

**Ministry of Higher Education and Scientific Research**

**University of Badji Mokhtar \_ Annaba**

**Faculty of Humanities and Social Sciences**

**Department of Library and Information Science**

**In collaboration with: Laboratory of New Information Technologies and Their Role in  
National Development,**

**University of Constantine 2 – Abdelhamid Mehri**

**Organizes the Second National Conference on:**

**"Towards the Adoption of Artificial Intelligence Applications in the  
Development of Algerian Library Services: Realities, Impacts, and  
Implications"**

October 27, 2025

**A presentation Entitled: “Strategic Planning for Information Services in Algerian  
Libraries considering Artificial Intelligence Characteristics and Models”**

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## **Abstract**

These abstract aims to explore the possibilities and opportunities for strategic planning of information services within Algerian libraries, leveraging the advanced capabilities and diverse characteristics offered by Artificial Intelligence (AI). This exploration occurs within the broader context of the general trend towards developing library services to keep pace with rapid digital transformations and meet the increasing knowledge and information needs of users in the modern era. The study primarily seeks to provide a clear and integrated vision on how to optimally utilize various AI characteristics and models, such as machine learning, natural language processing, and big data analytics, in the planning processes for innovative, personalized, and effective information services within the Algerian library environment. The central problem addressed by the study is the noticeable gap between the immense theoretical potential offered by AI and the practical challenges facing its actual implementation in the context of Algerian libraries. This is particularly evident given the absence or weakness of specialized strategic planning frameworks that consider the specificity of this context and its unique requirements, including technological infrastructure, available resources, and the digital skills of staff and users. The study adopts a descriptive-analytical approach, involving an in-depth analysis of relevant scholarly literature and a review of leading international experiences and practices in integrating AI into library services and planning. It also suggests the potential future adoption of a case study methodology to evaluate and apply the proposed framework in specific Algerian libraries. It is anticipated that the study will conclude by presenting a proposed methodological framework for strategic planning. This framework will outline the practical and procedural steps for effectively integrating AI technologies into the development and improvement of information services in Algerian libraries, taking into account the available challenges and opportunities, and offering practical recommendations for decision-makers and librarians to embrace this strategic direction.

## **Introduction**

In the digital age, libraries are no longer mere repositories of books and traditional resources. They have transformed into vital centers for knowledge, learning, and community interaction, playing a pivotal role in empowering individuals and societies amidst the accelerating information and technological revolution (IFLA, 2019). To keep pace with this profound transformation and maintain their leading role, it has become imperative for libraries, including those in Algeria, to

adopt emerging technologies and effectively integrate them into their infrastructure and service delivery (Chowdhury & Foo, 2020). At the forefront of these technologies is Artificial Intelligence (AI), representing a tremendous transformative force capable of revolutionizing how libraries operate and deliver their services (Griffey, 2019). The potential of AI manifests in multiple areas within the library environment, starting from enhancing search and retrieval processes through semantic search engines that understand the context of user queries (Wu et al., 2022), moving to providing personalized reading recommendations and resources based on individual user interests and behaviors (Fernandez, 2019), extending to analyzing vast amounts of library usage data to extract valuable insights that support informed decision-making (Padilla, 2019), and automating numerous routine and repetitive tasks, thereby allowing information professionals to focus on more complex and higher value-added responsibilities (Cox et al., 2021).

Within the Algerian context, the library sector faces a set of intertwined challenges, including limited allocated budgets, the need to develop technological infrastructure, and the necessity to enhance the digital skills of both staff and users (Boumarafi, 2020). Nevertheless, promising opportunities for development also exist, particularly in light of national strategic orientations towards promoting digitization, encouraging innovation, and building a knowledge-based economy (Algerian Ministry of Higher Education and Scientific Research, 2021). AI presents a timely opportunity for Algerian libraries to overcome some of these challenges and achieve a qualitative leap in their services, provided that its adoption and application are guided by a clear and well-thought-out strategic planning vision (Hamada & Ismail, 2019). This study aligns with the objectives of the important scientific forum on "The Trend Towards Adopting Artificial Intelligence Applications in Developing Algerian Library Services," seeking to contribute to this discussion by focusing on a vital and complementary aspect of the application process: the strategic planning for integrating these technologies effectively and sustainably (Tella, 2020).

