



Artificial Intelligence in Libraries: Transforming Services and Shaping the Future

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Abstract:

Artificial intelligence (AI) is one of the most recent advancements and applications of computers in libraries. It comprises educating computers to carry out activities that humans would deem intelligent. The ultimate objective of AI in libraries is to create technology or computers that are capable of thinking, acting, and even competing with human intelligence; this clearly has important implications for librarianship. Libraries are increasingly utilizing artificial intelligence. These include expert systems for referencing services, robotics that scan books and shelves, and virtual reality for deep learning. Despite the belief that it will drive librarians away from their users, artificial intelligence is likely to assist libraries achieve more rather than displace them. Their services will be of higher quality as a result. Artificial intelligence will significantly improve library operations and services while also making libraries more relevant in a fast-changing digital world.

Keywords: *Artificial intelligence; expert systems; librarians; libraries; librarianship; Robots; virtual reality*

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I. INTRODUCTION

Intelligence refers to the ability to reason, learn, and use knowledge when necessary. Making computers which are able to reason, learn and behave as people has fascinated a lot of people. From birth, humans possess the capacity to perceive, reason, act, and think. Numerous factors cause this capacity to increase and improve over time. Human intelligence is evaluated by the Cognitive Quotient that is established via a series of aptitude assessments that focus on various facets of intellectual function. Similarly, building intelligent machines which see, think, and act as people is the primary objective of AI. An indication of intelligence is the capacity for computers or other machines to carry out predetermined tasks in the face of unpredictability, observe their environment, and adjust their behavior in response to what they believe to be intelligence requirements. The notion that robots are intelligent is an anthropomorphic language because intelligence is determined by the criterion that an activity would seem clever if carried out by a human. Intelligent robots are not only capable of learning but are also programmed to do things more efficiently as time passes without explicit instruction because they are better at spotting and assimilating patterns than anybody else (Libris 2019). Artificial intelligence already has an impact on A lot of of our daily computing activities; most modern cellphones and computer systems have AI features, and we have used them without even recognizing they were smart gadgets. robots, machine learning, deep learning, natural language processing, autonomous or self-driving cars and speech recognition are examples of artificial intelligence in computers. AI is focused on perceptual recognition, in contrast to humans, which rely on deep cognition. strength and benefit of AI lies in computers' capacity to effectively identify patterns at speed and a size that is not possible for humans.

Societies have grown in recent years due to the growing need for access to information, and library is the first source of that access. The rapid development in software applications and computing technology, especially AI, has caused an important change in the format and characteristics of knowledge and information, necessitating a comparable availability of the same technologies for library today. If libraries don't begin to use the newest technology and rethinking the way they offer services and information, they run the risk of becoming outdated in the modern era. Artificial intelligence is used in a wide range of industries, such as commerce, education, video games, libraries, military operations, and medicine. The idea of creating machine learning systems for libraries was originally put forth in 1990. The knowledge-based services provided by intelligent library systems are advantageous to both library staff and patrons (Asemi and Asemi 2018, 5). Artificial intelligence is being used in library systems for a variety of tasks, such as subject indexing, shelf reading, reference and technical services, collection creation, retrieval of information, and descriptive cataloging. NIP and knowledge-based services are no longer relevant. Because of the advancements in AI programming, the establishment of a intelligent library is not just possible but also imminent. The development of smart systems that can comprehend and act as librarians -library robots- by experts and researchers in the discipline of AI lends credence to this assertion. An introduction that presents the specific problem under study and describes the research strategy.

OBJECTIVES

The aim of this research is to look into:

the implementation of artificial intelligence (AI) in library and its impact on improving library services, operations, and user engagement.

Discover the uses of AI in library management.

Explore how artificial intelligence (AI), including machine learning and processing of natural languages, are altering library services.

To identify the challenges and limitations of implementing AI systems in libraries.

