Both continuous training and AI-driven learning are considered strategic pillars for modernizing human capacities within the library environment, particularly in the shift toward smart and digital services. This approach not only focuses on knowledge transfer but also enhances professional adaptability by offering dynamic training content built upon performance analysis and continuous alignment with emerging skill requirements. Within this framework, AI systems enable the diagnosis of training needs, the customization of training pathways, and the provision of real-time feedback that contributes to improving employees actual performance.

In this context, Al-Issawi (2021) highlighted a set of effective training strategies that support this orientation, including:

- Adaptive Training Strategy: relying on AI algorithms to deliver personalized training pathways according to the learners level and progression pace.
- Data-Driven Learning Strategy: employing big data analytics to identify skill gaps and propose suitable training programs.
- Cloud-based Collaborative Training Strategy: providing open platforms for participatory training among library professionals through flexible virtual environments.
- Smart Performance Modeling Strategy: assessing the impact of training on performance indicators and automatically readjusting training programs.

The importance of this AI-based training model lies in its role as a strategic shift in the philosophy of professional development within libraries and information institutions, integrating continuous self-learning, practical field training, and the analytical intelligence of digital systems. This integrated approach enables the development of flexible competencies that adapt to rapidly changing digital environments, thereby enhancing professionals ability to manage digital transformation efficiently and effectively.

In this regard, adopting intelligent training strategies is essential, as they allow for precise analysis of training needs and the provision of personalized learning pathways grounded in data analysis and actual professional performance. Moreover, these strategies help narrow the widening gap between the evolution of technological tools and the digital readiness of human resources, through training mechanisms based on automatic adaptation to emerging needs and required skills. The impact of these strategies extends beyond short-term performance improvement to ensuring the sustainability of learning and professional

development within the institution, by creating a dynamic knowledge environment that fosters a culture of continuous learning aligned with technological and informational changes in the era of artificial intelligence.

Conclusion:

In conclusion, the integration of artificial intelligence into the library and information sector represents a strategic shift that not only enhances service quality but also drives the development of professional competencies. Beyond its technical role, AI has become a key pillar in fostering continuous learning and building adaptive human capacities in the digital age. This transformation calls for clear institutional strategies that balance technological innovation with human potential to ensure sustainable professional growth and innovation within library environments.

Recommendations:

1. Integrating specialized AI-related courses into library and information science curricula to prepare the new generation of professionals both technically and functionally.
2. Designing continuous intelligent training programs based on adaptive learning systems and professional simulations that allow for training tailored to performance and actual needs.
3. Establishing internal centers for innovation and professional development within major libraries to experiment with AI applications and assess their relevance in local contexts.
4. Encouraging professionals to engage in AI-related applied projects in libraries and promoting joint practical research between academics and practitioners.
5. Formulating clear institutional policies to ensure the integration of AI with human resources, striking a balance between technological advancement and the preservation of the human dimension of library work.

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