



DEMYSTIFYING AI FOR LIBRARIANS

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AGENDA

Challenges and Opportunities



Northwestern University in Qatar's Acting Library Director Iman M. Khamis examined chatbots and artificial intelligence technologies they plan in enhancing library recommendation engines. She presented her research at the 2023 International Federation of Library Associations and Institutions (IFLA) IT Section Mid-Term Conference.

In her presentation, Iman looked at ways to train AI systems for libraries as well as by using algorithms to improve the user experience for users.



Education



The Johns Hopkins University
Doctor of Education - EdD, Leadership
Sep 2023 - Sep 2027



Northwestern University
Master's degree, Data Science
Dec 2020 - Jun 2022

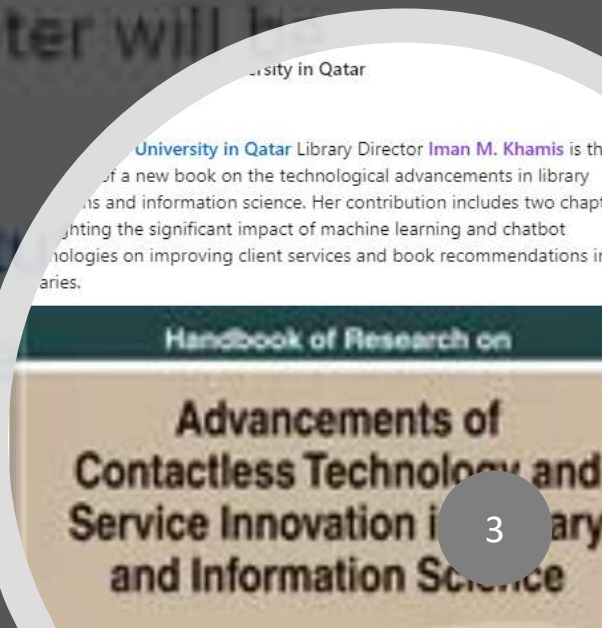


UCL
Master of Library & Information Science
2013 - 2014



Alexandria University
Bachelor of Education (B.Ed.), Biology
1999 - 2003

INTRODUCTION





HOW THE FUTURE MIGHT LOOK LIKE/ CHALLENGES

LET'S DIVE IN

TECHNICAL SERVICES

A survey was done in 2013, answered by 95 law firm librarians by @bibliobess

Just the Facts

- Only 7% of libraries have eliminated technical services functions
 - Primary tasks eliminated are check in and routing of print
- 49% of firm libraries outsource some functions
 - Primarily filing, mail and serials check in
- 23% of firms with multiple offices perform technical services functions outside of the main office
- 77% are cataloging electronic resources
- 47% are using the ILS to manage electronic resources (check in, routing)
- 55% of Technical Services staff handle current awareness such as RSS feeds
- 50% of technical services staff are responsible for some budget functions
- 29% are involved in contract negotiations
- 56% are responsible for reporting metrics

TECHNICAL SERVICES

Challenges

1. Automation of Cataloging: The introduction of integrated library systems in the late 20th century automated many aspects of technical services, including cataloging, acquisitions, and circulation. This replaced card catalogs with online public access catalogs (OPACs).

3. Metadata Management: There has been a shift from traditional cataloging to metadata management, which involves describing resources in a way that facilitates their discovery across various platforms.

2. Change of MARC Standards: The shift from the adoption of Machine-Readable Cataloging (MARC) for the digital cataloging process into RDA (Resource Description and Access) which is a more user-centered service.

4. Electronic Resources Management: Technical services now frequently manage a range of electronic resources, requiring new skills in negotiation, access troubleshooting, and usage data analysis.

TECHNICAL SERVICES

Challenges and opportunities cont..

5. Open Access and Institutional Repositories:

Libraries are increasingly involved in the open access movement, managing institutional repositories that provide free access to the scholarly output of their institutions.

7. Data Services: Libraries now often provide data services, including data curation and support for data-intensive research activities.

6. Preservation and Conservation: Digital preservation initiatives have become an important part of technical services, focusing on the long-term maintenance of digital materials.

8. Impact of AI and Machine Learning: The use of artificial intelligence and machine learning in technical services is an emerging trend, potentially revolutionizing how collections are organized and accessed.

2023 HIGHER EDUCATION TREND WATCH BY ASHLEY CARON AND NICOLE MUSCANELL

“This report focuses on the workforce, cultural, and technological shifts for ten macro trends emerging in higher education in 2023.”