1. RATIONALE FOR ARTIFICIEL INTELLIGENCE IN LIBRARIES

Libraries have evolved in terms of both form and content over the centuries. In antiquity, clay tablets and stones were used to communicate information, followed by papyrus and parchments in the medieval period, followed by paper and microform in modern times, and lastly electronic digital media in the present. Throughout history, libraries have collected and preserved a wide range of data assets to meet their users' information needs. the standard definition stated that a library included a physical space that stored materials for reading and other purposes. However, because virtual libraries lack physical walls and may serve users from afar, the meaning of a library has changed to emphasize the materials and services offered rather than the real facility. Thus, libraries have studied, integrated, and changed through to various technological advances of clay tablets, rocks, parchments, papyrus, paper, microforms, computers, Internet, digital library, cloud computing, and so on, in an attempt to satisfy the ever-changing information requirements of their patrons while remaining relevant in this rapidly evolving technological society. It's worth noting that AI is the most current technical innovation, with great potential and fascinating library applications. Because Corke predicted that intelligent machines (robots) would be an important innovation in this century, it is essential to examine this technology, both its benefits and drawbacks, in order to fully its rich advantages for creative and effective delivery of services in library (Corke 2015, 108) The primary justification in favor of utilizing artificial intelligence in libraries is that, unlike humans, they are less prone to making mistakes and can work around hours without tiring, allowing librarians to focus on other jobs. Finally, computers will handle documents from libraries quicker, more efficiently, and effectively, improving the delivery of library materials.

2. ARTIFICIEL INTELLIGENCE CONCEPTS

AI usually brings up images of thinking computers or robots. AI is a field of computer science which studies how computers acquire, understand data, and perceive, including character recognition, analysis of images, 3D perception. It also encompasses voice recognition, the creation of speech, natural language comprehension and usage, and expert systems, all of which are garnering more attention. as defined by Irizarry-Nones, Palepu, and Wallace, AI refers to the design and development of computers to perform tasks that humans require for intelligence, such as recognizing speech, making choices, visual perception, translating languages, conversing, and emotional feelings. Furthermore, it emphasizes representations of knowledge and heuristic reasoning procedures that are based on widely accepted assumptions and general rules (Ankit and Neelam 2023, 706). Artificial intelligence is further described as the field of science and technology of creating intelligent machines and software for computers, creating machines with minds studying mental abilities using mathematical models and explaining and emulating intelligent actions in terms of computational procedures (D. Divayana, et al. 2015). Artificial intelligence focuses on the principles and methods of symbol inference and machine knowledge representation. It is designed to do intellectual duties like applying reasoning, acquiring new skills, and adapting settings and difficulties (McGraw 2007, 23). To put it simply, AI is the method that gives computers or machines human-like intelligence, allowing them to handle complex problems in a way that is similar to humans.

Furthermore, artificial intelligence defines as the study and creation of computer machines or systems that demonstrate certain characteristics similar to human cognitive ability, including being able to acquire new tasks and concepts, think and draw practical inferences regarding a particular assignment, procedure natural language, understand and interpret visual scenes, and so on. The Turing test, created by Alan Turing in the last years of 1950s, can be used to assess a computer's intelligence. Despite yet, there are disagreements and criticisms about this strategy. But machines and computers can have strong or weak artificial intelligence. As shown in films, a computer with powerful AI can act and think like an individual, pick up from errors, and re-program itself to capitalize on prior blunders. Weak AI systems are designed to react to certain conditions; they are incapable of reasoning, learning, or retraining themselves.

3. TRENDS IN ARTIFICIEL INTELLIGENCE

Innovations in the area of AI include navigation systems, independent or self-driving vehicles, robots, detection of fraud and machine learning, the use of AI that enables computers and machines to acquire knowledge from data gathered from previous experiences, re-programmed, and enhance on themselves with no human intervention. Machine learning refers to how a machine learns automatically via repetitions and previous data interactions. Also, AI includes the following broad research fields: vision in computers, automatic computer programming, intelligent systems for control, artificial intelligence, intelligent computer-assisted instruction, NLP, organizing and decision support, robots, and speech recognition (Asemi and Asemi 2018, 10). AI become increasingly important in most areas of study and is expanding rapidly with the development of intelligent homes, Internet of Things. Surprisingly, AI is utilized to produce and assess data, The Washington Post covers elections using an AI system called Heliograf, and Watson from IBM's machine learning package offers assessments, data analysis, real-time scores, as well as captions for cultural and sporting activities. Artificial intelligence has a significant impact on learning since IBM created the Teacher Advisor, an AI tool created to help teachers create individualized lesson plans by suggesting the most effective mathematics lessons and then modifying the content to suit their specific class needs. Teacher Advisor's the library of free educational math materials has over 2,000 online courses, plans for learning, and videos that may be quickly searched to produce relevant results (Fine 2017). As more research is published, Semantic Scholar assists academics in searching for materials more efficiently and effectively by leveraging artificial intelligence and other AI approaches.

