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2 Current Directions for Artificial Intelligence in Libraries: An Introductory Overview

"Is AI already in our libraries?" is the question posed by JuJa Chakarova in the first chapter of this section on current directions in AI for libraries. And what is the answer? In February 2024, a Google search using the keywords "artificial intelligence" AND libraries yielded 400 million results. The numbers provide an unequivocal answer: absolutely. However, the picture is multifaceted and complex, and not without uncertainties.
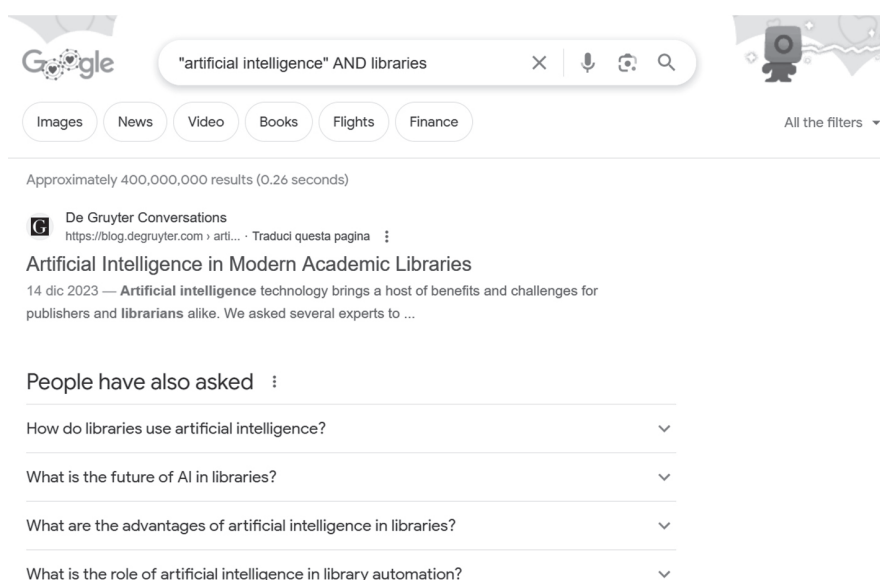
Figure 2.1: Screen shot of Google Search on Artificial Intelligence and Libraries, February 2024

The Impact of Artificial Intelligence on Libraries: Challenges and Opportunities

The recent whirlwind in the field of AI and its pervasive evolution seem to have ended, once and for all, the alternating springs and winters of AI developments witnessed over the past 70 years. The ongoing rapid advances by no means exclude

libraries. Are libraries perceived as isolated paradises that will remain unaffected by the rise of AI? Or are libraries remnants of the past doomed to decline and disappear, unable to enjoy the benefits of AI? It depends on whether one wishes to highlight the many risks or the enormous opportunities of AI.

A journey has certainly begun, but to understand and explore the potential for AI in libraries, one must first focus on the overall scenario of AI and the scope of the AI revolution and its impact on the world and society. Where is AI headed and how should it be directed? The various domains of AI and the applications that can significantly enhance available knowledge and access to it impact on the founding purpose of libraries. It is necessary however to appreciate the vast changes occurring not only in the technology but in the world at large before examining the import for libraries of AI. Engaging with the structural turning point caused by the ubiquity of AI exposes libraries to risks that are fundamentally similar to those faced by society as a whole. But the perceived risks of using AI in libraries might include the potential undermining of the essential defining characteristics and fundamental values of libraries which emphasise the absence of discrimination in knowledge access, the prevention of bias in access tools and knowledge content, respect for privacy, and due regard for intellectual property rights. AI might endanger the basis of the very existence of libraries.

Libraries have never been exempt from deficiencies and inadequacies in relation to implementing their declared values. For example, bibliographic classifications and subject headings in catalogues and databases bear witness to widespread bias. However, the compounding capacity of AI can lead to an exponential amplification of any bias already present in knowledge content when constructing responses to information searching. AI, through its unparalleled capacity for penetrating multiple layers of knowledge, has a greater potential to encroach on the right to privacy than in the past. AI can also engender intellectual production of new content in a manner that makes it difficult, if not impossible, to understand or trace improperly used sources. Simultaneously, AI presents itself as a fertile wide-ranging means of enhancing in previously unimaginable ways the core functions that define the *raison d'être* of libraries through augmenting discovery, access to, and use of available knowledge, the creation of user-friendly dialogue tools, the provision of personalised response to enquiries, and delivery of uninterrupted service availability.

Navigating the Future of Librarians: Adapting to the Age of Artificial Intelligence

The inexhaustible and as yet unknown potential of AI brings forth another spectre: that of the redundancy of the librarian, whose role as an intermediary between the user and knowledge might be better fulfilled by artificial intelligent agents. However, the proactive presence of library professionals is crucial to ensuring that AI developments remain aligned with the basic principles and values of libraries and guaranteeing the quality of AI-generated outcomes. On the one hand, librarians must work for useful applications of AI in the library even though there might be a lack of sense of any opposition to the penetration of AI in the library. Opposing the integration of AI into the work of librarians to avoid the risk of librarians becoming superfluous would be futile. History demonstrates that no profession has survived when its necessity or utility has waned with the emergence of new ways of meeting service needs. Paradoxically, if the adoption of artificial intelligence were to lead to the extinction of the librarian profession, the librarians themselves should make every effort to ensure that what replaces them outperforms their own performance.

The mere preservation of the species is not a worthy aspiration for a profession in the service of the community. But the disappearance of librarians is not currently on the horizon.