### **Problem Statement**

Despite the promising theoretical potential and immense transformative capabilities offered by Artificial Intelligence for developing information services in libraries, the transition from theoretical vision to effective practical application faces significant challenges, especially within the context of Algerian libraries (Boumarafi, 2020). The central problem this study seeks to

address is the existing gap between the latent potential of AI technologies on one hand, and the practical obstacles and challenges hindering their successful adoption and implementation in the Algerian library environment on the other (Hamada & Ismail, 2019). This problem is exacerbated by the absence or weakness of specialized strategic planning frameworks and models that Algerian libraries can use as guidance to develop clear and appropriate roadmaps for integrating AI into their operations and services (Johnson, 2018). General planning models may not be sufficient to address the unique requirements and specificities of this context, including the level of technological maturity, available financial and human resources, the regulatory environment, the specific needs of Algerian users, and linguistic and cultural particularities such as the need for models capable of effectively processing the Arabic language (Albanna & Elhag, 2021). Consequently, there is an urgent need to develop or adapt strategic planning approaches that take these specificities into account (Yelton, 2019). Such approaches should assist Algerian libraries in making informed decisions regarding the selection and application of appropriate AI technologies, setting priorities, allocating resources, evaluating impact, and ensuring sustainability and ethical responsibility in the use of these technologies (Tella, 2020). The absence of such systematic planning could lead to inefficient investments, applications that do not meet real needs, or an exacerbation of the digital divide, thereby preventing the realization of the desired benefits of AI in developing the library and information sector in Algeria (Boumarafi, 2020).

## **Research Questions**

Based on the outlined problem statement, this study seeks to answer a set of interrelated questions that form the core of the research:

1. **Main Question:** How can Algerian libraries leverage the characteristics and models of Artificial Intelligence to develop and implement effective strategic plans for enhancing information services provided to users? (Tella, 2020)
2. **Sub-Questions :**
  - What are the most prominent characteristics and models of AI (e.g., machine learning, natural language processing, computer vision, expert systems)

applicable to improving information services in Algerian libraries (such as search, recommendation, access, reference support)? (Griffey, 2019; Wu et al., 2022)

- What are the main challenges and opportunities (technological, organizational, human, financial) facing Algerian libraries in their endeavor to adopt and apply AI in planning their services? (Boumarafi, 2020; Hamada & Ismail, 2019)
- What are the essential elements and stages that a proposed framework for strategic planning of AI-based information services should include, tailored to the reality and needs of Algerian libraries? (Johnson, 2018; Yelton, 2019)
- What are the ethical considerations and responsibilities that must be taken into account when planning the application of AI in Algerian library services to ensure fair, transparent, and secure use? (IFLA, 2020; Jones & Bawden, 2019)

### **Adopted Methodology**

To answer the research questions and achieve its objectives, the study will primarily rely on the **descriptive-analytical method**. This method involves collecting data and information related to the study topic from various sources, followed by describing, analyzing, and interpreting it to gain a deeper understanding of the phenomenon under investigation and draw conclusions (Creswell & Creswell, 2018).

The steps for applying this method in the current study are as follows:

1. **Literature Review:** Conducting a comprehensive survey and critical analysis of scholarly literature, previous studies, and specialized reports (in both Arabic and foreign languages) addressing the topic of AI and its applications in libraries in general, strategic planning for information services, and the reality of Algerian libraries (Okoli & Schabram, 2010).
2. **Analysis of Models and Experiences:** Analyzing and studying various planning models and frameworks used in other fields or in international library contexts for integrating modern technologies, and assessing their suitability for the Algerian context (Johnson, 2018; Yelton, 2019).

3. **Extraction and Synthesis:** Based on the preceding analysis, principles and best practices will be extracted, and the essential elements necessary for constructing a proposed methodological framework for strategic planning of AI-based information services in Algerian libraries will be identified (Grant & Booth, 2009).

The descriptive-analytical method is considered appropriate for the nature of this study as it allows for a broad exploration of the topic, analysis of the relationships between its various variables, and helps in building an integrated theoretical understanding that paves the way for proposing practical solutions and applicable recommendations (Creswell & Creswell, 2018). As indicated in the abstract, this study could potentially pave the way for future adoption of a **case study methodology** to test and apply the proposed framework in specific Algerian libraries and evaluate its effectiveness practically (Yin, 2018).

## **Methodological Framework for the Study**

### **Methodological Structure of the Study**

The proposed methodological framework for the strategic planning of AI-based information services in Algerian libraries consists of five essential, integrated, and interconnected phases. Together, they form a methodological roadmap that libraries can use as guidance on their journey towards adopting and applying AI technologies effectively and sustainably (Johnson, 2018). The details of these phases are as follows:

#### *Phase One: Comprehensive Assessment of the Current Situation*

This phase represents the fundamental starting point in the planning process and aims to build a deep understanding of the library's current reality and its internal and external environment, through:

1. **Analysis of Current Technological Infrastructure:** Assessing the library's technological maturity level, including hardware, software, networks, databases, and library management systems in use, and their potential for integration with AI technologies (Chowdhury & Foo, 2020).