4. ARTIFICIEL INTELLIGENCE FOUNDATION

AI is built around four pillars: representation, searching, reasoning, and learning. These four key components must be present in any artificial intelligence systems.

Representations. is the smart system's internal explanation for the problem or relevant information. Representation includes knowledge of the structure for identifying problems as well as the architecture for manipulation. A person with a disease description and symptoms could serve as an example of a system of experts for diagnosis. It may comprise a symbolic 3D representation of an area for an operating robot.

searching. This is an essential part of AI systems used in solving problem methods. A strategy of search may modify depending on the task issue. A search in a database of previous problems and their answers to find the one that best suits the present one might be used as an example.

Thinking. This attempts to convert knowledge into problem-solving solutions. This is the primary source of the system's intellect. Deductive reasoning or inductive logic can be used to generate a hypothesis that most accurately answers the present issue and/or available information, or to infer a set of probable solutions to problems. Expert systems are a kind of reasoning in which challenges are solved by applying a set of norms or knowledge acquired from human skill to identify the laws of the problems.

Studying. Intelligent machines have the ability to acquire information, allowing them to adapt and gain wisdom from system information or history. Learning includes reorganizing the model, making the search algorithm, updating information, and improving logic.

5. APPLICATION OF ARTIFICIAL INTELLIGENCE IN LIBRARIES

Library has an interest in AI because technology has the potential to organize and make massive volumes of data accessible. Digital libraries are powered by AI. The objective of AI is to create computer systems which can think, act, and even outperform human cognition, which has obvious implications for librarianship (Marshall and DuBose 2024, 150) Artificial intelligence define as a biologically motivated technology which simulates human intelligence and information processing. It is not simply a smart system. Intelligent libraries automation systems leverage AI technology to offer knowledge-based services to patrons or staff. It is critical to differentiate library automation from AI in libraries. The first type extends above just Automate library operations, creating smart, rational machines which behave and think like librarians with minimal or no human intervention, whereas other type implies a certain level of automation in everyday operations at libraries. The invention will not eliminate librarians; rather, it would concentrate on laborious and time-consuming libraries tasks as shelf reading, allowing librarian to connect with public. AI systems is capable of replicating and hence replacing humans in libraries. Library management systems use artificial intelligence domains such as the processing of natural languages, expert systems , recognition of patterns, robotics... In a word, Natural Language Processing is method by which computers evaluate and generate natural language material. The purpose is to allow natural language as English, Chinese, French to be utilized as an object which systems of computers processes or a medium for interaction between users. NLP, or natural language processing, can be utilized by libraries to develop smart expert referencing or system of information retrieval which enable readers to interact with theme directly. A computer accepts normal language as inputs, assesses and processes it, then answers with the appropriate data. Subject indexing is other interesting application for artificial intelligence in libraries. To evaluate, examine, and propose the relevant words to use as indexing concepts or keywords in a given text, the librarian or indexer requires either technical expertise and intellectual insight. Any equipment or computer system capable of performing this function can be termed intelligent. Expert systems can manage references and subject indexing. Furthermore, professional systems are computer algorithms that simulate how individuals make judgments. They mix plans and tactics with specific problem-solving skills. Expertise is knowledge of a given sector or topic, substantial coverage or grasp of its challenges, and ways for resolving a few these issues. The first stage in developing a smart system for subject indexing is to extract and input appropriate information from a subject indexer or expert. The system will then use the knowledge basis and expertise to index content or, if appropriate, answer to user reference questions. Expert system is being used to tackle issues in a range of sectors as engineering, computer science, medicine. The library is another excellent venue for deploying intelligent and expert systems. (Asemi and Asemi 2018, 9) Expert systems can also assist with reference, management policy decision-making, categorization rule implementation, vendor assignment for library item purchase, and other tasks. Using a "knowledge base," that is a set of guidelines. The expert system consists of a pair of components: the information source and

