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Artificial Intelligence in Information Management: Transforming Information Retrieval, Classification, and Management Systems

Azratul Ain Nadiah Ismail[1], Saiful Farik Mat Yatin[2], Nur Imana Mustakin[1], Aina Musfirah Mustafa Kamal[1], Roslaizam Daud[1]

[1]*Faculty of Information Science, Universiti Teknologi MARA Cawangan Selangor, Kampus Puncak Perdana, 40150 Shah Alam, Selangor, Malaysia*
[2]*Institute for Big Data Analytics and Artificial Intelligence (IBDAAI) Universiti Teknologi MARA, Shah Alam, Malaysia*

Corresponding Authors' Email Address: azratulainnadiah@gmail.com

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ABSTRACT

The integration of Artificial Intelligence (AI) into information management improves efficiency, system reliability, and decision-making. This article examines how AI enhances information retrieval accuracy, classification precision, and impacts knowledge accessibility and data management. Using a literature review, the study highlights AI techniques like machine learning and natural language processing, which improve indexing, categorization, and retrieval, boosting performance. Ethical challenges, such as data privacy and algorithmic bias, require attention for responsible deployment. Effective AI integration enhances decision-making, productivity, and customer satisfaction. Future research should focus on aligning AI with ethical considerations and organizational needs.

INTRODUCTION

Information management is often a critical aspect of an organization. For example, regarding the management of physical documents and files. Based on the development of technology, the characteristics of information have also developed. The amount of data has grown rapidly, and information has been digitized. However, this digital shift has led to new challenges. It is related to the retrieval, classification and obtaining advantages from this big data. Due to this, traditional information management systems have difficulty keeping pace. It is not designed to manage large quantities of data. So, this has led to the intervention of Artificial Intelligence (AI) to provide a solution to this problem. In this highly sophisticated age, AI is the first choice for organizations to solve problems. This is because it helps in making more accurate and faster decisions, as well as handling large data sets and maintaining data quality. According

to the International Organization for Standardization [ISO], (2022), AI can be defined as a system created to produce predictions, content, decisions or recommendations through human-defined goals in scientific and technical fields. The use of algorithms and machine learning has been used to identify patterns, analyze data and make better decisions or predictions over time.

AI had a profound impact on the information acquisition system where access methods are formed including vast data sources processed and used. The information retrieval system relies on password-based searches and structured databases. However, the existence of AI such as machine learning, semantic understanding and natural language processing has revolutionized this system where personalization, relevance and better efficiency have been provided (Adelakun, 2024). Other than that, there are many benefits of AI in information management fields. Among the benefits are, AI search engines will provide more comprehensive search results and include various related content including articles, images or videos. Followed using AI can help filter out irrelevant content and be able to deliver more accurate results. Lastly, the use of AI will constantly update the algorithm to keep up with current developments. This is so that users are always presented with the most accurate and up-to-date information (CastorDOC, 2023). In short, this article will focus on discussing how AI is transforming information retrieval, classification and management systems.

LITERATURE REVIEW

This literature review explores into how AI's changing the landscape of information management by focusing on its effects on information retrieval, classification, and management systems. The incorporation of AI in these systems reflects the rising trend of using AI tools to improve efficiency and accuracy, within organizations data processes in today's knowledge-based settings. In the studies examined far reveal that important topics consist of how AI can enhance retrieval accuracy using machine learning and natural language processing techniques; the progress made in AI-driven classification systems; and AIs wider impact on aiding data organization and knowledge management within enterprises.

For instance, (Boughanem et al., 2020) point out that AI powered Information Retrieval Systems (IRSs) use learning driven models to tackle data uncertainties and cater to user preferences effectively, resulting in responses to intricate queries. This enhancement in retrieval is crucial as it does not streamline information access but also boosts user interaction, with datasets. Despite these progressions, in technology and innovation in this field of study challenges still exist in capturing the human language nuances and improving AI models to achieve accuracy, highlighted by the requirement for additional investigation, into comprehending user intentions and the context of queries.

AI also plays a role in enhancing classification systems by automating how data is categorized using algorithms such as Naive Bayes classifiers. According to Tian, (2024) they mention that these systems leverage AI for tasks like tagging to improve data accessibility and consistency. Despite their ability to minimize errors and streamline organization processes swiftly; the AI still need adjustments to handle a range of datasets autonomously which indicates a need for further research on enhancing AI flexibility and decreasing reliance on human input.

