

EXPLORING THE INTEGRATION OF ARTIFICIAL INTELLIGENCE (AI) TO ENHANCE WEBOPAC

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Abstract : *Artificial Intelligence (AI) is poised to transform traditional library services. AI integration to enhance library services needs to be studied in a changing scenario. Natural Language Processing (NLP), Machine Learning (ML) and Semantic Search are some of the AI technologies that can be used to power WebOPAC so as to increase accuracy and to show relevant search results. Chatbots were used previously which were offering 24/7 service, which were offering basic services which was build using AI technologies. AI can transform library cataloguing, thus making it more efficient, accurate, and user-friendly.*

Keywords : Artificial Intelligence, Natural Language Processing, Machine Learning, Semantic Search, WebOPAC

Introduction :

The integration of Artificial Intelligence (AI) into library system so as to enhance the functionality of library catalogue needs to be explored. Speech recognition technology can be integrated into Online Public Access Catalogues (OPACs) so as to transform the whole library systems, making them more user-friendly and accessible (Rao, Swamy and Jain, 2024). As like the commercial counterparts with the development in technologies, libraries are exploring integrating voice-enabled features to enhance search efficiency, accessibility and user satisfaction of WebOPAC. Natural Language Processing (NLP) has further enhanced cataloging by enabling better understanding and extraction of information from unstructured data (Roy, Mallikraj, Moradia et al., 2024). Cataloging can be accelerated with the help of NLP so that automatic generation of metadata can be made for digital resources. Content-based classification can be achieved by making use of machine learning models, which ensures minimization of human error and guarantee consistent categorization. AI can help in the process of automatic generation of metadata for library materials as well as the tagging of new library materials, improving the efficiency of cataloguing process (Akinyemi, 2023). The voice recognition technology may be used to address a large number of users and libraries to attract and facilitate the library services to the next level. Voice technology is going to boost voice commerce which is in operation in projects like voice assistant, voice search and voice-enabled devices (Bajpai and Sharda, 2021).

Integration of Artificial Intelligence (AI) in WebOPAC :

Integration of Artificial Intelligence (AI) into library system including WebOPAC can significantly improve the functionality of WebOPAC by automating task like personalized recommendations and improved search operations. Artificial Intelligence (AI) enables users to conduct searches in natural language which can provide more accurate and relevant result by using Natural Language Processing (NLP), Machine Learning (ML) and Semantic Search. The integration of AI in WebOPAC will result in a more smarter and effective library system which can understand user purpose and context in addition to responding to inquiries as technologies develops (Indraji, Dominic and Veeraramu, 2024). In the following sections a detailed exploration of Natural Language Processing (NLP), Machine Learning (ML) and Semantic Search is provided.

Natural Language Processing (NLP) :

Natural Language Processing (NLP) which is a part of AI technologies can be used for Cataloguing purposes by creation of metadata automatically of digital resources. Library catalogue search performance can be improved with the help of sophisticated AI algorithm (Akinyemi, 2023). NLP plays a major role in the process of helping machines to understand human language, making spoken command easier to interpret. Advancement in the model like BERT and GPT has helped in improving language comprehension and analysis of emotions, which helps the OPACs to more accurately handle complex queries (Rao, Swamy and Jain, 2024).

Machine Learning (ML) :

Machine Learning (ML) especially deep learning can enhance speech recognition by continuously refining the system ability to interpret various speech patterns which can result in improved accuracy and adaptability (Rao, Swamy and Jain, 2024). Machine Learning (ML) has significantly transformed cataloging and classification system in modern libraries, which has enhanced their accuracy and efficiency. This can be achieved by means of training of algorithms to process and categorize vast amount of bibliographic data with minimal human intervention (Roy, Mallikraj, Moradia et al., 2024).

Semantic Search :

Semantic Search is a data searching technique that understand the context and meaning of a user's query, not just the keywords. Semantic search makes the use of technologies like NLP and ML for interpreting the user's intent, for considering relationship between words, synonyms, and context to deliver more relevant result than traditional keywords-based search (*What is semantic search, and how does it work?*).

Application of Artificial Intelligence (AI) in WebOPAC :

Artificial Intelligence (AI) integration has led to the revolutionary changes which

has improved the efficacy and efficiency of academic library services. AI has tremendously changed information delivery, organization, and search processes so as to make their services more effective and user-friendly. AI proves to be very helpful expedient to apply the knowledge and generate qualitative results. Libraries makes use of AI to improve access to the content. The libraries of the future will be greatly impacted by artificial intelligence and advanced computer technology, and the quality difference will differ from what our current work anticipate.

AI application can help in the library cataloguing processes in the following ways:

Automated Cataloguing :

By making it simpler for library users to find library resources, AI can help in the automatic generation of metadata for library materials and tagging of new library materials, thus improving the efficiency of cataloguing processes. This can result in the speeding of time it takes for the users to receive new materials and can considerably reduce the time it takes for users to receive new materials and lessens the workload for librarians.

Improved search and discovery :

Library catalogue search performance can be improved by making use of sophisticated AI algorithm. Even if any typing mistake or synonyms in their queries, user can locate materials more easily. By making use of AI in academic libraries can improve the availability and accessibility of library materials and enable staff members to respond to user's enquiries regarding AI use.

Content recommendation :

AI can also help with content recommendation, which can guide the users to relevant resources based on their perceptions and interest. AI can generate tailored recommendations by examining past search trends and user behavior, which can aid in the finding of library materials (Akinyemi, 2023).

Conclusion :

Artificial Intelligence can help the libraries considerably in improving its services. AI can make use of Natural Language Processing (NLP), Machine Learning (ML) and Semantic search to improve the functionality of WebOPAC. Application of AI in WebOPAC can be made for Automated Cataloguing, Improved Search and Discovery and for Content recommendation. WebOPAC forms the core of library services and thus integration of Artificial Intelligence (AI) to enhance WebOPAC can greatly help in improving the search process and can help in retrieving relevant search result. As well as integration of voice recognition technology can help library users considerably and offers ease in finding library resources.

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