Journal of Scientometric Research, 2026; 15(3):1049-1061.
https://www.jscires.org

Research Article

Artificial Intelligence and Information Ethics in Jordanian Government Academic Libraries: Reality and Challenges

Serhan Ahmed Al-Tawalbeh*

Department of Library and Information, College of Art, Al-Hussein Bin Talal University, Maan, JORDAN.

ABSTRACT

This study set out to examine how artificial intelligence is currently being employed in Jordanian government academic libraries, and to look closely at the ethical questions that come with that employment, particularly around three areas: the contribution of artificial intelligence to developing library services, the extent of commitment to information ethics and privacy, and the institutional and technical obstacles standing in the way of wider adoption. The descriptive-analytical approach was adopted for this purpose. A questionnaire covering these three areas was built and distributed to a random sample of (137) employees drawn from a total population of (258) employees across Jordanian government academic libraries, a sample that made up (53.1%) of the population. Results indicated that the role artificial intelligence currently plays in improving library services is still moderate (mean=3.154), and that commitment to information ethics and privacy likewise falls at a moderate level (mean=3.318), with legal accountability and intellectual-property protection drawing somewhat more attention than transparency and algorithmic neutrality. The challenges axis came out highest of the three (mean=3.638), driven mainly by staff resistance to new technologies and unease over a shrinking human role in decision-making. None of the differences across gender, age group, educational level, or years of experience reached statistical significance, suggesting these perceptions are broadly shared across staff regardless of their personal or professional background. In light of these results, the study recommends that library administrations put in place a clear code of ethics for artificial-intelligence use, invest in dedicated staff training, and move forward through small pilot projects before any large-scale rollout, while urging the Ministry of Higher Education to issue a unified national framework for artificial-intelligence ethics across academic institutions.

Keywords: Artificial Intelligence, Information Ethics, Privacy, Academic Libraries, Jordan, Algorithmic Bias.

Correspondence:
Serhan Ahmed Al-Tawalbeh
Department of Library and Information, College of Art, Al-Hussein Bin Talal University, Maan-71111, JORDAN.
Email: satwlbh@yahoo.com
ORCID: 0000-0003-1406-0955

Received: 16-07-2026;
Revised: 06-08-2026;
Accepted: 24-10-2026.

INTRODUCTION

The world is currently witnessing a radical transformation in the way knowledge is produced, managed, and distributed, with artificial intelligence taking center stage as the main driving force behind this transformation. In essence, academic libraries find themselves facing a very delicate equation: taking advantage of unprecedented technological capabilities, versus ethical challenges that are no less profound than the technical challenges themselves. The library is no longer just a repository of information, but has become an interactive environment that collects and analyzes user data and builds its services on it. This raises fundamental questions about privacy, transparency, and accountability.

Yaroshenko & Iaroshenko (2023) confirmed that artificial intelligence tools represent enormous potential to propel academics and librarians to new heights; however, privacy and bias are clear examples of ethical considerations that must be taken into account when adopting these technologies. This view intersects with Resnik & Hosseini's (2025) definition of artificial intelligence as a system of technologies capable of performing tasks that require perception, reasoning, and decision-making-capabilities that necessarily require an ethical framework governing their use.

This issue takes on added importance in the context of Jordanian government academic libraries, where the requirements of institutional modernization intersect with limited resources and the absence of clear policies regulating the ethical use of artificial intelligence. In this context, the academic library not only faces a technical challenge, but also the responsibility of protecting the intellectual freedom of its users, preserving their data, and ensuring fair access to information without discrimination or algorithmic bias.

OPEN ACCESS

Manuscript TECHNOMEDIA

DOI: 10.5530/jscires.20260435

Copyright Information :
Copyright Author (s) 2026 Distributed under Creative Commons CC-BY 4.0

Publishing Partner : Manuscript Technomedia. [www.mstechnomedia.com]

Based on this problem, this study seeks to provide a comprehensive field assessment of the reality of employing artificial intelligence in Jordanian government academic libraries, through three integrated axes: The role of artificial intelligence in developing library services, the ethical risks associated with this employment, and the challenges to accessing reliable information. This study is based on a descriptive-analytical approach using a questionnaire, with the aim of understanding the dimensions of the phenomenon both quantitatively and qualitatively, and arriving at results that can be generalized and applied in formulating more informed and ethically committed library policies.

Relevance to the Scope of Scientometric Research

Although the present study adopts a survey-based rather than a bibliometric design, it speaks directly to a concern raised repeatedly within the scientometric literature on artificial intelligence: that quantitative mapping of AI-related scholarly output needs to be complemented by empirical, adoption-level evidence from the institutions in which this knowledge is actually put to use. Pandey, Verma and Shukla (2021), publishing in this journal, traced the scientific productivity of AI research in India and pointed to the need for closer attention to how such research translates into institutional practice. Likewise, Makhashen and Al-Jamimi (2023) examined machine-learning-based prediction within a digital-library and citation-analysis context, underscoring the practical stakes that AI adoption carries for library and information infrastructures. By assessing how artificial intelligence is actually employed, and ethically governed, within Jordanian government academic libraries, the present study extends this line of inquiry from the measurement of AI-related scholarly production toward the institutional and ethical conditions shaping AI's practical uptake in library and information science - a science-policy dimension central to the broader scientometric research agenda. This concern with the responsible and ethical use of AI is one this journal has continued to engage with directly: Madegowda (2025) reviewed the ethical dilemmas AI tools introduce into academic publishing itself, while Das (2021), reviewing Kirchschläger's work on digital transformation and ethics, underscored that responsible AI requires grounding ethical principles such as accountability and human rights in concrete institutional practice - precisely the kind of grounding the present study provides for the library setting.

The importance of the study

This study derives its importance from the intersection of two highly influential axes in the contemporary information landscape: The rapid expansion in the use of artificial intelligence technologies within academic libraries on the one hand, and, on the other hand, there is a growing ethical problem associated with this type of employment. This importance is manifested on two complementary levels:

First: theoretical importance

This study contributes to enriching the Arabic scientific literature in the field of artificial intelligence ethics in libraries. This is a field that remains under-researched at the local and regional levels compared to its Western counterpart. It also provides an analytical framework that links three dimensions that are rarely studied together in a single study: Operational efficiency, information ethics, and institutional challenges. This deepens the theoretical understanding of the nature of the relationship between technology and values in the library environment.