the user interface engine. Expert system's knowledge repository contains both organized and unorganized content, as well as the interface engine subsystem iteratively decodes new information using logical rules from the knowledge base (Shanmugam 2017, 62). Expert systems can be programmed to operate in the library's referencing section. Because the Expert System's information database is created and maintained by a team of the most skilled and qualified individuals in the field, it can efficiently answer readers' inquiries more efficiently than a single librarian. They say that two heads are more valuable than one. The system of experts is intended to respond to the user's inquiries according to the key phrases or keywords contained inside it. If the user's request specific phrases or keywords, the system will react effectively. It is interesting to note that AI could be constructed to oversee a library's material or the growth of collections. Collection development refers to the choice, acquisition, and development of materials within the library, or just the process of quickly and affordably satisfying the knowledge demands of customers of the library, primarily through purchases or presents from sister organizations and other entities. Following the selection of books that a library would purchase, a list is often distributed to vendors and book dealers, who are asked to submit pricing according to format. The smart system can additionally collect data from previous experiences then offer a set of things to be acquired based on the merchants' or book sellers' historical performance, especially since the bulk of them are now accessible through their websites or emails. Machine learning systems can generate suggestions based on user preferences or previous purchases, lending credence to this assertion. This is a systematic approach to improving library content acquisition and user experience by recommending books, journals, periodicals, authors, and other materials (Romero 2018).

Artificial intelligence has also had an impact on information retrieval in the field of librarianship. The arrangement, organization, evaluation, preservation, retrieval and searching of information included in a library's materials, data centers, or the net are all examples of library information retrieval, that is concerned with recalling data or materials from a file or database. A range of information retrieval strategies were developed to deal with the massive volume of material held in library and make it accessible to users. Because of the rapid increase in the amount of new information produced nowadays, electronic and artificial intelligence retrieval techniques were developed and implemented to facilitate it easier to locate and access data from the library's collection, whether digital or paper-based (Libris 2019).databases, The OPAC, robots and search engines for the web, created expressly for delivery and retrieval of book are examples of Current information retrieval techniques used in library to provide fast and creative use of data. Currently, a lot of online search engines, like Google, include speech recognition technology. It enables readers to say phrase or word that they are looking for, and search engines employ the use of NLP to enter it into the search box before scanning and displaying the results. In addition, the technology of robotics is being used to eliminate space limits and give users fast access to information sources (Murphy 2015). The university of Technology, Sydney acquired huge computerized storage and retrieval systems, which serve as an example. The technology, which is based on robot cranes beneath the library, manages millions of densely packed book bins. When users make requests from the online catalog of stored documents, the robotic cranes keep and retrieve them. When an inquiry is submitted, the robotic locates automatically the term and delivers it to the correct library staff from the relevant container. The staff member then moves the requested book to the library's reserve shelf, where the patron can get it. The system's benefits include maximizing retrieval speed, approximately fifteen seconds from the time of demand till the item is delivered, minimizing space of storage, and reducing costs. AI is several applications in library services, including but not limited to:

Audiovisual content search, includes speech and OCR.

Interactive bibliographic training through a range of mediums.

6.clever entry points into internet resources,

Information environment is user-structured.

Services for people who are disabled using portable computer readers.

Services for smart document delivery

6. LIBRARIES WITH ROBOTS

Robotics is an area of AI that concentrates on motor abilities and perceptual. It additionally means the field of technology related to the assembly, operation, creation and maintenance of robotics (Adeyinka and Ajani 2022, 2). A Czech science fiction drama from 1921 was the first to utilize the term "robot" to designate artificial humans or androids. Following this, many works of robot fiction were published, including Isaac Asimov's Robot Series. These stories affected following novels and films, that revolutionized the public's perception of robots (Corke 2013, 120).