Rank	Trend
1	Increasing need for data security and protection against threats to personal privacy
2	Continued adoption and normalization of hybrid and remote work arrangements
3 (tie)	Continued resignation and migration of leaders and staff from higher education institutions
3 (tie)	More calls for data informed decision making and reporting
5	Continuation and normalization of hybrid and online learning
6	Expansion of the digital transformation of higher education
7	Rising costs of higher education as public perceptions of its value are declining
8	Focus on increasing institutional resilience
9	Widespread efforts to understand and address discrimination and inequity
10	Need for improved data literacy and skills to keep up with growth in big data and analytics

Libraries and AI/Opportunities

AN OVERVIEW

AR / VR



AR in Medical Libraries



AR in Libraries

AR / VR



Grainger Engineering Library IDEA Lab

The Grainger Engineering Library IDEA Lab [Virtual Reality Lounge](#) includes a work space for groups utilizing Virtual Reality and Augmented Reality technologies, including:

- HTC Vive Pro w/Wireless Kit
- Oculus Go, Oculus Quest
- Oculus Rift ([loanable kits](#) available for check out at Grainger Circulation Desk)
- Valve Index
- Microsoft HoloLens
- VR workstations with software, including Unity, Unreal, Oculus Rift, Mixed Reality Portal, Steam

https://www.youtube.com/watch?v=N2ty_h5pZXs

SMART LIBRARIES

“Sensory” in Library Spaces at SMU Libraries

[/ All articles](#)

By: Nursyeha Yahaya, Devika Sangaram, Salihin M.A. & Aaron Tay, pp. 61-73

Abstract:

The Li Ka Shing Library recently included a new section, “Heat Maps” on the library website, providing users instant access to the physical occupancy spaces across all the different levels in the library. The indoor location-aware system is one in the latest slew of additions in tracking the library patrons’ visitations. It is the first of the many forms of library usage data sources that seek to provide an impetus in engaging the SMU community through real-time data visualizations. This enhances the perception of SMU Libraries as a creative nexus that nurtures and champions innovative methods of information access through technology innovations. This paper details the various forms of library usage data sources and how they impact the student patrons’ experience. It also outlines a case study on how data harnessed solutions can further foster a safe space that enriches and embodies the SMU Libraries experience.

<https://www.las.org.sg/wp/sjlim/sensory-in-library-spaces-at-smu-libraries/>

<https://www.youtube.com/watch?v=dQcLvWq89cY>

SMART LIBRARIES

Abstract

Automatically Cataloging Scholarly Articles using Library of Congress Subject Headings

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Institutes are required to catalog their articles with proper subject headings so that the users can easily retrieve relevant articles from the institutional repositories. However, due to the rate of proliferation of the number of articles in these repositories, it is becoming a challenge to manually catalog the newly added articles at the same pace. To address this challenge, we explore the feasibility of automatically annotating articles with Library of Congress Subject Headings (LCSH). We first use web scraping to extract keywords for a collection of articles from the Repository Analytics and Metrics Portal (RAMP). Then, we map these keywords to LCSH names for developing a gold-standard dataset. As a case study, using the subset of Biology-related LCSH concepts, we develop predictive models by formulating this task as a multi-label classification problem. Our experimental results demonstrate the viability of this approach for predicting LCSH for scholarly articles.

LC AI USE CASES

Active Artificial Intelligence Use Cases

Use cases for artificial intelligence at varying stages include:

- **Creating machine-readable text from digitized documents using Optical Character Recognition (OCR)** to support search and discovery of collections and content online.
- **Creating standardized catalog records from eBooks and other digital material**- testing different machine learning (ML) models to generate data for bibliographic records, measuring the quality of outcomes, and understanding the use of ML in the cataloging processing.
- **Extracting Historic Copyright Data** - experiment to test multiple machine learning (ML) models with a humans in the loop approach in hopes of producing machine-readable data from historic Copyright records.
- **Parsing legislative data** - experiment to to test machine learning (ML) models in creating geographic place and subject terms for legislative data with an emphasis on measuring the quality of outcomes and analyzing the use of ML in the larger legislative data workflow that supports analyst in delivering efficient and accurate services.
- The **National Library Service for the Blind and Print Disabled** is experimenting with available machine learning (ML) models to synthesize and compress lengthy book descriptions into succinct and engaging content for patron discovery.

Experiments to Date

- [Speech to Text Viewer](#): proof of concept tool testing off-the-shelf transcription tools
- [Exploring ML with the Project Aida team](#): six explorations of how machine learning could be applied to the Library's digital collections
- [Experimental Access](#): exploring experimental ways of providing access to the Library's digital collections
- [Humans in the Loop](#): an experimental humans in the loop workflow for pairing human decision-making with automated processes
- [Newspaper Navigator](#) by 2020 Innovator in Residence Ben Lee
- [Citizen DJ](#) by 2020 Innovator in Residence Brian Foo
- [America's Public Bible: Machine-Learning Detection of Biblical Quotations Across LOC Collections via Cloud Computing](#) by CCHC Research Expert Lincoln Mullen
- [Access & Discovery of Documentary Images](#) by CCHC Research Expert Lauren Tilton
- [Situating Ourselves in Cultural Heritage: Using Neural Nets to Expand the Reach of Metadata and See Cultural Data on Our Own Terms](#) by CCHC Research Expert Andromeda Yelton

LC AI USE CASES

2019 Innovator in Residence Program

Ben Lee's 2019 [Innovator in Residence project](#) will apply machine learning to extract visual content from the Library's digital collections. His goal is to make these images available to users in an interactive visualization such as on a timeline or a map or searching by topic.