Second: Practical importance

This study gains direct field importance as it specifically targets Jordanian government academic libraries, in the absence of national studies that diagnose the reality of these libraries and measure their level of ethical awareness towards artificial intelligence applications. It is hoped that its results will provide a reliable database to help decision-makers and library administrations formulate clear policies that strike a balance between leveraging the advantages of artificial intelligence in automating services and improving the user experience, and between data privacy and ensuring the integrity of information and fair access to it, free from any algorithmic bias.

Study questions: This study sought to answer the following research questions

1- What is the role of artificial intelligence in improving the services of government academic libraries in Jordan?

2- What is the level of impact of artificial intelligence on information ethics and privacy in government academic libraries in Jordan?

3- What level of challenges do government academic libraries in Jordan face in employing artificial intelligence technologies?

4- Are there statistically significant differences at the significance level of ($\alpha \leq 0.05$) in the level of the role of artificial intelligence, information ethics, and challenges according to personal variables (Gender, age group, educational level, years of experience)?

Study objectives. This study sought to achieve the following objectives

1- Measuring the level of use of artificial intelligence technologies in improving the services of government academic libraries in Jordan from the perspective of their employees.

2- Discovering the level of commitment to information ethics and privacy protection when using artificial

intelligence applications in Jordanian government academic libraries.

3- Identifying the most prominent institutional, technical, and ethical challenges that hinder the use of artificial intelligence in Jordanian government academic libraries.

4- To determine whether there are statistically significant differences in the responses of the sample members attributable to personal and functional variables.

Theoretical framework

Artificial intelligence today represents one of the most influential technological shifts in the structure and management of human knowledge. Its role is no longer limited to processing and analyzing data; it has expanded to include decision-making, anticipating needs, and producing content-functions that were previously the exclusive domain of the human mind. In the specific context of academic libraries, this transformation is evident in the shift from traditional processes such as cataloging, classification, and retrieval toward intelligent systems capable of continuously learning and adapting to users' needs. Since artificial intelligence is one of the fundamental pillars upon which the technology industry and digital transformation in the current era are built, it enables computers to emulate human tasks such as thinking and learning from previous experiences (Mourad, 2025). This, in turn, opens up broad prospects for academic libraries to develop their services and enhance their operational efficiency (Manjunatha, 2023).

However, this transformation is not without profound ethical complexities that require careful study and scrutiny. One of the most prominent issues concerns privacy, since AI systems rely on collecting vast amounts of users' personal data and analyzing them, which raises serious questions about the limits of such collection and the safeguards associated with it. UNESCO (2019) has emphasized the need to handle this data in accordance with international law and established privacy regulations, considering privacy to be a fundamental pillar for preserving human dignity and freedom of thought.

Alongside privacy, transparency and accountability also emerge as pressing concerns. Many AI systems operate based on complex algorithms that are difficult for the average user to understand or verify, making their decisions hard to review and audit. Narendra *et al*. (2025) argue that libraries are required to adopt explainable and reviewable AI systems, and to establish clear mechanisms of accountability in cases of error or when negative effects occur for users. In addition, there is the issue of algorithmic bias identified by Sahnoun and Balash (2024), which they describe as a reflection of the social biases embedded in training data. This may lead to unreliable or discriminatory outcomes in certain contexts.

Regarding information ethics and copyright, libraries face an intricate system of principles and values that govern the collection, storage, and use of information-at a direct intersection with intellectual property protection laws, which are now encountering unprecedented challenges in light of AI's ability to generate content and reuse it (Ali, 2024). SAP (2024) defines AI ethics as the principles that govern its behavior from the perspective of human values, including privacy, transparency, accountability, security, fairness, and the potential social impacts. These principles all intersect with the mission of the academic library in serving and preserving knowledge.

Therefore, academic libraries are not faced with a purely technical challenge; rather, they bear a comprehensive ethical responsibility that calls for the development of clear strategies to ensure that AI is used in ways that serve users, protect their rights, and strengthen their trust in the information institution they rely on.

Previous studies

A number of studies have addressed the relationship between artificial intelligence and information ethics in the library environment. The following is a review of the most prominent ones, arranged according to a cumulative logic that begins with studies focusing on opportunities and applications, and progresses toward those that deepen the ethical and analytical dimension.

Joel's (2025) study examined the reality of adopting artificial intelligence in academic libraries in the north-east of Nigeria, targeting 500 employees from three federal universities using a descriptive survey approach. It concluded that there is a positive outlook on the potential of AI to enhance library efficiency, support users, and analyze data. However, it also identified a set of core challenges, including financial constraints, limited technical infrastructure, concerns about data privacy, and gaps in staff skills. The study emphasized the need for capacity-building initiatives and collaborative partnerships to achieve a responsible integration of AI in these environments.

In a different context that combines artificial intelligence with blockchain technology, the study by Mhsnhasan *et al*. (2025) explored the potential of integrating these two technologies to strengthen the integrity, accountability, and effectiveness of digital rights management systems in modern libraries. The study adopted a hybrid methodology based on a comparative evaluation of existing frameworks, with a focus on their scalability and their security weaknesses. It concluded by proposing a new framework aimed at improving digital rights management through the integration of these two technologies. This framework leaves room for future research addressing compliance with the General Data Protection Regulation (GDPR) and incorporating biometric verification.

Mishra's (2023) study focused on the main ethical frameworks and principles relevant to the use of artificial intelligence and machine learning in libraries and information centers, by

analyzing how these frameworks can be applied in this specific context. The study discussed the benefits and potential risks of these technologies and proposed best practices and strategies to mitigate ethical risks. It emphasized the need for a proactive approach to ensure that the use of these technologies aligns with the library's mission, values, and the interests of its users.

In the same context, a study by Mohamed *et al*., (2024) sought to evaluate the impact of artificial intelligence on the efficiency of libraries, the user experience, and data-driven decision-making in Indian libraries, using structured surveys that included 300 participants from library staff and users. The results showed that 70% of the libraries adopted AI, and 80% of them indicated that it enhanced efficiency, while 75% reported improvements in user experiences. However, 60% of participants expressed concerns about data quality, 55% about privacy, and 50% about ethical considerations, which underscores that the benefits of AI cannot be fully realized without serious attention to these issues.

At the level of Arabic literature, a study by Ali (2024) aimed to survey the scholarly output published in both Arabic and English regarding the ethics of applying artificial intelligence in libraries during the period from 2018 to 2023, using bibliographic and bibliometric methods. The study identified 70 sources and found the importance of unifying international, regional, and national efforts in designing an ethical policy for AI applications in libraries. It also observed a growing increase in the publication rates of foreign scholarly output compared to Arabic output in this field.