Moreover, the involvement of AI, in managing information goes beyond handling tasks to individual tasks to the overall structuring and retrieval of organizational knowledge. According to Jarrahi et al., (2022), AI powered knowledge management systems utilize learning and recommendation algorithms to structure and retrieve knowledge in a manner to reusing and enhancing it within enterprises. Nevertheless, there are issues, like data privacy and algorithmic bias which haven't been thoroughly examined in AI applications thus emphasizing the significance of responsible AI implementation. These void areas underscore the importance of conducting studies that concentrate on the incorporation of AI, into information systems aiming to strike a balance, between leveraging AIs advantages while prioritizing ethical data practices and privacy protections.

Overall, this review illustrates that AI has brought transformative changes to information management by advancing capabilities in retrieval, classification, and organizational knowledge handling. Nonetheless, it identifies key gaps, particularly around ethical AI implementation and the adaptability of AI models, suggesting avenues for further research to fully realize AI's potential in this domain. Addressing these gaps will support the development of more efficient, accurate, and ethically responsible information management systems, making this an essential area of study.

METHODOLOGY

This study method is built upon an in-depth evaluation of various peer-reviewed journal articles that reveal the various applications and outcomes of AI in these fields. The methodologies used in this analysis can be divided into three elements: a literature section, an analytical framework, and data synthesis.

The first component of our methodology consisted of a specific selection of journal articles relevant to the integration of AI and information management. Making use of online academic information sources such as Google Scholar and Science Direct, we (the researcher) specified articles according to keywords, namely "Artificial Intelligence", "Information Management", "Information Retrieval", "Information Classification", and "Information Management System". Our selection parameters are relevance, timeliness, academic papers, and diversity of viewpoints. To ensure the integration of the latest developments and technologies in AI, we selected articles that were published in the last five years, focusing on applications of AI in information retrieval, classification, and management systems.

We then established an analytical structure to evaluate the selected articles. By focusing on which AI techniques were used in the particular research, it gave us ideas on the utmost development technologies of AI. We evaluated articles for integration of AI in information retrieval, classification, and management systems to determine AI utilization, results, and implications in information management. Also included is the observation on the issues and limitations of AI in order to identify the possible challenges for the integration.

We consolidated the findings of the articles to draw general conclusions about the evolution of information management in AI. The process begins with identifying topical similarities from the chosen articles, focusing on aspects that have improved significantly with the introduction of AI into information management activities. This extensive analysis helps identify unexplored aspects that need future research.

The methodologies contribute to the framework of the review, which studies the improvement of information retrieval, classification, and information management systems when AI introduced to operational activities. It was used as a basis to elaborate in more detail and provide input for the upcoming research.

FINDINGS

This article is to explore the ways in which AI enhances the accuracy and efficiency of information retrieval in information management systems. Furthermore, this article aims to examine how AI improves the precision and structure of classification systems. Moreover, the investigation intends to evaluate how AI impacts information management systems by emphasizing knowledge accessibility organization and data management.

The article is focused on these inquiries; How does AI boost the accuracy and efficiency of information retrieval in information management systems? In what ways does AI elevate the accuracy and structure of classification systems? Lastly, what are the notable effects of AI in information management systems concerning knowledge accessibility organization and data management?

AI in Information Retrieval

Observing the enhancement of accuracy in information retrieval and the enhancement of efficiency in this domain demonstrates the impact of AI. The literature review reveals the significant impact of AI on improving information retrieval (IR) accuracy and efficiency. AI methods provide enhanced indexing by providing more correctness to the IRSs, improving the classification of documents, and enhancing knowledge management (Boughanem et al., 2020; Jarrahi et al., 2023). Smart computing assistants simplify the process of content analysis and classification and generate useful summaries, which increase the speed of research and accuracy. This has been a valuable factor when working in an environment involving large amounts of data (Djoumana, 2023).

The subsequent methods improve upon these by enabling the processing of large datasets, enhancing the classification and retrieval processes using a learning model that adapts as the user interacts with the system (Tian, 2024). Classification enriches productivity by specifying the accentuated characteristics as naive Bayes; it improves the odds of accuracy, minimizes the recovery epoch, and increases relevance (Tian, 2024). These methods improve information retrieval systems by meeting user requirements efficiently and accurately.

