"Afaqfikriya" Journal

P-P…-…

ISSN: 2170-0060

EISSN:2602-5507

Professions in Libraries in the Age of Artificial Intelligence

مهن المكتبات في عصر الذكاء الاصطناعي

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Received: 23-03-2026 Accepted: 2026-04-18 Published: 2026-05-19

Abstract :

Many researchers have acknowledged the decline and disappearance of various professions following the widespread adoption of AI tools. However, AI has also brought significant positive changes to libraries, which are among the most vital information institutions. AI facilitates tasks and offers opportunities for managing and processing data that surpass human capabilities. Consequently, most libraries have hastened to adopt AI to support their knowledge and cultural missions, improve the management of their collections, and ease access to information, thus meeting user expectations.

Nevertheless, AI raises numerous questions and concerns within the information sector because it is a complex technology that requires research and expertise. This paper aims to understand how AI can influence library professions, which aspects can be beneficial, and what challenges it presents. While this is not a new issue, we as library professionals must remain vigilant and discerning in our use of AI.

Keywords: Library Professions, Historical Development, Artificial Intelligence, Challenges.

ملخص:

أقر العديد من الباحثين على زوال واختفاء العديد من المهن بعد الانتشار الواسع لأدوات الذكاء الاصطناعي، إلا انه أحدث تغيرات جذرية إيجابية في المكتبات باعتبارها من أهم مؤسسات المعلومات، مما يسهل المهام ويتيح فرص إدارة ومعالجة البيانات ربما تتجاوز العقل البشري .وعليه سارعت معظم المكتبات بتبنيها لدعم رسالتها المعرفية والثقافية لتحسين إدارة مجموعاتها وتسهيل الوصول إلى المعلومات، وللاستجابة لتوقعات مستفيديها. ومع ذلك يعتبر الذكاء الاصطناعي من الأدوات التي تثير العديد من التساؤلات والمخاوف في قطاع المعلومات كونه تقنية معقدة تستدعي البحث والكفاءة.

تهدف هذه الورقة إلى فهم كيف يمكن أن يؤثر الذكاء الاصطناعي على مهن المكتبات وماهي جوانب الاستفادة منه في الحياة المهنية وما هي التحديات التي يطرحها بالرغم من انها ليست قضية جديدة، الا أننا كمتخصصين في مجال المكتبات نحتاج الى الفطنة واليقظة في استعماله.

كلمات مفتاحية: مهن المكتبات-التطور التاريخي-الذكاء الاصطناعي-التحديات.

Introduction :

Artificial intelligence (AI) has been widely adopted by individuals to the extent that it has become an indispensable tool for finding answers to various questions and providing information without the need for specific search criteria. As libraries become intertwined with this technology, seemingly replacing traditional methods and leading to

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user disengagement, they have also rushed to adopt AI to efficiently and effectively meet their users' informational needs by automating routine processes.

AI services are numerous and can assist with organizing library data, managing borrowing processes, sorting and providing books, processing requests, delivering information to users, and enhancing search and indexing systems(Brandl Emmanuel,2024). However, AI still poses many challenges, especially with regard to its entry into the job market within the library sector, which threatens job opportunities in our profession. This raises questions about the future of our profession, such as whether roles will change and if information specialists will abandon libraries.

Thus, we can pose our central question: How can artificial intelligence affect library professions?

This question requires rigorous research and studies for a comprehensive answer. In this article, however, we aim to explore the implications of AI in the library sector and leave the discussion open for further research.

1. Historical Development of Library Professions:

Throughout history, the profession of librarianship has undergone numerous phases that have reshaped its identity, as well as its cultural and social roles. The main stages of this professional evolution are as follows: (Évolution of library and documentation professions,2018).

The first stage is the transition from the cultured, book-loving librarian whose primary role is preserving the intellectual treasures of humanity to the librarian viewed by the institution as a valuable training resource dedicated to serving and guiding the public. With the help of Eugène Morel and Paul Otlet,

librarianship and documentation became professionalized by the end of the 19th century.

The Second Stage: During this period, the profession transformed from an intellectual vocation into a more technical one that was more accessible to the public. This necessitated the organization of training programs in universities and schools, as well as the diversification of libraries (e.g., public, children's, and university).