Nematillaev *et al*. (2025) examined the operational efficiency, accuracy, and ease of use of AI-supported legal information services, using a comprehensive research methodology that combines quantitative and qualitative approaches through case studies, surveys, and interviews with legal experts and specialists in artificial intelligence. The study concluded that adopting AI-supported information services in legal systems can fundamentally change how procedures are carried out. However, this transformation faces significant challenges, including data security, algorithm transparency, ethical accountability, and potential biases.

In the Arab context as well, a study by Abdelhamid (2025) focused on the use of Chatbots as a marketing tool for the services of the Central Library of Princess Nourah bint Abdulrahman University, adopting an experimental methodology with a single group. The findings revealed that the library does not use any form of AI applications to market its services. The only system known to the staff is the ASRS book storage system. The study also indicated that the library plans, as part of its strategic plan, to introduce AI services in the future.

The study by Al-Jabri and Al-Hanaia (2023) concluded this research line by examining the extent to which academic libraries benefit from AI applications. It targeted libraries of Sultan Qaboos University in the Sultanate of Oman, the University of Leeds in the United Kingdom, and the University of Kuala Lumpur in Malaysia, using an analytical descriptive approach. The study found that all three libraries use AI applications in a range of programs and services, including acquisition, cataloging, circulation, reference services, and other services, reflecting a growing trend toward digital transformation in academic library environments.

In the Arab regional context specifically, Elsayed and Abusharhah (2025) surveyed academic librarians across several Arab countries regarding AI adoption, perceptions, and ethical literacy. Their findings revealed uneven awareness of AI ethics principles among library staff and called for structured, region-specific training programs to close this gap.

On a cross-regional scale, Khan *et al*., (2026) conducted a quantitative study of librarians' ethical risk perceptions, trust, and governance practices regarding generative AI, reporting high ethical risk perception (mean=3.41–3.77) alongside only moderate AI ethics competence (mean=3.47–3.77). This gap between risk awareness and practical competence closely parallels the pattern of moderate ethical commitment identified in the present study.

In South Asia, Jabeen (2025) examined the readiness of academic libraries in Pakistan for adopting AI and related technologies, finding that institutional readiness remained limited by infrastructure gaps and the absence of clear governance policies-challenges that closely mirror those identified in the Jordanian context.

Subaveerapandiyan and Gozali (2024) surveyed library professionals in India regarding their prospects and perceptions of AI, finding generally positive attitudes toward AI's potential alongside persistent concerns regarding staff training and the ethical implications of automated decision-making.

From reviewing the previous studies, it is evident that most of them addressed the topic of artificial intelligence in libraries from multiple perspectives. However, they either focused on the practical side without a deep engagement with ethical dimensions, or they were limited to geographical contexts different from the Jordanian context. Taken together, this body of work reveals a clear research gap: despite growing regional attention to AI ethics in neighboring Arab countries (Elsayed and Abusharhah, 2025), empirical survey-based evidence on the intersection of AI adoption and information ethics remains scarce specifically within the Jordanian academic-library context. What distinguishes the present study is that it brings together, within a single framework, the measurement of the level of using artificial intelligence to improve library services, and the level of commitment to information and privacy ethics, as well as the identification of institutional and technical challenges. This is done in the environment of Jordanian government academic

Table 1: Reliability Coefficients of the Instrument.

Dimension	Number of Items	Cronbach's Alpha Coefficient
The Role of Artificial Intelligence in Improving Services	16	0.87
Information Ethics and Privacy	5	0.81
Challenges	11	0.89
The Instrument as a Whole	32	0.92

libraries, which have not received sufficient research attention in this regard.

METHODOLOGY

This study adopted the analytical descriptive approach, as it is the most suitable methodology for the nature of the study, which seeks to describe the phenomenon as it exists in reality and to analyze its dimensions quantitatively by collecting data from the study sample, analyzing it statistically to answer its questions and achieve its objectives.

Study population and sample

The study population consisted of all employees in Jordanian government academic libraries, totaling (258) employees, according to statistics from the Ministry of Higher Education and Scientific Research for the 2024–2025 academic year. A simple random sample was selected, comprising (137) employees, representing (53.1%) of the study population. This percentage is statistically acceptable for the purposes of generalization. The questionnaire link was sent directly and individually to each of the (137) sampled employees via their official institutional email addresses and closed internal staff groups, rather than being posted openly. All (137) sampled employees completed and returned the questionnaire, yielding a response rate of 100% for the sampled group.

Study tool

To achieve the objectives of the study and answer its questions, the researcher developed a questionnaire based on the theoretical literature and relevant previous studies, particularly (Joel, 2025; Mohamed *et al*., 2024; Ali, 2024). In its final form, the questionnaire consisted of two main sections:

Section One: Personal and job-related data of the study participants (gender, age group, educational level, and years of experience).

Section Two: Questionnaire items distributed across three dimensions:

Dimension One: The role of artificial intelligence in improving the services of academic libraries (16 items).

Dimension Two: Information ethics and privacy (5 items).

Dimension Three: Challenges facing the use of artificial intelligence (11 items).

A five-point Likert scale was used to respond to the items, with responses ranging from (5) for "strongly agree" to (1) for "strongly disagree." To interpret the results, the following criterion was adopted for classifying the arithmetic means:

From 1.00 to less than 2.33: low degree,

From 2.33 to less than 3.67: moderate degree,

From 3.67 to 5.00: large degree.

Validity of the tool

To verify the validity of the instrument, it was presented to a panel of specialized referees in library and information science, curricula, and measurement and evaluation, totaling (7) experts, in order to obtain their opinions regarding the clarity of the items and their relevance and appropriateness to the dimension in which they were placed. In light of their observations, some items were revised and others were rephrased. The questionnaire was considered valid after at least (80%) of the experts approved its items.

Tool stability

To verify the reliability of the instrument, it was administered to a pilot sample consisting of (30) employees who were outside the study sample. The reliability coefficient was then calculated using Cronbach's Alpha. The following Table 1 shows the values of the reliability coefficients:

These values are statistically acceptable for the purposes of scientific research, as Cronbach's alpha coefficients exceeding (0.70) indicate that the study instrument has a good level of reliability and internal consistency. This suggests that the instrument is suitable for field application and for achieving the objectives of the study.

