Chapter 8
Optimizing Library Services Through the Integration of Artificial Intelligence Tools and Techniques

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ABSTRACT

The use of artificial intelligence (AI) has transformed several industries, including research and education. Due to relevance and global competitiveness, in the present scenario incorporation of artificial intelligence in library workflow is inevitable. Libraries are changing in the age of information explosions to keep up with technological improvements and provide access to the greatest information while avoiding obstacles. This chapter provides a thorough description of the use of artificial intelligence (AI) tools and techniques in distinct sections of Library management and services. Creating devices that can imagine and work like humanoid brains is the aim of artificial intelligence. Artificial intelligence integration has the potential to improve library space intelligence and eliminate physical obstacles. The chapter offers a complete grasp of how AI could alter library infrastructure and services in the future, leading to better outcomes for readers, educators, researchers, and students.

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INTRODUCTION

The modern world is greatly impacted by technologies and individuals, radically changing our behaviors, emotions, thoughts, and ways of interacting and communicating. Rapid and significant technical breakthroughs are changing teaching and learning approaches at the same time, which is gradually changing the nature of education. Artificial intelligence (AI) is a discipline devoted to solving problems related to human cognition, and it has a remarkable impact on education.

The industry currently refers to the rapidly developing artificial intelligence (AI) technology as the fourth industrial revolution **(Park, 2017)**. In 1956, the official proposal of artificial intelligence was made at an academic meeting in Dartmouth, USA. Additionally, this symposium was acknowledged as a milestone in the development of artificial intelligence worldwide **(McCarthy, 2019)**. The fields of computer science, control science, information science, cognitive science, neuroscience, euro physiology, psychology, linguistics, and brain science have all contributed to the development of artificial intelligence as a comprehensive field. Its main goals are to imitate human intelligence activities, advance the science of human intelligence, and research the creation of intelligent computers or systems. Three categories of artificial intelligence exist: behaviorism, connectionism, and symbolism. Symbolism is a type of intelligent simulation that mimics intelligent human behavior using logical reasoning **(Pence, 2014)**. The learning algorithm and connection mechanism between one neural network and another are the fundamental idea of connectionism. Perceptual-action control and cybernetic theory underpin behaviorism. Problem solving, natural language processing, artificial neural networks, genetic algorithms, expert systems, knowledge engineering, artificial life, deep learning, intelligent control, etc. are now the most popular technical domains in artificial intelligence research **(Haibin, 2016)**.

There are four distinct phases in the evolution of artificial intelligence from 1956 to the present **(Kunying, 2017)**. In the realm of artificial intelligence research, a diverse array of technologies is explored, ranging from expert systems such as flight tracking and medical diagnostics, to natural language processing, exemplified by speech recognition and automatic speech output. Additionally, neural networks play a crucial role, particularly in pattern recognition systems for tasks such as face, character, and handwriting recognition. Furthermore, robots, encompassing industrial and consulting variants, are also integral components of this field's investigation. A few academics further categorize artificial intelligence into the following fields: machine learning, robotics, computer vision, natural language processing, cognition and reasoning, and gaming ethics **(Warwick, 2011)**.

There are numerous classification schemes and a fairly broad definition of artificial intelligence. Artificial intelligence can be classified into three categories