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Transformative Librarianship in the 21st Century

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Abstract –

This work looks at how Library and Information Science (LIS) has changed over the 21st century and what has become of the roles of academic librarians. After examining primary documents and literature, the authors concluded that librarians have become indispensable to teaching, research, and innovation. The change was necessitated by the very rapid, data-intensive, open-science, and technology-driven world. Few would argue that librarians still only handle collections; they have become collaborators. Besides that, the review highlighted several emerging roles that librarians could assume. As an example, academic librarians can evolve into Research Data Management Officers, Scholarly Communication Specialists, and Technology Facilitators/Digital Skills Trainers. These are ways through which librarians can influence the knowledge process, and they end up being creators, organisers, distributors, preservers, and re-users of information and research data. To put it briefly, librarians today are the leading players in the entire knowledge management cycle. They are the ones that enhance transparency, reproducibility, open access, and digital literacy. Faculty and students are not only beneficiaries but also guided through the complicated worlds of information and technology. The paper contends that in the current world, the library profession is centrally situated at the intersection of information, technology, and user needs. By upgrading themselves and focusing on the future, they not only strengthen academic institutions but also celebrate the spirit of fair access to knowledge.

Key Words: 21st century librarianship, Academic Librarians, Research data management, Scholarly Communication, Digital Literacy, Library and Information Science

INTRODUCTION

The world of libraries has changed dramatically over the decades, from a traditional print-based environment to a dynamic, digitised one. Previously, people considered libraries to be silent spaces where books, journals, and manuscripts were stored, retrieved, and physically located. A librarian's work was a custodian-like task: to organise collections, update catalogues and help users find their way through piles of printed materials. All of this has changed significantly with the arrival of computers, the Internet and the influx of digital resources, which have now transformed libraries into busy knowledge centres, improving and promoting lifelong learning. The first big wave of transformation began with the automation of libraries, from manual cataloguing and publication systems to integrated library management software. This increased efficiency, but it also prepared the ground for moving the library into virtual space. With the emergence of electronic resources such as electronic books, electronic journals, online databases and institutional repositories, the scope of libraries expanded well beyond physical walls. Information has become instantaneously available worldwide. The role of a librarian has not yet been that of a gateway to information, but rather that of a facilitator of access and digital literacy. The use of cloud computing has taken library operations further by providing continuous data storage, resource sharing and collaboration services across institutions and even continents.

In recent years, materialising technologies such as Artificial Intelligence (AI), Machine Learning (ML), Data Analysis, and the Internet of Things (IoT) have created a new era of "smart librarians". AI-driven search engines, automated metadata generation, chatbots for user assistance, and predictive analytics for collection development reinvent how libraries serve users. Furthermore, social media platforms and mobile technologies have enabled librarians to reach communities in real time through services, information dissemination and the creation of a participatory learning environment. These technological advances have also redefined the professional identity of the librarian. Today, librarians are not only responsible for printing materials but also managers of knowledge ecosystems—curators, connectors, and creators of information resources in physical and virtual environments. Data curation, digital preservation, information architecture, and content management—all of these are today part of the library toolkit, as is cataloguing. The role of the librarian now includes teaching digital literacy, supporting research data management, and encouraging open access and open educational resources.

Librarianship in the digital era is not only about preserving collections; it also provides users with access, authenticity, and the ability to navigate a constantly changing

information environment successfully. Librarians are at the intersection of technology, education and human interaction – building bridges between information and consciousness in a world that is constantly shrinking even as information accumulates. To continue their vital role in the formation of knowledgeable, just and knowledge-oriented societies, librarians must constantly learn, adapt and innovate.

EVOLUTION OF LIBRARIANSHIP

Libraries began as stores for books, trade documents, biographies, tracts, agreements and such common documents of the ancient world. Kings, royal and religious figures, and other rulers owned ancient libraries. Although most old libraries cannot be used to make up today's libraries, they serve the common purpose of preserving knowledge and providing information for social development (access was highly limited to a small number of select individuals). From ancient times to today, the primary purpose of the library has not changed: the creation of information. Although today's libraries provide access to information in various formats and communicate through various media, the main objective of libraries —namely, creating access to information —has not changed. This does not mean that the library is static, far from it. The library is a strategic organ of society that evolves with society (Aiyebelehin, 2012).