Analysis of the Results of the Field Study and Their Interpretation

This section presents a detailed overview of the field study results and discusses them in light of the study questions, the theoretical literature, and previous studies, as follows:

Results Related to the First Question: What is the level of the role of artificial intelligence in improving the services of Jordanian government academic libraries?

To answer this question, arithmetic means and standard deviations were calculated for the responses of the study sample members to the items in the first axis, as shown in Table 2.

It is evident from Table 2 that the overall arithmetic mean for the level of the role of artificial intelligence in improving the services of Jordanian government academic libraries reached (3.154), with

Table 2: Arithmetic Means and Standard Deviations for the Level of the Role of Artificial Intelligence in Improving Academic Library Services, Arranged in Descending Order.

Rank	The paragraph	Arithmetic mean	Standard deviation	Grade
1	AI makes it easier to provide digital content and facilitate searching within it, which enhances the use of the library.	3.788	1.280	Large
2	It encourages self-learning by providing resources and information that match users' interests.	3.745	1.414	Large
3	It can help compile data from academic texts, providing useful summaries and focused information for users.	3.489	1.340	Moderate
4	AI can analyze historical data to predict users' future needs.	3.299	1.251	Moderate
5	AI helps facilitate access to academic content by translating texts.	3.299	1.233	Moderate
6	Using image-recognition technologies or barcode symbols facilitates the borrowing and returning process.	3.241	1.205	Moderate
7	AI contributes to improving access to information by providing multilingual services, which helps students who are not native speakers of the original language.	3.190	1.198	Moderate
8	AI helps facilitate access to information by providing real-time translation services for the content.	3.124	1.251	Moderate
9	AI can be used to provide customized educational workshops on how to use the library and available resources.	3.124	1.401	Moderate
10	AI helps improve the library's search engine efficiency by understanding users' queries.	3.117	0.883	Moderate
11	AI can predict users' future needs and help guide investments in new resources.	3.037	1.067	Moderate
12	AI –based virtual assistants (chatbots) help provide immediate academic support to students and answer their research inquiries around the clock.	3.007	1.088	Moderate
13	AI provides personalized recommendations for books and articles to users based on their previous interests.	2.861	0.964	Moderate
14	Automating routine processes (such as inventory checks and borrowing) using AI reduces human error.	2.825	1.021	Moderate
15	Coordinating data from multiple sources can be complex, which affects the effectiveness of AI systems.	2.679	0.813	Moderate
16	Customized training workshops can be provided on how to use libraries and available resources using AI	2.635	0.898	Moderate
	The axis as a whole.	3.154	0.388	Moderate

a standard deviation of (0.388). This falls within the moderate range according to the criterion adopted in this study. This result indicates that Jordanian government academic libraries are still at relatively early stages in adopting artificial intelligence technologies in their services, and that this adoption has not yet reached the level needed to achieve the maximum benefit from the capabilities of this technology.

At the level of individual items, the statement "Artificial intelligence facilitates the provision of digital content and makes searching within it easier, thereby enhancing the use of the library" ranked first, with an arithmetic mean of (3.788) and a high degree. This reflects the staff members' awareness of the importance of artificial intelligence in improving access to digital content-an assessment consistent with what Manjunatha (2023) indicated, namely that artificial intelligence is considered an essential enabler for improving information retrieval, organizing it, and making it easily available to users.

The statement "It encourages self-learning by providing resources and information that match users' interests" ranked second, with an arithmetic mean of (3.745) and a high degree. This is consistent with the findings of Mohamed *et al.* (2024), which showed that 75% of beneficiaries noticed an improvement in their experience through personalized AI-supported services. This result can be explained by the fact that academic libraries

have begun to recognize the importance of personalization in delivering information services that meet the specific needs of each user individually.

Conversely, the statement "Customized educational workshops can be provided on how to use libraries and the available resources using artificial intelligence" came in last place, with an arithmetic mean of (2.635) and a moderate degree. This may be attributed to the limited level of cognitive awareness among some staff members regarding how to employ artificial intelligence in training and information literacy, or to a lack of qualified personnel to deliver such workshops-consistent with what Joel (2025) reported regarding skill gaps among library staff in the field of artificial intelligence.

"Coordinating data from multiple sources can be complex, which affects the effectiveness of AI systems" ranked relatively low, with an arithmetic mean of (2.679) and a moderate level. This indicates that staff are aware of the technical challenges related to data integration and data quality, and it aligns with what Mohamed *et al*. (2024) found: that 60% of participants expressed concerns about data quality in AI systems.

Overall, this result is consistent with what the study by Al-Jabri and Al-Hanaia (2023) concluded, namely that academic libraries employ AI applications in a variety of services; however, the degree of adoption varies depending on the available resources and the level of institutional readiness. It also overlaps with the findings of Abdelhamid (2025), which revealed an almost complete absence of AI applications in the Central Library at Princess Nourah University, despite their inclusion in the future strategic plan.

Results Related to the Second Question

What is the level of information ethics and privacy associated with the use of artificial intelligence in Jordanian government academic libraries?

To answer this question, the arithmetic means and standard deviations of the responses of the study sample individuals to the items of the second axis were calculated, as shown in Table 3.

It is evident from Table 3 that the overall arithmetic mean for the level of information ethics and privacy was (3.318), with a standard deviation of (0.524), which falls within the moderate level. This result indicates that Jordanian government academic libraries recognize the importance of the ethical considerations associated with the use of artificial intelligence; however, the actual implementation of these principles is still below the expected level. This may reflect the absence of clear institutional policies governing the ethical use of AI in these libraries.

At the item level, the statement "There is a clear definition of legal responsibility in the event of errors resulting from AI automated recommendations" ranked first with an arithmetic mean of (3.526) and a moderate level. This reflects a relative awareness of the need to define legal responsibility when using intelligent systems. This finding agrees with what Narendra *et al*. (2025) emphasized regarding the importance of establishing clear mechanisms for accountability in cases of error or adverse impact resulting from AI systems. It also aligns with what Nematillaev *et al*. (2025) indicated about the necessity of addressing ethical responsibility issues as one of the significant challenges facing AI applications.

The statement "The library sets specific policies that regulate intellectual property rights for content generated by AI tools" ranked second with an arithmetic mean of (3.358) and a moderate level, indicating that libraries recognize the importance of protecting intellectual property in the age of AI. This result is consistent with what Ali (2024) pointed out about the need to examine authorship, publishing, and ownership rights laws, as well as information ethics in relation to artificial intelligence. It also supports the findings of Mhsnhasan *et al*. (2025), which stressed the importance of developing secure and transparent systems to manage digital rights in libraries.