The work of libraries and librarians remains essential, not only to ensure the development of AI applications that uphold the library's core values but also to provide the sustenance and innovative directions required by libraries. Libraries continue to be custodians of an enormous wealth of knowledge not all of which has been digitised and libraries must emphasise the need of transferring knowledge to new formats to fuel AI processes. The creation of the digital body of knowledge is an ongoing task, which has its roots in the past, is far from complete and must continue. The AI "methods… promise enormous potential for the (semi-)automated curation of digitized cultural heritage in libraries, archives, and museums, as well as for the computational analysis of cultural heritage data" (Neudecker 2022) and provide new and diverse opportunities for responsible and effective curation and stewardship of cultural data which will reveal additional content and ensure quality service delivery.

Unlocking New Directions for Established Functions and Skills

AI offers enhanced opportunities for adding value to the information produced by libraries in the course of their functions. Existing data available on collections and their use, inquiries, consultations, loans, requests for materials not held, user evaluations, along with the metadata in catalogues and databases, and the development of collections, to name just some of the areas. The availability of vast quantities of data of this kind, on a large scale, with due respect for privacy, could potentially serve as valuable material for AI applications. As noted futurist David Weinberger has observed in an interview with Zaccuri, manipulation and analysis of such data using AI would benefit not only the libraries themselves and their interactions with users, but also contribute to a broader spectrum of knowledge about communities (Zaccuri 2021).

With regard to reading skills and digital literacy, libraries have both the responsibility and the capacity to play a crucial role in narrowing the knowledge gap in society concerning the tools, applications, opportunities, and challenges associated with the pervasive influence of AI in people's lives (Ylipulli and Luusua 2019). Many lack awareness of AI developments and their impact, while AI is shaping people's lives in an ontological way and changing the very nature of being (Escobar 2018).

An open arena for the involvement of libraries and librarians lies in their interaction with commercial producers of AI. Libraries and librarians can take the lead in shaping market trends in AI applications, steering vendors in the right direction by providing standards and guidelines and focusing on applications that are not only effective but also ensure transparency, scalability and accessibility (Cordell 2020, 63–64). Libraries through taking proactive stances in relation to AI developments can safeguard equal opportunities for smaller institutions and peripheral communities. Ensuring equity is even more critical than the development of specialised implementations. It is easier for large, academic, national entities to make appropriate and useful AI projects and the examples presented in the book prove this. The difficulties are mainly for small or marginal libraries. The successful interventions in AI and case studies within large libraries and well-endowed institutions explored within this book nonetheless provide models for others to follow.

Resource Challenges in the Age of Artificial Intelligence: Expertise, Funding, and Competition

The availability of resources and their allocation are critical to the successful development and implementation of AI in libraries. Resources encompass the requisite expertise, which is not always available in libraries, particularly in smaller institutions. Training programmes, both within libraries and in academic institutions responsible for training or educating new professionals, can address this need but are not effective solutions when staff numbers are limited, and/or when an information technology (IT) team presence is minimal or absent.

Resources also include the funds required to execute specialised projects tailored to specific contextual needs. AI application projects are often intricate, long-term, subject to technological evolution, and therefore expensive and challenging. Securing approval from decision-makers, even within well-funded institutions, can be difficult. For simpler implementations like chatbots, the availability of numerous open-source resources facilitates the process but does not replace the work of specialists who may not be available locally.

Another issue is the highly competitive market for specialised expertise. Libraries and their parent institutions play in the AI space at a disadvantage, due not only to limited financial resources but also to the regulatory constraints they face. They may not be able to recruit appropriate staff because the governance regimes may result in longer decision-making timelines compared to private companies. Recruiting appropriate staff can be difficult with long lead times because of bureaucratic obstacles.

But libraries have at their disposal a traditional and well-established tool that has proven indispensable and successful in addressing various challenges: cooperation. Collaborating on specific projects maximises the resources available, pools expertise and knowledge, provides opportunities for multiple implementation, extends outcomes and benefits many libraries and their communities. Presenting a united front in interactions with the marketplace provides greater strength and credibility to libraries as potential buyers who prioritise innovation while being mindful of product quality and user rights. Converging on common positions in dialogue with the political institutions responsible for shaping AI regulations ensures, in the midst of competing interests, an additional voice for advocates of AI developments that do not result in rights violations and increased inequity (Bradley 2022).

The Contributions in this Section

This section undertakes an examination of AI adoption levels within libraries, identifies associated challenges, and proposes possible approaches. Delving into ethical and regulatory dimensions alongside organisational and economic facets, it offers insights into navigating the complexities inherent in AI integration. Juja Chakarova explores the historical progression of technical development across industrial revolutions, highlighting the current advancements in communication and computing that have led to ubiquitous computing, robotics, and AI, with a focus on major subfields of AI and its potential impact on traditional professions like librarianship, emphasising the need for investment in new skills and ethical standards. Mojca Rupar Korošec addresses the importance of establishing open ethical and legal frameworks for AI, particularly in library environments, to tackles issues such as user privacy, transparency, and bias, with a particular focus on developments in the European Union. She also refers to international initiatives like the International Research Centre on Artificial Intelligence under the auspices of UNESCO (IRCAI) in Slovenia and the Global Partnership on Artificial Intelligence (GPAI) promoting responsible AI development globally. Bohyun Kim provides examples of AI applications in libraries and discusses the slow adoption of AI and machine learning in libraries and archives due to experimental use and limited deployment of machine learning applications, highlighting the challenges such as cost implications and the need for specific expertise and infrastructure.

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