The third stage witnessed functional transformations on social and technological fronts. These changes pertain to how information is processed, with the computerization of professions fostering greater convergence. The focus shifted toward acquiring common knowledge and competencies, and all professionals participated in adapting to this technological revolution. This convergence is evident in libraries and documentation centers.

- The Fourth Stage: The profession underwent rapid changes following the digital revolution, prompting a reevaluation of the roles and objectives of information

specialists in various documentation organizations. The adoption of digital technologies gave rise to new roles, including digital librarians and cyber documentarians. These developments have led information and documentation professionals to monitor and manage information and adopt digital archiving projects. Additionally, they disseminated multiple functional references.

The Fifth Stage: Society witnessed an increase in the production of digital data during this period. In response, information specialists developed skills in digital information management, digital mediation, and big data.

The history of library professions marks a critical evolution, from librarians as guardians of knowledge to professional information experts, following the establishment of specialized schools for managing such institutions. The librarian's role became that of an information intermediary who engages with visitors and users socially. Following the emergence of modern concepts such as digitization and artificial intelligence in the 21st century, the profession redefined its identity. Information specialists became experts in

technology, helping users find reliable sources and supporting them in their scientific and academic research.

2. Concept of Artificial Intelligence:

Due to its complex nature, there is no precise definition of artificial intelligence (AI), and researchers have yet to agree on a specific definition. According to the Larousse dictionary, AI is defined as "the set of theories and techniques used to create machines that can simulate intelligence. (Larousse Encyclopaedia).

AI is also defined as a multidisciplinary theoretical and practical field aimed at understanding the mechanisms of perception and reasoning through physical and software devices to assist or replace human activities. (Vocabulary of artificial intelligence,2018).

AI also refers to the ability of machines to perform tasks that typically require human intelligence, such as analysis, learning, and problem solving. AI encompasses areas such as machine learning and natural language processing, which enable machines to understand and generate human language.(Artificial intelligence: definition, news and issues).

Although artificial intelligence has existed for many years, its concepts remain poorly understood, while its applications have become numerous and tangible, especially in the field of information technology.(Brandl, Emmanuel,2024).

Based on the previous definitions, artificial intelligence can be defined as a complex and comprehensive concept consisting of applications and instructions designed by professionals to process data.

3. Impact of Artificial Intelligence on Library Professions:

AI offers libraries numerous opportunities, ensuring their sustainability and enhancing service quality by automating repetitive processes, improving collection management, and providing better services to users. The most affected activities include:

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Indexing:

Artificial intelligence enhances indexing by processing vast amounts of documents through the use of OCLC (More efficient cataloging thanks to AI. The digital library uses AI to suggest Dewey Decimal Classification numbers and Library of Congress subject headings to enrich descriptive indexing based on WorldCat. These suggestions are drawn from a collection of hundreds of millions of descriptive cards. Indexers can accept or reject these suggestions.

Collection Management:

AI can play a significant role in managing library resources. The French National Library (Artificial intelligence in libraries,2023), for example, uses AI to improve access to its collections. The library uses optical character recognition (OCR) tools to transcribe audio content, such as conference or interview recordings, into text. This capability is particularly beneficial for individuals with visual or hearing impairments.

Furthermore, AI enables the exploration of extensive and complex collections that would be difficult for humans to navigate. It allows for the discovery of underutilized resources and presents them to researchers (Librarians in the era of AI). AI also assists librarians in promoting various sources based on specific topics and creating summaries for books to attract readers and encourage borrowing.

This technological tool improves user services by enabling individuals who don't know the title or author of a book to use chatbots to find the information they need.

Media and Information Literacy:

This function enhances users' digital autonomy and trains them in information skills to adapt to their research needs. With the rise of fake news and media channels promoting hate speech, many organizations, including UNESCO, advocate for media and information literacy to confront 21st-century challenges and digital innovations, particularly artificial intelligence (AI).

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AI can provide users with a variety of services, such as facilitating access to reliable information sources and distinguishing misleading information. Developing tools to detect fake news is a complex task that requires specific software. For instance, the Media Bias platform uses AI to evaluate political bias in the media and analyze sources.