In contrast, the statement "The library is committed to explaining how AI systems work to users to ensure transparency in service delivery" ranked last with an arithmetic mean of (3.102) and a moderate level. This reflects a clear shortfall in libraries' commitment to the principle of transparency, which is a fundamental pillar of AI ethics. This result may be explained by the fact that many AI systems operate using complex algorithms that are difficult to explain to ordinary users, or because libraries may not have qualified staff capable of clarifying these mechanisms in simple terms. This finding aligns with what Mishra (2023) observed about the difficulty in understanding how some AI systems work, and with what SAP (2024) stated that transparency is one of the most prominent ethical challenges in employing this technology.

The statement "There are clear mechanisms to ensure that the search results proposed through AI are neutral and not biased toward a particular party or ideology" also came with a moderate level, with an arithmetic mean of (3.292). This indicates that there are concerns about algorithmic bias in AI systems used in libraries. This result is consistent with what Sahnoun and Balash (2024) emphasized-that bias in algorithms makes outcomes questionable, unreliable, and potentially discriminatory. It also aligns with Mohamed *et al*. (2024), who stressed the need to address issues of data quality and bias to ensure fairness in the services provided.

Overall, this finding agrees with what Mishra (2023) concluded about the importance of following a proactive and ethical approach to using AI in libraries, ensuring that such use is consistent with their mission and values. It also intersects with what UNESCO (2019) emphasized regarding the necessity of

handling users' data in accordance with international law and with full respect for their privacy and dignity.

Results Related to the Third Question

What is the level of challenges faced by Jordanian government academic libraries in implementing artificial intelligence technologies?

To answer this question, the arithmetic means and standard deviations of the responses of the study sample members to the items of the third axis were calculated, as shown in Table 4.

It is evident from Table 4 that the overall arithmetic mean for the level of challenges facing the use of artificial intelligence in Jordanian government academic libraries reached (3.638), with a standard deviation of (0.606). This falls within the "moderate" degree. This result indicates that the implementation of artificial intelligence in Jordanian academic libraries faces a set of fundamental challenges that hinder achieving the maximum benefit from this technology. Addressing these challenges requires a comprehensive institutional intervention at the levels of policies, resources, and human capabilities.

At the level of individual items, the statement "Employees and beneficiaries resist adopting artificial intelligence technologies due to their habituation to traditional systems and practices" ranked first, with an arithmetic mean of (4.591) and a high degree. This reflects the presence of clear cultural resistance to adopting modern technologies in the environment of Jordanian academic libraries. This result can be interpreted as the fact that technological change often raises concerns among staff regarding the continuity of their jobs or their ability to adapt to new systems. This finding is consistent with what was observed in Joel's study (2025) regarding skill gaps among library employees, and with what Abdelhamid's study (2025) indicated about the Central Library at Princess Nourah University not using any form of artificial intelligence applications despite their inclusion in the strategic plan.

The statement "The decline of the human role and ethical values in the decision-making process as a result of excessive reliance on automated outputs" ranked second, with an arithmetic mean of (4.080) and a high degree. This reflects deep ethical concern about the impact of artificial intelligence on the human element in the library. This result is consistent with what Mishra (2023) emphasized regarding the necessity of adopting a proactive and ethical approach that ensures the human remains at the center of the decision-making process, and with what UNESCO (2019) pointed out about the importance of preserving human dignity when using artificial intelligence technologies.

The statement "The weakness of cognitive awareness among some employees and beneficiaries regarding the mechanisms for ethical and effective handling of artificial intelligence applications" ranked third, with an arithmetic mean of (3.803) and a high degree. This confirms the urgent need for training and awareness programs targeted at both employees and beneficiaries. This result is consistent with what Joel's study (2025) concluded regarding the necessity of capacity-building initiatives to facilitate the responsible integration of artificial intelligence in academic libraries, and with what Ali's study (2024) emphasized about the importance of enhancing digital culture by educating users about artificial intelligence and data ethics.

The statement "Coordinating data from multiple sources can be complex, which affects the effectiveness of artificial intelligence systems" ranked fourth, with an arithmetic mean of (3.672) and a high degree. This indicates the presence of essential technical

Table 3: Arithmetic Means and Standard Deviations for the Level of Information Ethics and Privacy, Ranked in Descending Order.

Rank	The paragraph	Arithmetic mean	Standard deviation	Grade
1	There is a clear definition of legal liability in the event of errors resulting from automated AI recommendations	3.526	1.085	Moderate
2	The library establishes specific policies governing intellectual property rights for content created using artificial intelligence tools.	3.358	0.945	Moderate
3	The use of artificial intelligence technologies in the library ensures the protection of patron data and guarantees that it is not shared with third parties without permission.	3.314	0.881	Moderate
4	There are clear mechanisms to ensure that search results suggested via artificial intelligence are neutral and unbiased toward any specific party or ideology.	3.292	0.925	Moderate
5	The library is committed to explaining how artificial intelligence systems operate to users, ensuring transparency in service delivery.	3.102	1.139	Moderate
	The axis as a whole	3.318	0.524	Moderate

Table 4: Arithmetic Means and Standard Deviations for the Level of Challenges Facing the Use of Artificial Intelligence in Libraries, Ranked in Descending Order.

Rank	The paragraph	Arithmetic mean	Standard deviation	Grade
1	Employees and beneficiaries resist the adoption of AI technologies due to their familiarity with traditional systems and practices.	4.591	1.415	Large
2	The decline of the human role and ethical values in the decision-making process as a result of excessive reliance on automated outputs.	4.080	1.112	Large
3	Low level of awareness among some employees and beneficiaries regarding the mechanisms for ethical and effective interaction with AI applications.	3.803	1.097	Large
4	Coordinating data from multiple sources can be complex, affecting the effectiveness of AI systems.	3.672	1.307	Large
5	Limited budgets allocated for supporting the sustainability and future modernization of AI technologies.	3.496	1.461	Moderate
6	The potential for algorithmic biases in AI systems leading to unfair or inaccurate outcomes for beneficiaries.	3.467	1.414	Moderate
7	Ambiguity of laws and regulations regarding the protection of intellectual property rights for AI-generated outputs in the university environment.	3.460	1.260	Moderate
8	The time gap between the rapid evolution of AI technologies and the ability of library legislation and internal regulations to keep pace with them.	3.445	1.388	Moderate
9	The difficulty of technical integration between modern AI systems and the library's existing infrastructure and traditional systems.	3.358	1.349	Moderate
10	A shortage of qualified personnel and specialized technical expertise in the management and maintenance of AI systems.	3.336	1.457	Moderate
11	The process of collecting user data in AI systems raises serious concerns regarding privacy and cybersecurity.	3.314	0.945	Moderate
12.	The axis as a whole.	3.638	0.606	Moderate

challenges related to data quality and interoperability. This finding aligns with Mohamed *et al.*'s study (2024), which indicated that 60% of participants expressed concerns about data quality in artificial intelligence systems.