The evolution of libraries from traditional to digital access has led to changes in practices and technologies, which still shape their future (Aras et al., 2023). This study combines key milestones that guide libraries toward the digital world, explores significant advances in library practice and access, and highlights the lasting consequences for all libraries. The traditional, automated, hybrid, and digital phases are described, along with significant technological changes that have transformed library operations, as well as standard practices for implementing guide technology. Supporting ICT infrastructure and standards requires consideration of necessary hardware, software, metadata standards, and interoperability protocols.

The internet has changed the entire process of information discovery and retrieval in libraries, and with it, many challenges arise, such as digital curation, metadata creation, and interoperability. The transition from collections-based to subscription-based acquisition models affects not only library financing but also resource management. Current licensing frameworks and e-resource management are essential for library operations as e-resources are becoming more and more significant. Moreover, the preservation and access of both legacy and new digital content are crucial, especially as ownership is being replaced by access. Libraries are required to enrich their core skills with information literacy, data stewardship, and the facilitation of institutional research reuse.

Fair access to technology and the digital divide are two significant policy issues. Economic disparities, disparities in access to digital devices and connectivity, and disparities in digital literacy are among the barriers to universal participation in the knowledge society. To address these problems, effective strategies must prioritise social equity and digitally mediated learning. This entails improving library engagement and promoting inclusive access. Digital projects are also constantly affected by issues related to intellectual property, licensing, and financial limitations. Surveying developments in the Internet age, three case studies—public libraries, academic libraries, and special libraries and digital archives—illustrate evolving services and responses. Public libraries have ceased charging access fees for electronic services, established an expansive range of Internet- and technology-based programs, and created materials to assist individuals with online job searches. They take charge of selecting and acquiring the relevant high-quality information resources—whether printed books or digital databases—tailored to their communities' needs. This work often means teaming up with faculty members and other library staff. Librarians also make a point of reaching out to the public, explaining what the collections, services and advantages are, thereby supporting education, culture and even a sense of identity. In addition, they work side-by-side with administrators, government agencies and other stakeholders to keep pace with the shifting information landscape (Dold & Jayousi, 2018). Special libraries and digital archives have adopted diverse practices and organisational structures to govern access to public-domain collections, retain print-based preservation copies, identify and recommend suitable repositories for audio files, and advocate for sustainable formats and digitisation specifications.

HISTORICAL MILESTONES IN LIBRARIANSHIP

Since ancient times, librarianship has experienced revolutionary changes interspersed with turning points that have produced a variety of library types, such as automated and hybrid archives. It is acknowledged that

the most recent and significant stage is the transition from traditional to digital libraries. Today, early pivotal moments, innovations, resource formats, and collection protection efforts remain significant. In addition, some people, innovations, and coordinated endeavours have left lasting effects. Although qualitatively different from previous developments, the shift from traditional archival practices to hybrid and then digital libraries demonstrates a continuity of thought that is crucial to collection stewardship.

THE DIGITAL ERA LANDSCAPE

The digital era is characterised by unprecedented technological, social and information changes that continue to redefine lives and landscapes. People find themselves in situations that were not planned (Koroluk, 2011). Online service providers must discover and meet evolving consumer requirements. The university-age population is an example of individuals who interact more deeply with technology than previous generations and have adopted new and different forms of online learning. Knowledge-sharing platforms such as YouTube, Wikipedia, podcasts, and Twitter are increasing. Many learners feel driven to engage in self-directed learning and, as free agents, choose the platforms, tools, and topics that best suit their goals. A study of self-directed learning and online service expectations among computer-savvy learners focuses on two significant questions. How has the digital era reshaped expectations for online services of self-guided university-age learners? What service attributes are considered essential for university-age self-led learners in the digital age landscape? The theoretical lens of the Digital Era landscape provides a framework for studying talented students who are making significant changes to their lives and are a crucial corner of the educational client base. The analysis summarises three aspects of the landscape and then explores the expectations for self-directed learning and online services.