One of the most recent trends in the application of AI in library is the use of robotics for library operations. One feature of the internet era is the simplicity of access to the vast amount of knowledge that's available online. Nonetheless, printed books continue to contain a significant percentage of the world's knowledge. Finding these books in libraries requires a significant amount of effort and time (D. Divayana, et al. 2015, 6) . Robots capable of storing and retrieving books are currently being developed for example, created an upgraded automated library system for off-site shelving that removes books from shelves and delivers them to an off-site scan station. This approach allows full access to printed documents on shelves. The robotic system was created to provide researchers with 24/7 accessibility to off-site, printed libraries contents via the internet. Once the researcher selects the document they want to read or retrieve, the robot will initiate a series of operations to retrieve the requested item. The user will subsequently be able to explore, seek, then study the full-text created from the item's scanned photos due to a different automated system which opens the item then automatically turn pages utilizing optical character detection, scanners and programs of automatic indexing. BookBot innovation is another robotic book retrieval system. While this sort of technology has been known for a long and has been used in manufacturing, it has recently been utilized in library. bookBot is technology that immediately obtains them from the library's electronic catalog when patrons request them. Each bookBot's robot cranes will get the desired item from the shelf in minutes of receiving a request. When a patron decides to borrow the resource, the unit in charge will give it to them inside or outside of the library (Stone 2019). RFID tags are currently incorporated into libraries' collections. Patrons can rapidly check the library's collections with wireless and portable RFID reader devices and readers, as these barcode-based tags carry unique identifying identifiers for each book. Smart shelves equipped with numerous RFID antennae will recognize Once books are taken from or returned to their shelves. it can be utilized for automatically reading books off the shelf space and generate reports on which volumes are missing or not on the bookshelves (D. Divayana, et al. 2015, 2). Robot at the American Agency for Technology, Science, and Research Institute for Infocomm Research exemplifies how robots are being designed to scan and retrieve materials from library shelves. Despite their higher development and operating costs, these intelligent systems outperform humans in terms of accuracy. The technological parts will include generating a full map of the entire library so that the robot can navigate through it, as well as calculating and analyzing the distance that exists between the robot and items such as books, the shelves, tables, and people to anticipate changes in direction (Huang, Kurniawan et Ho 2015, 6100). The Westport Library in Connecticut has purchased two robots to assist patrons and students in learning computer programming and coding. In addition, two Aberystwyth College students, Sachiti Pasi William and Ladegaard Ariel, developed an artificially smart library catalogue by merging data from the university's OPAC with current robot technology. This robot was designed to vocally take in and handle user book requests, eventually directing the reader to the precise location on the shelf where the physical content is stored. The robotic cranes of the British Library's National Newspaper Building are directly

related with this. The robot can fetch newspapers from any time and date in a massive library of more than sixty million periodicals and newspapers spanning over three centuries of history.

It should be noted that archival organizations and museums are additionally investigating into how AI might improve the services they offer to tourists. The de Young Fine Arts Museum in San Francisco has purchased two telepresence robots that will enable visitors who have disabilities to explore the museum virtually. The BeamPro robots stand 5'2" tall and are on wheels. They are equipped with a screen, microphone, which is speakers, and camera that display a distant visitor's image, allow them to converse and interact with others, and allow them to observe the museum's exhibits. To pilot a BeamPros robot and take a tour of the museum, the visitor must first sign in to the robot utilizing their personal computer at home. While the camera catches a live video feed of the museum for visitors to view, the robot's screen shows a real video feed of the visitor's face. The robot has another camera that captures the surface of the floor, permitting visitors to navigate the museum and avoid obstacles. Unlike a pre-recorded video journey, this technology provides visitors with a physical presence as they explore the museum, as well as interactive features such as microphones, speakers, cameras, and screen that allow them to communicate with other visitors (Murphy 2015). The actual deployment of robotics and machine learning in museums, archival centers and libraries, as mentioned above, demonstrates how AI has enormous potential for use in information centers and libraries. The use of this technology improves the efficacy of library services by making it easier for the library to communicate with its users, whether it is used for library instruction, research data retrieval and distribution, or remote access to information material.