In contrast, the statement "The process of collecting users' data in artificial intelligence systems raises serious concerns about privacy and cybersecurity" ranked last, with an arithmetic mean of (3.314) and a moderate degree. This result may appear contradictory to the theoretical argument that emphasizes the centrality of privacy in ethical considerations. This outcome can be explained by the fact that Jordanian libraries are still in the early stages of adopting artificial intelligence; therefore, the issue of data collection and analysis has not yet reached the level that would cause significant concerns among staff. However, this does not lessen the importance of addressing this issue proactively before expanding the use of artificial intelligence, as Nematillaev *et al.*'s study (2025) stressed the need to address data security issues from the beginning.

The statement "The limitation of budgets allocated to support the sustainability of artificial intelligence technologies and their future updates" ranked fifth, with an arithmetic mean of (3.496) and a moderate degree. This finding is consistent with what Joel's study (2025) observed, namely that financial constraints hinder the adoption of artificial intelligence in academic libraries in the northeastern region of Nigeria-a context that closely resembles the Jordanian context in terms of limited resources.

Overall, this result is consistent with what Manjunatha's study (2023) concluded, namely that integrating artificial intelligence into libraries faces obstacles that include ethical considerations, technical barriers, and concerns related to job displacement. Addressing these challenges requires effective strategies at the institutional and national levels.

Table 5: Results of the Multivariate Analysis of Variance (MANOVA) for differences in the study dimensions according to personal variables.

Variable	Dependent variable	Sum of squares	Degree of freedom	Mean of squares	F-value	Level of significance
Gender	Improving library services	0.011	1	0.011	0.090	0.766
	Information Ethics	0.866	1	0.866	3.697	0.059
	Challenges	0.053	1	0.053	0.110	0.741
Age group	Improving library services	0.177	2	0.089	0.693	0.504
	Information Ethics	0.069	2	0.034	0.147	0.864
	Challenges	0.121	2	0.061	0.127	0.881
Educational Level	Improving library services	0.925	3	0.308	2.414	0.075
	Information Ethics	0.831	3	0.277	1.183	0.324
	Challenges	1.079	3	0.360	0.754	0.524
Years of experience	Improving library services	0.113	3	0.038	0.295	0.829
	Information Ethics	0.746	3	0.249	1.061	0.372
	Challenges	0.570	3	0.190	0.399	0.754

Results Related to Question Four

Are there statistically significant differences at a significance level $\alpha \leq 0.05$ in the level of artificial intelligence, information ethics, and challenges according to personal variables?

To answer this question, a Multivariate Analysis of Variance (MANOVA) was used to identify differences in the responses of the study sample members on the three study dimensions according to personal variables (gender, age group, educational level, and years of experience), as shown in Table 5.

It is clear from Table 5 that there are no statistically significant differences at the significance level ($\alpha \leq 0.05$) in the level of the role of artificial intelligence in improving library services, the level of information ethics and privacy, and the level of the challenges facing the use of artificial intelligence, according to all personal variables (gender, age group, educational level, and years of experience).

Regarding the gender variable, the value of F for the three axes in succession was (0.090,3.697,0.110) with significance levels (0.766,0.059,0.741). All of these are not statistically significant. This result indicates that the perceptions of library staff regarding the role of artificial intelligence, the ethical considerations, and the challenges associated with it do not differ according to their gender. This can be interpreted as artificial intelligence issues and information ethics being general professional concerns that matter to all staff regardless of gender.

Regarding the age-group variable, the value of F for the three axes in succession was (0.693,0.147,0.127) with significance levels (0.504,0.864,0.881). All of these are not statistically significant. This result suggests that different age groups have relatively similar perceptions of artificial intelligence in libraries, which may reflect a homogeneity in the level of awareness of these issues across different generations of staff.

Regarding the educational level variable, the value of F for the three axes in succession was (2.414,1.183,0.754), with significance levels (0.075,0.324,0.524). All of these are not statistically significant. Although the value of F for the "service improvement" axis was (2.414) at a significance level (0.075)- which is close to the threshold of statistical significance-it still remains higher than the significance level adopted in this study (0.05), meaning that there are no statistically significant differences. This may indicate that academic qualification alone is not sufficient to form substantially different perceptions of artificial intelligence, and that the decisive factor may be specialized training and actual exposure to these technologies.

Regarding the years of experience variable, the value of F for the three axes in succession was (0.295,1.061,0.399), with significance levels (0.829,0.372,0.754). All of these are not statistically significant. This result suggests that traditional library experience is not necessarily reflected in different perceptions of artificial intelligence. This can be explained by the fact that artificial intelligence is a relatively new field for all staff, regardless of their years of experience in traditional library work.

Overall, this result indicates a clear homogeneity in the perceptions of staff in Jordanian government academic libraries regarding artificial intelligence, information ethics, and the related challenges, regardless of their personal and job-related characteristics. This homogeneity may reflect the early stage these

libraries are going through in adopting artificial intelligence, where clear differences have not yet emerged among staff groups in terms of levels of awareness or practice. It may also reflect the absence of specialized training programs targeting specific categories of staff, which led to similar awareness levels among all.

This result partly agrees with what Joel (2025) indicated regarding the existence of shared challenges facing all library staff regardless of their characteristics. It also overlaps with what Mohamed *et al.* (2024) observed, namely that the ethical and technical challenges associated with artificial intelligence represent general issues of concern to all categories working in libraries.