Characteristics and Implications for Learners

This period has come to be called 'digital age' because of the influence of technology and its innovations on the economy, business, and socio-culture (Arewa, 2022). Being "digital natives" is less important than pedagogical practices in determining adequate digital literacy in academic settings. Although most people have access to information and communication technologies, how they are significantly taught influences how students view the value of these tools in the classroom. Intentional teaching approaches are required because of the discrepancy between perceived and actual digital proficiency. Digital-era learners, known as the Net Generation, display distinctive traits and specific learning patterns that shape contemporary education. With their easily assimilated digital content, advanced technological capabilities, and integration of digital technologies, the learners are profoundly technologically advanced and can efficiently utilise them. Exposure to technological tools during their formative years has a significant impact on the brain. The learners are digitally transported to the age of advanced technologies to integrate them into education. In conclusion, technology education in a digital age is the only option available, given the need for technology education and remote education. Learners need interactivity, seamless, flexible solutions that suit their requirements, and collaborative education; these are the only options available in technology education and remote education (Patterson, 2012).

EMERGING ROLES OF LIBRARIANS

Today's libraries are no longer just places where people go to study, read, and borrow books. Libraries have become centres of knowledge, both in the physical and digital realms, where people come to learn, access, and share knowledge. As a result, librarians' roles have also evolved. Their new roles encompass teaching digital literacy and virtual services, serving as community partners, managing databases, and facilitating knowledge within the community—these new roles in librarianship result from a shift from library science to library and information technology. Because of the rapid growth of information and communication technology, librarians will need to acquire managerial, technical, entrepreneurial, and information literacy skills to remain relevant. Libraries and librarians have become key stakeholders and drivers of change in the information society (Momoh & Folorunso, 2019).

KNOWLEDGE MANAGER: STEWARDSHIP OF INTELLECTUAL ASSETS

Knowledge management informs library science practice as the main activities of library and Information Science (LIS) professionals—choosing, getting, arranging, keeping, and passing on information—correspond closely to knowledge management system activities as knowledge managers, LIS professionals practice knowledge auditing (through user studies and collection assessments), knowledge capture (resource selection, acquisition, and documentation of expert knowledge), knowledge

(organisational) expertise (their primary skill), and knowledge sharing (through circulation and reference services). They also help to apply knowledge by improving services through user feedback, making knowledge management a way to respond strategically to user needs and information environments. More than anything, knowledge management activities enhance collaboration between LIS professionals and other units (Oyedokun et al., 2018).

As information and knowledge institutions, libraries hold extensive knowledge in the form of organisational policies, development plans, reports, formal and informal guidelines, standards, configurations, procedures, and tacit knowledge. Academic library service models have shifted from custodianship of resources toward addressing knowledge dissemination, management, and intellectual capital concerns (Yaacob et al., 2010).

The term "knowledge manager" has appeared in some companies and institutions alongside "knowledge management" and "knowledge officer." Its functions include scientific, technical, and business decision-making based on operational databases and forecast knowledge of present and future phenomena and possibilities. The title knowledge manager has become popular as a pseudo-equivalent of a repository manager, archivist, and librarian who organises and distributes information on how to access her/his library resources and services within information management. A knowledge manager, unlike their colleagues, is not primarily concerned with storage and dissemination, but rather with making knowledge known, accessible, and therefore usable for promotion and efficient sharing towards effective use.

DIGITAL CURATOR AND CONTENT STRATEGIST

Data curation has emerged as a critical new area of responsibility for researchers, librarians, and information professionals in the context of digital libraries. It tackles the difficulties brought about by the increasing amount and variety of research data that need to be processed, stored, and made accessible to the general public and academic communities (Tammaro et al., 2016).

Digital curation consists of a series of functions based on the deliberation of the genesis, origin or creating software for the collection of materials to select, and choice of the appropriate storage media to preserve the collection in its environment. These functions include the conception of a digital object sought for the institutional web pages, archived e-mails for long-lasting conservation and potential access by time-specific researchers, and files regarding the history or evolution of the installation or construction of a very special software. Users also have to be offered similar support in the establishment of their own collections for historical or artistic reasons. Digital curation is distinct from documentation or specialized document collections, in which the collections remain physically separated and stored in specific repositories, avoiding mixing with the librarian files implementing a broader view of the collection's non-exclusive nature.