7. VIRTUAL LIBRARIES AND ARTIFICIAL INTELLIGENCE

Virtual libraries are electronic libraries which offer remote users with electronic access to widely scattered information resources. A library with no walls is a structured set of connections to different resources of information available via the internet. It is a set of digital resource s for information such as media, databases on the internet, electronic books, periodicals, and other forms of data. In addition to other services provide by library, virtually libraries often enable remote users to access knowledge resources in a range of types and subjects, like databases, e-books, e-journals, e-newspapers...via a gateway or online portal. The virtual library environment encompasses online resource access, virtual delivery of services, online patron-library communication, and other features. Patrons can access the library's collection of materials over the Internet via their private homes or offices. The only options to communicate with the library are by fax, email, phone and the video, audio, and the system of communication text accessible through the library's gateway. This library provides webinars, online video meetings, and tele training to keep their customers up to date on their offers and advancements. The term "digital library" may be utilized interchangeably or is closely related. The services supplied by virtual and digital libraries are completely automated. In addition, automation is a technique of employing machines to save people time and effort while simplifying tasks that humans do. The expression library automation relates to the utilization of computer systems to automating normal library functions including cataloging, registering users, book charging and discharge, shelf reading, and so on. Technology aims to develop methods and processes that lessen the need for human interaction in library operations. The primary goal of automation in libraries is to liberate up and personals so that they may make greater contributions to the spread of information and knowledge. Artificial intelligence is especially important in virtual libraries, where all

services and resources are digitized. The vast majority of automated systems for libraries include a number of features of AI in their operation and design, such as:

Expert systems automate term indexing and abstracting of digital resources.

Applying recognition of optical characters and processing of natural languages to transform and internationalize digital resources .

The digitization of printed materials. This involves transforming classic library resources into digital format using scanning or recognition of optical characters to assist retrieval and searching.

Implementing a decision support system to autonomously evaluate text.

Information retrieval through processing of natural languages and speech recognition.

Audiovisual resources can be automatically examined and retrieved by using systems with expertise and optical character recognition technology.

The use of data processing technologies to assist with tedious and clerical chores in serial management circulation control and technical book processing

Multiple points of access for knowledge sources and 24-hour delivery of services using advanced automated systems.

The opac and online database portals are two more electronic and virtual library systems that were created utilizing intelligence system methodology or algorithms. These systems transfer knowledge across several storage locations and intelligently govern a variety of processes, including data structure, characteristics, and description, using meta-control and management of memory.

8. Artificial Intelligence and Virtual Reality in Libraries

VR or Virtual reality refers to development of an artificial environment using computer technology. This computer technology uses numerous projected surroundings to create realistic sounds , images , and other sensations which replicate the feeling of being present in a virtual or fictional environment, which are sometimes combined with real-world settings. Virtual reality headsets use AI technologies as computer vision, image processing and speech recognition to immerse readers in a 360-degree virtual environment. Library has and yet to conduct much research into the opportunities of virtual reality (VR), additive reality and a combination of both . Libraries can enhance the user experience and enable remote or disabled visitors to virtually explore the library by mixing virtual reality, augmented reality and realism reality. A virtual reality headset allows a user to traverse the artificial library world and interact with virtual library resources by emulating every sense as possible as feasible, including hearing, seeing, touch, and smell, exactly as in a regular library.

Furthermore, by immersing the user in the environment of virtual library instead of simply seeing it on the screen of their computer, virtual reality enables user to have a digital presence (telepresence) in library. The de Young Fine Arts Museum in San Francisco uses a beamPros telepresence robot to allow people with disabilities to explore the museum online (Murphy 2015). Virtual reality is another option for customers who live a long distance away or are disabled. Virtual reality headsets are powered by AI systems, which have been used in a range of industries including engineering and science, medicine, aviation, and the military. In these disciplines, it is predominantly used for in-person student training, especially when risky or delicate duties are involved in real-world contexts. The library should not be excluded from enjoyment.