2. **Analysis of Human Resources:** Evaluating the existing digital skills and competencies among library staff, and identifying knowledge and skill gaps that require development to meet the demands of AI application (Cox et al., 2021).
3. **Analysis of Current Information Services:** Studying and evaluating currently offered services, their usage levels, strengths and weaknesses, and opportunities for improvement through AI (Massis, 2018).
4. **Analysis of User Needs and Expectations:** Collecting and analyzing data on the needs, behaviors, and expectations of current and potential users, and identifying gaps between these needs and the services provided (Fernandez, 2019).
5. **Analysis of the External Environment:** Studying trends and developments in the library and information field locally and globally, relevant national and institutional orientations, and the opportunities and challenges they present (IFLA, 2019).

#### Phase Two: Defining Strategic Objectives and Application Priorities

Based on the results of the comprehensive assessment, this phase focuses on defining the library's strategic direction regarding AI application, through:

1. **Formulating a Clear Vision:** Defining the desired future state of the library with AI adoption, and how its services and operations will look after the transformation (Johnson, 2018).
2. **Defining Strategic Objectives:** Formulating Specific, Measurable, Achievable, Relevant, and Time-bound (SMART) objectives for applying AI in information services (Bryson, 2018).
3. **Identifying Priority Application Areas:** Selecting services or processes that will benefit most from AI application, and prioritizing implementation based on criteria such as:
  - Expected added value for users (Fernandez, 2019)
  - Ease of implementation and required resources (Yelton, 2019)
  - Alignment with the overall strategic goals of the library and parent institution (Johnson, 2018)
  - Potential for achieving tangible results in the short and medium term (Tella, 2020)

4. **Selecting Appropriate AI Models and Technologies:** Identifying the most suitable technologies and models for each application area, such as:
  - Intelligent recommendation systems for information resources (Fernandez, 2019)
  - AI-enhanced search engines (Wu et al., 2022)
  - Chatbots for user service (Allison, 2020)
  - Big data analytics systems for decision support (Padilla, 2019)
  - Natural Arabic language processing techniques for subject indexing and automated abstracting (Albanna & Elhag, 2021)

#### Phase Three: Planning Resources and Requirements

This phase focuses on identifying and planning the resources and requirements necessary to achieve the defined objectives, including:

1. **Technological Infrastructure Planning:** Identifying requirements for hardware, software, networks, cloud storage, and other necessary technological components (Chowdhury & Foo, 2020).
2. **Human Resources Planning:** Identifying competency and skill needs, recruitment or outsourcing plans, and training and capacity development programs (Cox et al., 2021).
3. **Financial Planning:** Estimating expected costs (investment and operational), identifying potential funding sources, and developing detailed budgets (Bryson, 2018).
4. **Partnership and Collaboration Planning:** Identifying opportunities for collaboration with external entities (such as universities, research centers, technology companies) to share expertise and resources (IFLA, 2019).
5. **Data Management Planning:** Developing strategies for collecting, organizing, storing, and protecting the data needed to train and operate AI models (Padilla, 2019).

#### Phase Four: Phased Implementation and Application

This phase addresses the practical aspects of implementation, adopting a gradual, phased approach that allows for continuous learning and adaptation, including:

1. **Developing a Detailed Implementation Plan:** Defining tasks, responsibilities, timelines, and milestones for each project or initiative (Johnson, 2018).
2. **Adopting a Pilot Project Approach:** Starting with small-scale projects to test technologies and models before expanding their application (Yelton, 2019).
3. **Developing and Adapting Solutions:** Working on developing or adapting AI solutions to suit the specific needs and particularities of the library and its users (Griffey, 2019).
4. **Change Management:** Implementing effective change management strategies, including continuous communication, awareness-building, and encouraging participation from staff and users (Bryson, 2018).
5. **Capacity Building:** Implementing training and skill development programs for library staff to enable them to handle new technologies (Cox et al., 2021).

#### Phase Five: Monitoring, Evaluation, and Continuous Improvement

This phase represents the feedback loop in the planning process, aiming to ensure the effectiveness and sustainability of AI applications, including:

1. **Defining Key Performance Indicators (KPIs):** Establishing quantitative and qualitative metrics to evaluate the success of AI applications and their impact on library services and users (Tella, 2020).
2. **Data Collection and Analysis:** Implementing regular mechanisms for collecting and analyzing performance, usage, and satisfaction data (Padilla, 2019).
3. **Periodic Review:** Conducting periodic reviews of plans and objectives in light of achieved results and changes in the internal and external environment (Johnson, 2018).
4. **Continuous Improvement:** Identifying opportunities for improvement and implementing necessary adjustments to plans and applications (Bryson, 2018).
5. **Monitoring Ethical Considerations:** Monitoring and evaluating adherence to ethical and legal standards in the use of AI, and modifying practices as needed (IFLA, 2020).