Intelligent Information Retrieval (IIR) systems also rely on fuzzy logic models to make sense of user queries and determine the relevance of documents more efficiently (Boughanem et al., 2020). This flexibility enables the systems to prioritize documents that match user intentions well and improve retrieval accuracy, in uncertain search situations. In the field of knowledge management AI aids IRS by organizing, categorizing, and storing data for easy retrieval. Through advanced algorithms, AI systems find connections between disparate data sets to deliver more nuanced and contextual information that can facilitate more informed decision making. Future AI innovations such as neural networks and transformer models may significantly advance information retrieval by enabling systems to better comprehend the users' intentions and context (Jarrahi et al, 2023). In knowledge management, real-time updates based on AI will prove to be more beneficial as they are the ones who directly learn from end-users and ensure relevancy in better precisions.

Overall, these findings underscore AI's is an important tool to fulfil the need for timely and accurate information, and with its evolution, it might further change the way we discover our required information by providing even more accuracy, efficacy and personalized.

AI in Classification Systems

The next objective aims to examine AI's role in enhancing precision and organization in classification systems. Classification is a critical process where similar things are grouped together, and different things are separated. Classification systems rely on accurate categorization such as machine learning, computer vision and natural language processing that has been enhanced by AI techniques.

In the expert knowledge base, the expert system in classification mainly investigates classifying the information sources and the challenges related to the representation of the clarification system. It focuses on the need for technology to assist in classification and specific examples of expert classification systems are also presented. AI technology offers enormous potential to improve accuracy, efficiency and decision-making processes in the field of information management. AI is revolutionizing how organizations handle and leverage information which is from data classification and retrieval to knowledge analysis and extraction (Djoumana, 2023).

In addition, AI has broad application prospects and potential in enterprise business information management archive systems. The level of automation and system intelligence can be increased and efficient management and intelligent analysis of large amounts of enterprise information can be achieved (Tian, 2024). He adds that, this machine learning system can automatically classify and annotate enterprise information, achieving automatic data processing and analysis.

Other than that, deep learning AI has a constitutive relationship with big data, these data-driven self-learning algorithms open new possibilities for harvesting, classifying, organizing, storing and retrieving big data generated in organizations including data that is difficult to decipher (Jarrahi et al., 2023). By improving classification accuracy and organization, structured knowledge bases where information is categorized logically will be built with the assistance of AI.

In short, the integration of AI into classification systems represents a transformative shift in information management as well as providing significant advances in efficiency, decision making and accuracy. Not only does it automate and optimize data retrieval and processing, but this technology also enables the intelligent structuring of vast knowledge bases especially in enterprise settings. The growing synergy between classification systems and AI will support better informed decisions and it will lead to the era of smarter and data driven knowledge management.

AI in Information Management Systems

Next objectives are focuses on evaluating the impact of AI on information management systems and accessibility to knowledge and organization as well as the increase in power over data processing within enterprises. This objective echoes Question 3, which explores the impact of AI on information accessibility, organization and effectiveness across levels.

AI has modified the way information is managed, through techniques to organize knowledge and address now complex and time-consuming tasks easier in nature. AI powered information management systems utilize machine learning techniques along with natural language processing and other AI tools to enhance not data retrieval. Also streamline the sorting and arrangement of data. For instance, information systems designed for knowledge management that integrate deep learning algorithms can automatically. Organize data making it convenient for users to promptly access the information they need. By implementing this method, it lessens the need for effort in arranging data which improves the effectiveness of the system overall according to Jarrahi et al. (2022). They add that these systems aid in the recycling of knowledge by structuring data to make it easily accessible across departments or user levels, within a company leading to operational consistency and increased productivity.

However, incorporating AI into managing information also brings about some obstacles regarding data privacy and the transparency of algorithms. Relying on AI for managing data frequently means dealing with quantities of information which gives rise to concerns over privacy. Moreover, the intricacy of AI algorithms involved in learning can result in a lack of clarity making it tough for companies to completely grasp and regulate how their data is handled. These issues point out a gap in existing studies since there is a growing demand to investigate structures and principles that guarantee clear AI implementation, in information handling.

In addition, to that point of view people have surrounded AI powered administration systems which do a job at automating tasks but still need fine tuning to better adjust to situations and types of data available for use in the system operation smoothly. For example, when there is a range of data being processed by these AI systems, they should be able to adapt and organize the information with accuracy without having humans constantly supervising their every move. Future studies could concentrate their efforts towards improving the algorithms used by AI systems to handle types of data formats efficiently thereby eliminating a major issue highlighted on what are the notable effects of AI in information management systems concerning knowledge accessibility organization and data management?