9. ADVANTAGES OF ARTIFICIAL INTELLIGENCE IN LIBRARIES

AI is programmed into computers or machines to reduce the amount of deaths caused by human error in war, risky jobs, road accidents, airplane crashes, fire explosions, and other catastrophes. Furthermore, in workplaces such as libraries, artificial intelligence enables individuals to perform more swiftly, effectively and efficiently. Expert systems and AI are employed to catalog and index library resources. The system can gather bibliographic records for books and categorize them suitably using neural networks and optical character

detection. Using normal language processing help to reduce barriers of language. For example, to study in China, one needs first learn Chinese. Their library's Natural Language Processing techniques can help overseas students in translating and comprehending Chinese. Furthermore, systems using processing of natural languages can aid in information search in multilingual databases (Asemi and Asemi 2018, 10). Furthermore, providing quality service delivery in library necessitates knowledge; hence, expert systems and AI will increase library service efficiency, minimize the percentage of person mistakes and defects, and most likely finish duties faster than humans. A study Artificial intelligence could assist library users find and retrieve contemporary media more quickly and efficiently, as well as expose them to new content they wouldn't have found otherwise. Besides to the entertainment and convenience value, library users performing study may benefit from the adoption of AI to recommend related materials by rapidly searching the library database (Romero 2018). In general, artificial intelligence systems are able to educate you, read to you, teach you, advise you, correct your errors, and gently address your various requirements. As a result, artificial intelligence holds enormous potential for information and library services. The following summarizes the benefits of AI in libraries:

AI in library improve research discoverability, resulting in increased research productivity for faculty members.

Time Bridge: timely services and information sources are available 24 hours a day, seven days a week.

Bridge in Space: With the introduction of digital transformation, digital copies, and robotic cranes which store and retrieve books from a small off-site storage facility, piles of books, magazines, bound newspapers, and other types of information objects have taken up less space.

Efficiency Maximization: This refers to the efficacy of library operations such as choosing materials and procurement, circulation, serial management, technical services, referencing services, , and so on.

Increasing efficiency by improving service delivery and eliminating human error in library operations.

Effort Minimization: Artificial intelligence technologies in libraries can lessen the amount of labor that librarians must perform to provide technical, circulation, and reference services, as well as serial management.

A more interesting and better user experience for library services.

10. DISADVANTAGES OF ARTIFICIEL INTELLIGENCE IN LIBRARIES

Despite its promise as a unique concept in the library system, artificial intelligence has limitations and the following points are the limitations of artificial intelligence (Adeyinka and Ajani 2022, 13):

Systems based on AI have potential to displace human tasks, increasing unemployment in the community. Librarians have been concerned about this for years. Librarians are concerned that intelligent devices which can store books, retrieve data, react to reference inquiries, and assist people would replace them.

Artificial intelligence systems could replace human jobs, increasing the community's unemployment rate. This has been an issue for librarian for many years. It is believed that smart machines capable of storing documents, retrieving knowledge, responding to reference inquiries, assisting readers would soon replace librarians, leaving them unemployed. Furthermore, because intelligent computers in libraries read digital materials faster than librarians and provide personalized insights, responses, and services, AI may pose a threat to librarians yet not to libraries. The idea of AI in library is likely unpopular with lot of librarians for this reason. Guion contends, however, that librarians are still needed because machines powered by AI would be unable to fully comprehend what a library user needs because search keywords can not always accurately convey the need or even uses how effectively their results

adhere to essential library rules of privacy, copyright, and intellectual freedom (Libris 2019).

Computers with artificial intelligence having the potential to fail and do activities for which they were not prepared. If the algorithms that power AI systems begin to cause problems, there is a risk that they would distribute erroneous information.

Artificial intelligence technology may be exploited. Because a robot now performs activities such as cataloguing and categorization, librarians may become overly reliant on AI systems, losing sight of the essential processing required for library operations. Destruction on a massive scale.

Human touch is lacking. rather than interacting with a machine, some users choose to communicate with others and express their emotions.

11. CHALLENGES OF USING ARTIFIACIAL INTELLIGENCE IN LIBRARIES

The majority of libraries do not now use artificial intelligence technologies. The following limits apply to the usage of AI system in library:

Librarians lacks the expertise in technology to apply and control intelligent technology.

Insufficient funds to develop and purchase artificial intelligence for library. The sort of system which libraries may purchase or construct is constantly constrained due to hardware and software budget constraints.

The cost of developing and sustaining AI systems in library is significant.

In libraries in general, particularly in developing countries, AI systems are powered by inconsistent power sources.