INFORMATION LITERACY EDUCATOR: FOSTERING COMPETENCE IN AN INFORMATION-RICH ERA

Information literacy (IL) is an important part of education in the 21st century. It is becoming more widely acknowledged that faculty and librarians must work together to ensure that students get information literacy skills relevant to their particular fields of study. Because neither instructional faculty nor librarians can successfully teach the entire research process on their own, this collaboration is essential. Academic literature often documents successful collaborative projects (Kovalik et al., 2011).

In the current information-abundant age, academic library workers are stepping to the forefront as educators of information literacy (IL). Rather than sticking to the traditional "one-shot" instruction, library workers are undertaking educational development activities for learners and educators in higher education. Work in the Library and Information Science (LIS) field recognises that many of these activities focus on supporting educators in teaching IL, as it entails more than teaching research skills and includes critiquing information. Librarians are seeking to implement sustainable, scalable IL programs for a greater number of learners by adopting a faculty-centred model through workshops, asynchronous courses, community of practice, and course redesign activities. Even when these activities are not described as faculty development, the aim is to enhance faculty members' abilities to teach IL and to elevate IL teaching across courses and the institution. This shift from working directly with students in one-off sessions to working systemically with faculty enables academic librarians to have a much greater, longer-lasting influence on students' IL competencies (Hammons, 2024).

DATA MANAGEMENT AND RESEARCH SUPPORT SPECIALIST: ENABLING REPRODUCIBLE SCHOLARSHIP

In academic libraries, librarians' roles now span the entire academic research cycle, including the new aspect of research data management (RDM). Librarians enhance data transparency, reproducibility, and reuse, and their roles in research data management help open science further advance. Academic libraries will not alter their missions to include research data management; rather, academic librarians will be able to take on additional functions, such as data workflow management, data literacy training, and scholarly communication (Partlo et al., 2015).

SCHOLARLY COMMUNICATION EXPERT: ADVANCING OPEN ACCESS AND DISSEMINATION

The evolving role of an academic librarian is to support and shape the institution's entire ecosystem of scholarly communication. This includes managing and promoting institutional repositories to raise the profile of institutional research; advising faculty on scholarly publishing models, particularly open access; and providing advice on authors' rights and copyright to encourage responsible and significant scholarship sharing. As subject liaison librarians, they support the creation, evaluation, dissemination, and long-term preservation of research, encourage the deposit of publications and data, and help instructors and students understand and interact with open access procedures. Ongoing professional development in scholarly publishing, open access, repositories, intellectual property, and faculty engagement is crucial as job demands in these areas rise. This will position these experts as primary forces behind increased accessibility and impact of academic research (Cohen, 2017).

TECHNOLOGY FACILITATOR AND DIGITAL SKILLS TRAINER: BRIDGING TECHNOLOGY AND ACCESS

Librarians are developing helpful resources (such as LibGuides) to support platforms like Moodle during significant migrations, working closely with IT and instructional design units, and designing and directing projects, such as an institutional iPad program. Librarians assist in lowering technology anxiety, attending to faculty needs, and making digital tools more accessible and useful for teaching and research by providing structured training, one-on-one consultations, and faculty learning communities. These efforts led to the formal integration of instructional design into the library, enhancing its standing as a hub connecting pedagogy, technology, and access for the academic community. Technology facilitators are responsible for determining both general and specialised digital competencies for various services, documenting best practices in manuals, and delivering instruction using a variety of pedagogical approaches (Stock-Kupperman, 2015). In software, resources, and platforms such as learning management systems, institutional repositories, and reference management tools, digital skills trainers focus on identifying training needs. Additionally, librarians help faculty members prepare digital materials for distribution. When libraries purchase new software, online resources, or learning modules, staff technology training is frequently required.

3. CONCLUSIONS

Current librarians bring users and intricate systems of information together and help sustain transparency, reproducibility and lifelong learning. By working collaboratively with faculties, IT units, researchers, and students, they foster the effective application of digital strategies, improve the practices of teaching and research, and champion the advocacy of the knowledge systems that are inclusive, and accessible. Hence, Library and Information Science (LIS) in the 21st Century recognises and positions librarians as major collaborators in advancing both the academy and society— leading partners in helping communities navigate constant change, as they preserve and protect access, equity and the right to think.

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