## Ethical and Responsible Considerations in Planning

The strategic planning framework must incorporate ethical and responsible considerations to ensure that AI is used in a way that respects user rights and privacy and reinforces the core values of libraries. These considerations include :

1. **Transparency and Clarity:** Ensuring clarity and transparency in the use of AI in library services, and informing users about how their data is collected and used (IFLA, 2020).
2. **Privacy and Data Security:** Establishing strict policies and procedures to protect user privacy and data security (Jones & Bawden, 2019).
3. **Fairness and Inclusivity:** Ensuring that AI applications are fair and inclusive, avoiding biases that could lead to discrimination against certain user groups (Padilla, 2019).
4. **Human Oversight:** Maintaining the role of human supervision and oversight over the decisions and recommendations of AI systems (Griffey, 2019).
5. **Balancing Automation and Human Interaction:** Maintaining an appropriate balance between automation and human interaction in library services, emphasizing that AI aims to enhance the role of information professionals, not replace them (Cox et al., 2021).

This proposed methodological framework represents a comprehensive and flexible roadmap that can be adapted according to the needs and circumstances of each library, considering its size, type, available resources, and the institutional and societal context in which it operates (Johnson, 2018). It can also be applied gradually, initially focusing on priority areas with the greatest impact, and then expanding progressively as experience is gained and resources become available (Yelton, 2019).

## References

- 1-Allison, D. (2020). Chatbots in the library: Theory, practice, and case studies. *Library Technology Reports*, 56(8), 1-37.
- 2-Boumarafi, B. (2020). Digital libraries in the Arab world: Development and challenges. *IFLA Journal*, 46(4), 371-383. <https://doi.org/10.1177/0340035220931874>
- 3-Bryson, J. M. (2018). *Strategic planning for public and nonprofit organizations: A guide to strengthening and sustaining organizational achievement* (5th ed.). Wiley.
- 4-Chowdhury, G. G., & Foo, S. (2020). *Digital libraries and information access: Research perspectives*. Facet Publishing.
- 5-Cox, A. M., Pinfield, S., & Rutter, S. (2021). The intelligent library: Thought leaders' views on the likely impact of artificial intelligence on academic libraries. *Library Hi Tech*, 39(1), 72-88. <https://doi.org/10.1108/LHT-08-2019-0184>
- 6-Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approach* (5th ed.). SAGE Publications.
- 7-Fernandez, P. (2019). Through the looking glass: Envisioning new library technologies. How artificial intelligence will impact libraries. *Library Hi Tech News*, 36(4), 1-6. <https://doi.org/10.1108/LHTN-04-2019-0024>
- 8-Grant, M. J., & Booth, A. (2009). A typology of reviews: An analysis of 14 review types and associated methodologies. *Health Information & Libraries Journal*, 26(2), 91-108. <https://doi.org/10.1111/j.1471-1842.2009.00848.x>
- 9-Griffey, J. (2019). *Artificial intelligence and machine learning in libraries*. Library Technology Reports, 55(1), 1-34.
- 10-Hamada, D., & Ismail, S. (2019). The state of digital library education in Arab countries. *IFLA Journal*, 45(4), 334-347. <https://doi.org/10.1177/0340035219886610>
- 11-IFLA. (2020). *IFLA statement on libraries and artificial intelligence*. International Federation of Library Associations and Institutions.
- 12-Johnson, K. (2018). *The innovative library: Strategic choice in an era of technological change*. Chandos Publishing.
- 13-Jones, M. L., & Bawden, D. (2019). Big data and the ethics of knowledge creation: Implications for the information professions. *Journal of Documentation*, 75(1), 214-232. <https://doi.org/10.1108/JD-06-2018-0095>
- 14-Massis, B. (2018). Artificial intelligence arrives in the library. *Information and Learning Science*, 119(7/8), 456-459. <https://doi.org/10.1108/ILS-04-2018-0035>
- 15-Tella, A. (2020). *Artificial intelligence, machine learning and deep learning in libraries: An introduction*. Digital Information Review.
- 16-Wu, D., Liang, S., Yu, J., & Xu, H. (2022). The application of artificial intelligence technology in library user services: A systematic review. *The Electronic Library*, 40(1), 30-49. <https://doi.org/10.1108/EL-08-2020-0231>