Smart systems lacked the common core of human information, drastically limiting the kinds of activities they can carry out.

The amount of technical and effort knowledge necessary to develop AI systems for library. The strength and complexities of the system are highly related to the amount and kind of labor necessary to develop a smart library system. This implies that the effort needed for maintaining a system grows with its amount of intelligence. Libraries now lack the requisite trained staff as well as the pricey development tools or processes required to create complicated intelligent systems.

Few automated library firms use artificial intelligence professionals. Because of its complexity, AI demands specialized knowledge that extends far beyond the development of typical library automation systems. As a result, before any significant, prolonged research on the topic of AI in librariy may be completed, extra personnel in that area will need to be hired.

12. Libraries of the Future

As seen by the creation of shelf reading robots, libraries in the modern day will soon be overwhelmed by the utility and impact of emerging AI-based technologies. Like the creation of electric bulb, which at the time seemed almost miraculous, Nobody may have imagined that it would lead to the invention of TVs telephones, radios, computers, and other technology devices. AI is a relatively young quasi-magical phenomenon. We currently have no idea how AI will be employed in library and other aspects of our life, much like we did in the early days of electrical development. In future, AI will change many aspects of life, including the library. When machines can read books, what will happen to librarian and library employees? was an important question raised by Bourg (2017) and utilized GeoDeepDive, an AI-powered tool that geologist extract informatio from tables, text and pictures in publications and webpages, as an example. The time is changing! Librarian can not be required to chek library books to obtain data for advising patrons or making judgments because a machine might have read every book and be more adept at analysis and decision-making. We won't have to spend time on library computers to locate the answer once AI can do it for us in a few seconds. Additionally, we wouldn't seek information from a human librarian when artificial intelligence may offer a superior solution in a short time (Johnson 2018) . All library services

will be fully digitised in future. In the future, library will use intelligent devices and robots to do a variety of functions, including cataloguing, categorization, circulation (registering, charging, and discharging materials), reference services and organizing, and library data generation. The library as we currently know it will be significantly changed by artificial intelligence. A perfect librarian who answers users' reference questions using algorithms for natural language processing, recognition of speech, and neural networks is promised, along with efficient, effective and fast processing of library sources and cutting-edge service delivery to clients, even from far-off places. Instead of ignoring new technology, libraries in the future will react to it and adapt to it (Stone 2019) .

However, there is an important questions must be asked about how librarians, scholars, and others can develop and use their skill set to guarantee a smart data system that incorporates the core values of libraries, including social justice, diversity, intellectual freedom , confidentiality and which encourages creativity, creating knowledge, and encourages human learning ncluding how library may develop an interface between readers and AI-generated information to make sure it is relevant and correct; and how texts can be well discovered by both machines and humans, particularly Academic communication, so which smart machines may be trusted to provide intelligent responses to questions. ALA President Garcia-Febo has advocated for the integration of AI in national conversations and the professional agenda of the library profession in order to investigate and address these and other concerns. The present development of AI, including machine learning and vice assistants, has already gained acceptance and been used in libraries, the President continued, adding that it is still unknown in many areas. In its early stages, library is using artificial intelligence to teach abilities in critical thinking as programation of computers, information literacy, how to create questions for these computers and evaluate their responses, and how to employ robotic cranes to access information resource. All of these significant initiatives are being implemented in library operations across the globe, and they point to a broad application of AI that will impact libraries going forward. The argument is never about either Intelligence or libraries, instead it's about how can library use technologies to offer user communities the best services possible.

CONCLUSION

In its early stages, library is using artificial intelligence to learn critical thinking abilities as computer programming, information literacy, how to create questions for computers assess their answers. and how to use robotic cranes to obtain data sources remotely. All of these significant initiatives are being implemented in library operations across the globe, and they point to a broad use of Intelligence that will impact libraries going forward. As a result, the argument is seldom about library or AI, but rather about how library can harness technologies to give user communities the best services possible. The numerous potential advantages AI holds for librarianship will surely be shown when it is finally accepted and integrated into library operations. Like many new technologies, AI is also viewed by librarians as a complement to the human element in libraries. Humans are vital to libraries, and artificial intelligence will not soon jeopardize the connection between a library and its patrons.

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