CONCLUSION

In light of the findings reached by this study, the following conclusions can be drawn:

First: Regarding the Role of Artificial Intelligence in Improving Library Services

The study concluded that the level of adopting artificial intelligence to improve services in Jordanian government academic libraries was moderate (arithmetic mean=3.154). This indicates that these libraries are still in the early stages of benefiting from the capabilities of this technology. The most evident role of artificial intelligence lies in facilitating access to digital content and enhancing independent learning through personalized recommendations. In contrast, its role remains limited in areas such as training, information literacy, and data coordination from multiple sources. This reflects the existence of a gap between the theoretical potential of artificial intelligence and its actual application in the Jordanian library environment.

Second: Regarding Information Ethics and Privacy

The study showed that the level of commitment to information ethics and privacy when using artificial intelligence in Jordanian government academic libraries was moderate (arithmetic mean=3.318). This suggests there is a relative awareness of ethical considerations, yet this awareness has not been fully translated into clear policies and actual practices. Legal responsibility and the protection of intellectual property rights emerged as two areas that received relatively greater attention. Meanwhile, transparency in explaining how intelligent systems work and their neutrality regarding algorithmic bias remains a challenge that requires serious attention. This reveals an urgent need to develop clear ethical frameworks governing the use of artificial intelligence in Jordanian libraries.

Third: Regarding Challenges

The study revealed that the level of challenges facing the adoption of artificial intelligence in Jordanian government academic libraries was moderate, though approaching the high range (arithmetic mean=3.638). This confirms the presence of fundamental obstacles that hinder maximizing the benefit of this technology. These challenges are led by cultural resistance to adopting new technologies, concerns about a decline in the human role in decision-making, weak awareness of the mechanisms for dealing ethically with artificial intelligence, and the complexity of coordinating data from multiple sources. Taken together, these challenges indicate that the success of adopting artificial intelligence in Jordanian libraries does not depend solely on the availability of the technology; rather, it requires comprehensive cultural change, the development of specialized human capacities, and the establishment of clear institutional policies.

Fourth: Regarding Personal Variables

The study found no statistically significant differences in the perceptions of employees regarding artificial intelligence, its ethics, and the challenges associated with it, according to personal variables (gender, age group, educational level, and years of experience). This suggests a clear consistency in the level of awareness and understanding of these issues across different employee groups. This uniformity may be due to the fact that artificial intelligence is a relatively new field for everyone, along with the lack of specialized training programs targeting specific groups, which led to convergence in the level of knowledge and practice among all employees.

Fifth: General Conclusion

The study concludes that Jordanian government academic libraries are currently at a crossroads: they recognize the importance of artificial intelligence and its potential to develop their services, and they understand the ethical challenges associated with it. However, they still do not have the tools, policies, and necessary capacities to translate this awareness into real, sustainable practice. Therefore, maximizing the benefit of artificial intelligence in these libraries requires a comprehensive strategic intervention at the level of policies, resources, training, and infrastructure, ensuring a balance between technical efficiency and ethical responsibility.

RECOMMENDATIONS

Based on the results and conclusions reached by this study, the researcher recommends the following:

First: Recommendations for the Administrations of Government Academic Libraries

1- Develop a clear strategic plan to adopt artificial intelligence in library services, including specific goals, a realistic timeline, and clear performance measurement indicators, ensuring a gradual transition from theoretical awareness to actual implementation.

2- Establish an institutional code of ethics governing the use of artificial intelligence in the library, including

clear policies to protect users' privacy, ensure algorithm transparency, define legal responsibility, and address algorithmic bias, in line with international standards for AI ethics.

3- Design specialized training programs for library staff that cover the technical and ethical aspects of using artificial intelligence, including training on specific tools, understanding the principles of machine learning, and addressing privacy and bias issues, with the aim of building qualified personnel capable of using this technology responsibly.

4- Launch awareness campaigns for users explaining how the AI systems used in the library work, their rights to protect their data, and the procedures for filing complaints if bias or errors occur in the provided services, thereby strengthening trust between users and the library.

5- Start with limited-scope pilot projects to apply artificial intelligence in selected services (e.g., chatbots or smart recommendation systems) and evaluate their outcomes periodically before scaling up, in order to reduce risks and allow learning from the experience.

6- Allocate sustainable budgets to support and update AI technologies, and invest in the necessary technical infrastructure, including servers, databases, and cybersecurity systems.

Second: Recommendations for Policy Makers at the Ministry of Higher Education

1- Issue a national guide on the ethics of using artificial intelligence in higher education institutions in general and academic libraries in particular, to serve as a mandatory reference for all government libraries and ensure the unification of ethical standards and practices.

2- Establish a specialized unit within the Ministry of Higher Education or within universities responsible for supporting the digital transformation of academic libraries. This unit should provide technical and ethical consultations, organize national training programs, and monitor the implementation of policies and standards.

3- Encourage partnerships between Jordanian academic libraries and leading regional and international libraries in the field of artificial intelligence, enabling the exchange of expertise and best practices and benefiting from successful experiences.

4- Allocate grants and research projects to study the applications of artificial intelligence in Jordanian libraries, evaluate their effectiveness, and monitor their challenges, thereby enriching the local knowledge base and guiding future policies.

5- Develop clear national legislation regulating the protection of personal data and intellectual property rights in the context of using artificial intelligence, in line with international standards such as the General Data Protection Regulation (GDPR).

Third: Recommendations for Researchers and Future Studies

1- Conduct experimental studies measuring the impact of specific AI applications (such as chatbots or smart recommendation systems) on users' satisfaction and the efficiency of library services in the Jordanian context, providing empirical evidence to support decision-making.

2- Study the relationship between the adoption of artificial intelligence and the quality of library services from the perspective of users (students and faculty members), to complement the picture this study drew from the viewpoint of library staff.

3- Conduct comparative studies between public and private academic libraries in Jordan regarding the level of AI adoption and ethical practices, to reveal the effect of ownership patterns on the level of adoption and ethical commitment.

4- Develop theoretical models and frameworks specifically tailored to the Arab environment for governing the use of artificial intelligence in libraries, taking into account the cultural, legal, and institutional specificities of the region.

5- Conduct in-depth studies on technical challenges, such as coordinating data from multiple sources, integrating intelligent systems with traditional infrastructure, and securing data, to provide technical solutions applicable to the local environment.

6- Conduct longitudinal studies that track the evolution of artificial intelligence adoption in Jordanian academic libraries over multiple years, monitoring emerging changes, developments, and challenges.

ABBREVIATIONS

AI: Artificial Intelligence; **MANOVA:** Multivariate Analysis of Variance; **GDPR:** General Data Protection Regulation; **ASRS:** Automated Storage and Retrieval System; **UNESCO:** United Nations Educational, Scientific and Cultural Organization.

