

## Chapter 6

# Applications of Artificial Intelligence (AI) in Libraries

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### ABSTRACT

*Artificial intelligence (AI) has brought about new prospects for expanding research in all areas. The presence of artificial intelligence technologies in all spheres of work has made the future promising. The application of AI has contributed immensely to the provision and use of library information resources and has helped to achieve the goals and objectives of the library. Librarians need to be innovative in their thinking to stay relevant in their jobs because AI has found numerous applications in libraries ranging from book filing to book delivery. Its application brought about several new possibilities in the library such as connecting physical library information resources and electronic resources, and also associating video help with physical information materials and objects. The chapter discussed some components of AI, library services it can be applied to, the benefits of its application, as well as the challenges libraries face in the application of artificial intelligence in the library.*

### INTRODUCTION

Artificial intelligence (AI) is an aspect of computational science that is concerned with making machines provide answers to complicated and difficult issues in a way that humans do. Human cognitive characteristics are appropriated, modelled, and integrated as algorithms in a manner that computers understand and can process to give an output or result. In its logical approach, Artificial Intelligence is a neural network, which is a network of artificial neurons or nodes that mimics the human biological processes of neurons. It was developed in a system to imitate the structural organisation of the neural activities of humans. The neural network collectively generates informed decisions as they pass from one to the other. It models biological processes and makes best guesses as they process data. Neural networks are hence a certain form of machine learning system, which is an AI system. Artificial intelligence started as a field in the 1950s and its application to libraries started in the 1990s.

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Organisations and institutions must adapt to evolving technology to suit their end-user demands in the twenty-first century, which is an era of rapid transition and technological development. Artificial intelligence in libraries can be considered as a collection of techniques that enable machines to detect, understand, behave, learn, and execute administrative activities, providing libraries with cutting-edge technologies. Librarianship as a profession is known for incorporating cutting-edge technologies not just for information dissemination. Artificial Intelligence has become the new emerging trend for libraries. Artificial intelligence has proven to be a breakthrough for information-driven sectors such as law, health, commerce, the auto industry, etc.

Artificial intelligence is an extensive, comprehensive field of study that non-specialists often find it difficult to grasp without some basic knowledge. AI has brought about new prospects for expanding research in all areas. New systems are now being developed by researchers to mimic librarians' thought processes and exhibit human behaviours which were before impossible. ICT devices, computer systems, and other gadgets are progressively becoming technologically advanced and are built to reason and function as humans do, also with the perception of Human Intelligence (HI) getting transformed into Artificial Intelligence (AI). Tacit human knowledge has to be extracted and used to build an intelligent system (that is, to build an AI device, relevant characteristics and knowledge are first extracted from human experts, and these characteristics and knowledge are often heuristic in nature). Computer-based products and services are applied and used for various library operational processes as well as to provide different library services and produce output products. The application of artificially intelligent systems will help simulate human decision making. Library intelligent systems utilise AI tools to provide patrons with knowledge-based services (Asemi and Asemi, 2018).

Artificial intelligence is widely spread and should be adopted and applied to the library. The rate of its application in libraries, especially in Africa, is slow. The application of these intelligent systems can mostly be found in academic libraries through the use of various library processes in the library. The major impact of AI application shows its real significance on our society rather than in its technological exploits. The goal the application of AI seeks to achieve is to automate the tasks of human beings. Until lately, several individuals have begun to realise that machines can complete or execute activities as difficult as interpretation or self-driving cars (ALA, 2019). This applies also to the provision and use of library information resources and services, as artificial intelligence and its aspects can be of immense help to achieving the goals and objectives of the library.

According to the 2016 IFLA Trend Report, AI now has the ability to both enhance and replace existing library functions. Librarians need to be innovative in their thinking to stay relevant in their jobs. Artificial Intelligence was one of the emerging technologies of this century in the IFLA Trend Report. It is noted that the influence of artificial intelligence on libraries in the future will mainly focus on three aspects, which include: Browsers can optimise search results beyond term search and text analytics of web material; Real-time multi-language translation can be supported through integrated speech recognition, language translation, and speech synthesis; Cloud services can be employed for translating and identifying complicated and dynamic web material. Looking forward to the future application of artificial intelligence tools in the construction of artificial intelligent libraries, AI is mainly reflected in the following three aspects: Intelligent guidance service for space in the library hall; Intelligent sensing space construction should be carried out such that users can use mobile phones, wearable devices, and other mobile terminals to enjoy intelligent voice service, intelligent seat reservation, accurate positioning of information materials in the library; and intelligent navigation through the library, especially for

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