To sum up, the impact of AI on information management systems is vast and diverse as it brings advantages in efficiency improvement and better accessibility and organization of data. Nevertheless, ethical issues like safeguard of data privacy and enhancing transparency in algorithms are aspects to delve into. Tackling these hurdles can optimize the use of AI in information management while adhering to operational norms required in today's data driven society.

DISCUSSION

AI in Information Retrieval

The implementation of AI has revolutionized information retrieval in organizations by surpassing basic keyword searches. AI has significantly improved search accuracy, relevance, and user satisfaction in information retrieval systems (Boughanem et al., 2020). Machine Learning and Natural Language Processing technologies enable systems to interpret user intent, context, and semantic meaning, resulting in more accurate and relevant results. Google, as a leading search engine, uses BERT's algorithm to understand complex inquiries and context-specific meaning. According to Djoumnana (2023), the transformation by AI and expert systems has a major impact in information retrieval techniques. Nevertheless, several challenges remain, such as data quality, privacy concerns, algorithm bias, and high computational requirements. The initial investment cost in infrastructure and training expenses can be considerable for smaller organizations. Despite these challenges, information retrieval using AI proves very beneficial by reducing search time, increasing result accuracy, and boosting user satisfaction through more personalized and timely information. The continuous advancement in AI technologies is paving the way for more intuitive and intelligent user experiences.

AI in Classification Systems

In terms of classification systems, there are some future improvements that can be considered. In our opinion, we believe that we need to highlight the explainability and interpretability. Craig (2024) states that interpretability shows the human can easily understand the decision by machine learning model or simply put, the more interpretable a model is, the more straightforward it is to understand. Meanwhile, explainability attempts to describe why machine learning model made a given decision. Thus, by focusing on explainability and interpretability, we can develop methods to make AI classification decisions interpretable and allow users to know why specific categorizations were made. Moreover, classification systems can be improved by enhancing operational decision making, efficiency and ensure secure, ethical, including explainable AI deployment. It is hoped this recommendation can make the classification systems to be more reliable, robust and aligned with the future of the organization.

AI in Information Management Systems

It is now possible to state that developments in AI are more likely to redefine information management systems (IMS). The field of explainable artificial intelligence (XAI) has been a research focus in recent years because it seeks to make artificial neural information systems more transparent (Springer, 2023). It also captures data and relevant masses beyond people's ability or capacity, enhancing related activities such as classification, cataloguing, and quality assurance of data. This leads to improved handling and more informed decision-making (Davenport & Redman, 2022). A potential direction for future research involves the development of adaptive cognitive fit frameworks, which seek to synchronize AI systems with human cognitive processes to improve user interaction and performance in information management tasks (Arxiv, 2022). In the legal sector, equipping information management systems with AI, particularly for tasks like contract analysis and compliance checks, can enhance process efficiency and accuracy (Financial Times, 2023). The possible use of AI in education requires modifications in how information is delivered and managed, fueled by tailored learning experiences and the automation of administrative duties (The Times, 2023).

Lastly, addressing the ethical implications of AI deployment in IMS is essential. Future studies should focus on developing frameworks that ensure compliance with data privacy regulations while fostering innovation. This includes exploring how organizations can balance the benefits of AI-driven insights with the need for ethical considerations in data usage (Thakuri et al., 2024).

CONCLUSION & RECOMMENDATIONS

The integration of AI into information management alters the way that firms manage and govern their information as well as data. AI has brought a new meaning to effectiveness and efficiency of organizations up to date. For example, the IIR system that uses fuzzy logic and neural networks achieves a higher level of accuracy when processing vast amounts of information and increases the relevance of the results as well as the satisfaction of the users. Machine Learning and Natural Language Processing are two approaches within the AI perspective that have the possibility to manage a lot of input data during the processing phase, frequently resulting in a higher level of accuracy and fewer errors than it usually a human would make, which then makes the system more credible. For instance, Naive Bayes classifiers are applied to classification systems where automated tagging and categorization in a system reduce the human factor and likely errors in the system. It has been possible to make better decisions and properly manage information with the use of AI frameworks. When applying data automation, data that are sensitive are accurately identified and classified and their handling guaranteed to meet the governance standards when in use. These improvements underscore how AI is the key enabler of the changes to the way information is accessed, categorized, and utilized in organizations.

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