Libraries offer generative AI and explain its mechanisms, applications, and limitations. With librarian guidance, users can use these tools to create content, such as articles, videos, and images. Furthermore, libraries view themselves as a bridge between these tools and individuals. They foster critical thinking, raise awareness about various biases, combat fake news and deep fakes (Librarians in the era of AI), reduce the digital divide, ensure respect for scientific integrity and citation rules, protect data confidentiality, address copyright issues, assist with writing, and consider environmental aspects (Prongué, Nicolas).

4.Competencies of Library Professionals in the Field of Artificial Intelligence:

In the current era, competencies are critically important for adapting to changing professional contexts and understanding new AI practices. Numerous studies have been conducted in this field to disseminate the competencies that professionals need to possess to meet the complex needs of users, especially since libraries have experienced a decline in engagement.

Skip Prichard (Significant advances), president and CEO of an online digital library, stated that understanding metadata standards enhances AI in indexing operations, resource sharing, and enriching metadata. This makes libraries more efficient, accurate, and responsive to community needs.

According to Antonin Benoit (Lecinas,Public Libraries in the AI), the required skills belong to various technical domains, including language modeling, programming languages, ethics, and algorithms. These competencies include:

Integrated Database Management (SIGB): Tools that allow for managing collections, loans, acquisitions, and integrated data systems.

- Digital literacy: Library professionals play a crucial role in helping users navigate the internet, evaluate the reliability of sources, and use digital tools.

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- Digital mediation: This includes creating online content, managing social networks, and organizing workshops to raise public awareness of technology.

- Technological monitoring: Specialists must stay informed about innovations to adapt their services and tools according to user expectations (Librarians Competencies).

Additionally, the Arab Information Union published the Guideline for AI Skills for Information Professionals, which distinguishes two main categories: professional competencies and soft skills (personal attributes). These can be summarized in the following table: (Nahida Qamouh,et al.2024).

Hard skills (technical/professional competencies):	Hard skills (technical/professional competencies):
1. Content creation and organization	1. Information and digital literacy skills

1.1 Digital content development Using emerging tools and technologies to create accessible digital content - Formatting and producing digital content appropriately Creating digital content that supports ideas and opinions 1.1.4 Analyze digital content using the Internet of Things (IoT). 1.2 Content Integration and Repurposing 1.2.1 Create infographics using emerging applications. 1.2.2 Using emerging applications to improve content accessibility 2. Information Security Skills 2.1 Protecting Devices and Equipment 2.1.1 Understanding the principles of digital rights management Smart Management of Intellectual Property Rights Controlling mechanisms to protect devices and networks 2.1.4 Implementing a cybersecurity strategy 2.1.5 Avoiding Deepfake Manipulation 2.2 Personal Data Protection and Privacy 2.2.1 Recognizing suspicious email messages (phishing). 2.2.2 Applying security measures for online payment processes 2.2.3 Safely Using Smartphone Applications 2.2.4 Recognizing user experience privacy techniques 3. Digital Problem-Solving Skills 3.1 Collaborative problem solving 3.1.1 Working with others to solve digital problems 3.2 Technical Troubleshooting 3.2.1 Identify and resolve problems with technical devices.	1.1Browsing, searching, and filtering digital data, information, and content 1.1.1Identifying the need for data, information, and digital content 1.1.2Accessing data, information, and digital content 1.1.3Understanding and Using Data, Information, and Digital Content 1.2Evaluating and Analyzing Data, Information, and Digital Content 1.2.1Analyze data, information, and digital content. 1.2.2Big Data Analysis Skills 1.2.3Critically assessing the accuracy and credibility of data, information, and digital content 1.2.4Comparing data, information, and digital content 1.2.5Interpreting data, information, and digital content 1.3Managing Data, Information, and Digital Content 1.3.1Organizing, storing, and retrieving data, information, and digital records 1.3.2Processing and Organizing Data, Information, and Digital Content 1.3.3Operating semantic web algorithms (intelligent search). 2.Communication and Collaboration Skills 2.1Interacting through digital technologies 2.1.1Effective Communication Using Digital Tools 2.1.2Using Digital Tools for Informal Communication 2.1.3Interacting with intelligent applications and systems 2.1.4Providing feedback to AI systems 2.2Participating Through Digital Technologies 2.2.1Sharing and Presenting Information 2.2.2Sharing Content and Restricting Access