CONFLICT OF INTEREST

The author declares that there is no conflict of interest.

REFERENCES

Abdelhamid, L. M (2025). Using Artificial Intelligence Methods in Marketing University Library Services: An Empirical Study. Scientific Journal of Libraries, Documentation, and Information, 7(21). https://search.emarefa.net/ar/detail/BIM-1629496

Ali, A. H (2024). Ethics and Applications of Artificial Intelligence in Libraries. Journal of the Faculty of Arts – Beni-Suef University, Issue 71 DOI:10.21608/jfabsu.2024.273231.1317

Joel, A. P (2025). Prospects and Challenges of Artificial Intelligence Technologies in Academic Libraries in Northeastern Nigeria.Global scientific research journals,12(1) DOI:10.15651/2449-0628.25.12.071

Das, A. K. (2021). Digital Transformation and Ethics in the Context of Responsible Artificial Intelligence. Journal of Scientometric Research, 10(2), 286–287. https://doi.org/10.5530/jscires.10.2.44

Resnik, D. B., & Mohammad Hosseini (2025). The ethics of using Artificial Intelligence in scientific research: new guidance needed for a new tool.AI and Ethics (2025) 5:1499–1521. https://link.springer.com/article/10.1007/s43681-024-00493-8

Elsayed, A. M., & Abusharhah, M. M. (2025). Artificial Intelligence adoption, perceptions, and ethical literacy among Arab academic librarians: A survey. Journal of Academic Librarianship, 51(5), 103083. https://doi.org/10.1016/j.acalib.2025.103083

Jabeen, M. (2025). Assessing the readiness for the adoption of artificial intelligence and related technologies in academic libraries of Pakistan. Journal of Academic Librarianship, 51(6), 103161. https://doi.org/10.1016/j.acalib.2025.103161

Jabri, S & Hanaia, A (2023). Applications of Artificial Intelligence Technologies in Information Services at Libraries and Information Centers: Academic Libraries as a Case Study. *Arab International Journal of Information and Data Technology*, 3(3). https://search.mandumah.com/Record/1431828/Details

Khan, Z. I., Oladokun, B. D., Upadhyay, A. K., & Kalbande, D. (2026). Ethical concerns of generative AI in academic libraries: A cross-regional quantitative study of librarians' risk perceptions, trust, and governance practices. Journal of Librarianship and Information Science. https://doi.org/10.1177/09610006261461309

Madegowda, J. (2025). High Costs, Long Waits, and Ethical Dilemmas: A Review of Challenges in Academic Publishing. Journal of Scientometric Research, 14(2), 413–423. DOI:10.5530/jscires.20250015

Makhashen, G. M. B., & Al-Jamimi, H. A. (2023). An intelligent prediction of the next highly cited paper using machine learning. *Journal of Scientometric Research*, *12*(1), 44-53.

Manjunatha, K. (2023). A study on the impact of Artificial Intelligence (AI) on library services. International Journal of Research in Library Science (IJRLS),9(4) DOI:10.26761/ijrls.9.4.2023.1696

Mhsnhasan, M., Selvaraj, V., Victor, M., Vijayakumar, M., Kannan, A., & Anand, U. (2025). Leveraging AI And Blockchain for Secure Digital Right Management in Libraries. Indian Journal of Information Sources and Services, 15(3), 257-265. DOI: https://doi.org/10.51983/ijiss-2025.IJISS.15.3.29

Mishra, Sudhakar. (2023) "Ethical Implications of Artificial Intelligence and Machine Learning in Libraries and Information Centers: A Frameworks, Challenges, and Best Practices". Library Philosophy and Practice (e-journal). 7753.https://digitalcommons.unl.edu/libphilprac

Mohamed, N., Ramjani, S & Abul Hussain, A. (2024). Artificial Intelligence in Libraries: Benefits, Challenges, and Ethical Considerations. International Journal of Advance and Applied Research,11(6), 72-76. DOI-10.5281/zenodo.13253588

Mourad, S (2025). Employing Artificial Intelligence Techniques to Improve University Library Performance: A Field Study at the University Libraries of Mohamed Khider University of Biskra. *Journal of Studies and Research*, 17(1). https://asjp.cerist.dz/en/article/262106

Narendra, P., Dewi, C., Gunawan, L., & Ardi, A. (2025). Artificial Intelligence Implementation in Library Information Systems: Current Trends and Future Studies. Vietnam journal of computer science.12(03), 209-233. DOI:10.1142/S2196888824300023

Nematillaev, O., Turdiev, Kh., Kenjayev, T., Kilicheva, K., Sapaev, I., Axmadaliyeva, X., *et al.* (2025) Integrating AI-Based Information Services in Legal Systems: Opportunities and Challenges. *Indian Journal of Information Sources and* Services, 15(2)406-412. DOI: https://doi.org/10.51983/ijiss-2025.IJISS.15.2.49

Pandey, S., Verma, M. K., & Shukla, R. (2021). A scientometric analysis of scientific productivity of artificial intelligence research in India. *Journal of Scientometric Research*, *10*(2), 245-250.

Sahnoun, K & Balash, I (2024). The Issue of Algorithmic Bias in Artificial Intelligence within Financial Services. *Al-Manhal Al-Iqtisadi Journal*, 7(2) https://archives.univ-eloued.dz/handle/123456789/36590

SAP. (2024).AI- ethics. Retrieved from. https://www.sap.com/resources/what-is-ai- ethics

Subaveerapandiyan, A. and Gozali, Alfian Akbar, (2024). "AI in Indian Libraries: Prospects and Perceptions from Library Professionals" *Open Information Science*, 8(1), 20220164. https://doi.org/10.1515/opis-2022-0164

UNESCO. (2019). AI in Education: Ethical Guidelines. Retrieved fromhttps://unesdoc.unesco.org/ark:/48223/pf0000381137

Yaroshenko, T. o & Iaroshenko, O. I.(2023). Artificial Intelligence (AI) for Research Lifecycle: Challenges and opportunities, University Library at a New Stage of Social Communications Development. Conference Proceedings, 2023, No. 8 https://doi.org/10.15802/unilib/2023_294639

Cite this article: Al-Tawalbeh SA. Artificial Intelligence and Information Ethics in Jordanian Government Academic Libraries: Reality and Challenges. J Scientometric Res. 2026;15(3):1049-61.