3.2.2 Diagnosing and repairing issues 3.2.3 Finding Online Solutions When Facing Technical Problems 3.3 Identifying Technological Needs 3.3.1 Using the Internet for Commercial Transactions 3.3.2 Using machine translation tools and real-time translation apps. Selecting assistive tools to access information and online content 3.4 Using digital technology creatively 3.4.1 Using digital technology to develop businesses or products. Identifying digital spaces that can be used for projects 3.4.3 Participating in the solution of social problems with digital solutions 3.5 Identifying Gaps in Digital Competencies 3.5.1 Obtaining reliable feedback on digital competence 3.5.2 Reflect on your level of digital competence.	2.2.3Publishing content on content-sharing platforms 2.2.4Recognizing Misinformation 2.3Promoting Citizenship Through Digital Technologies 2.3.1Obtaining Digital Credentials for Secure Electronic Identification 2.3.2Identifying Areas to Benefit from Artificial Intelligence 2.3.3Interacting with Others via Digital Technologies to Advance Sustainable Development 2.4Collaborating Through Digital Technologies 2.4.1Using digital tools to share tasks and responsibilities collaboratively 2.4.2Using digital tools to facilitate and improve collaborative processes 2.4.3Using digital tools and techniques for remote work 2.5Digital Ethics Skills 2.5.1Managing Emotions When Communicating with Others Online 2.5.2Recognizing Hostile or Abusive Online Activities 2.5.3Understanding Online Privacy and the Need to Protect Personal Data 2.6Digital Identity Management Skills 2.6.1Creating and Managing Personal Profiles in Digital Data Environments 2.6.2Adopting information and communication practices to build a positive digital identity 2.6.3Conducting searches in online environments 2.6.4Verifying and Modifying Metadata Types to Protect Privacy 2.6.5 Understanding Strategies for Controlling and Managing Data by Online Systems

Table Prepared by the Researcher

We consider this valuable study a scientific contribution to the field of libraries. It advocates for the necessity of professionals possessing the

aforementioned competencies in this role. This is essential for adapting to

contemporary needs, especially those concerning artificial intelligence, and for addressing the challenges posed by this technology. This ensures that AI does not hinder our activities and that we can manage it effectively. However, acquiring these competencies requires effort and expertise in information technology, especially when integrating AI systems into our work environment.

In this context, Emmanuel Brandl (Brandl Emmanuel,2024)emphasized the need for library professionals to adapt to and lead change by demonstrating new traits, focusing on productivity, educational skills, communication, increasing technical expertise, embracing job diversity, and maintaining a user-focused approach.

According to Reybald Chapuis, three criteria accompany professions to make them complementary to AI:(Chapuis, Reynald. The Impacts of Artificial Intelligence on Employment,2018).

- Adapting education and training by aligning it with the job's ecosystem in the case of change. To succeed, we must value soft skills (personal competencies) more than hard skills.

- Flexibility in work pace: Workers still have a competitive advantage over machines when it comes to social interactions, flexibility, and adaptability.

- Social Acceptance of Automation: Technological breakthroughs have led to job creation, making it difficult to predict the emergence of future jobs. The challenge for businesses and governments is to facilitate the acquisition of new skills and professional trends.

In the current technological era, individuals must possess the competencies to use AI and enhance their professional capacities. This requires developing these skills through new training strategies for library professionals.

To address the risks associated with artificial intelligence, library professionals must:(Artificial intelligence in the documentary information ecosystem).

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Confront challenges regarding the protection of privacy and personal data.

Address issues related to the risk of bias in data analysis and processing by reviewing analytical proposals and data provided by AI and utilizing information evaluation skills before disseminating it to users.

- Tackle challenges related to the transparency of automated processes.

Conclusion:

As researchers, artificial intelligence prompts us to explore whether it will lead to the decline of library professions or serve as a tool to help us develop and enhance our profession and improve the services we provide to users. Many studies have suggested that AI will cause the disappearance of many jobs.

Despite the opportunities AI offers in processing and disseminating information, it cannot replace library professionals. Therefore, professionals must develop their skills and acquire the knowledge necessary to effectively integrate these tools into the work environment. This commitment to professional growth ensures the continued relevance of library roles and enhances the quality of information services in the digital age.

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