Brian Foo, another [Innovator in Residence](#), has developed an algorithm capable of identifying segments in audiovisual content that appear to contain music. This automatic segmentation and labeling of videos has applications in enriching metadata, such as noting when an interviewee begins playing a song, and increasing access to these materials for users who are interested in knowing precisely where to look for certain song segments.

Other possible applications at the Library of Congress

Preservation

Machine learning may be used to assist with assessing collection management and preservation challenges. An initial project would investigate the use of image segmentation to automate the extraction of call numbers from photos of the stacks and, from that data, create a "heat map" visualizing the stacks most in need of intervention.

Rare Materials

Preliminary findings from the UNL project suggest that trained machine learning models are able to extract visual content from handwritten manuscript materials as well as typed documents.

ROBOTICS IN LIBRARIES

Applications of telepresence robots in libraries

Telepresence robots in libraries can be used in various applications, including:

Remote reference services: Telepresence robots allow librarians to provide reference services to remote users who cannot physically visit the library. Remote users can communicate with librarians in real time and receive assistance with research, database searching and other library-related enquiries.

Virtual programming: Telepresence robots can be used to provide virtual programmings, such as virtual storytimes, book clubs and other events. This allows libraries to reach a wider audience and engage with users who cannot attend in-person events.

Remote tours: Telepresence robots can be used to provide virtual tours of library spaces, collections and resources. This is particularly useful for users who cannot visit the library in person, such as distance learners or people with reliabilities.

Collaborative meetings: Telepresence robots allow remote users to participate in collaborative meetings and discussions with librarians and other users. This enhances collaboration and enables remote users to have an active role in library operations.

Accessibility: Telepresence robots can be used to enhance accessibility for users with disabilities, such as providing virtual sign language interpretation services or enabling remote users to access materials that are not available in their local library.



ROBOTICS IN LIBRARIES

Transforming Library Operation with Robotics

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Abstract:

At Singapore public libraries, robots and automatic sorting machines are used to help staff and volunteers with sorting returned books, shelf reading and transportation of library materials. The National Library Board (NLB) has embarked on its robotics journey in 2013 with the introduction of autosorter at the library@Chinatown. Since then, NLB has leveraged on technologies and robotics to re-engineer its library operations and automate many of the labour-intensive and time-consuming tasks.

The paper shares how the adoption of robotics and automation technologies has transformed the library operation and improved customer experience at the libraries. The initiatives include autosorters, shelf-reading robots and mobile bookdrop. These innovations have helped to achieve cost savings and simplified workflow for the aging workforce, in addition to bringing convenience to citizens. The operation staff can now take on other higher-value tasks such as engaging patrons and conducting library programmes.

Shelf reading. Delivery? Facilities?



NLB Singapore
Amazon trials humanoid robots to 'free up' staff
[-bit.ly/405kYkA-](http://bit.ly/405kYkA)



Food delivery @ CUG



Delivery, last mile



Floor cleaners @ CUG



Drone-based delivery



"At UPS's Advanced Technologies Group, four pillars of innovation – drones, autonomous vehicles, robotics, and sensor technology – are reinventing how deliveries are made and received."
[-bit.ly/2trf5gg-](http://bit.ly/2trf5gg)

ROBOTICS FUTURE

Building a brain: Meet Konikore the cyborg dog

How do you build a brain? The Konikore is a first-of-its-kind "smell cyborg", a smell processor that fuses brain cells and silicon to detect odours. Witness the Konikore's world debut in this live demo, as it sets its paws on the road to artificial general intelligence. Please note: This session will be taking place entirely in English. Listen along with live Arabic translations by using LiveVoice, accessible via the menu in the Web Summit Qatar mobile app.

DIGITAL SCHOLARSHIP

1- Johns Hopkins Coronavirus Resource Center by Benjamin Zaitchik

<https://coronavirus.jhu.edu/map.html>

2-Map of Old London

<https://mapoflondon.uvic.ca/agas.htm>

3- Archnet by MIT <https://www.archnet.org/>

Focuses on architecture, urbanism, environmental and landscape design, visual culture, and conservation issues related to the Muslim world.

4- Music 21 by MIT <https://web.mit.edu/music21/>

Music21 is a set of tools for helping scholars and other active listeners answer questions about music quickly and simply.

AI IN ACADEMIC LIBRARIES

Authors must declare use of artificial intelligence

Cambridge University Press, for example, recently updated its publishing ethics guidelines for journals to clarify its position on “authorship” as it pertains to AI. The guidelines read, in part:

- **AI use must be declared and clearly explained** in publications such as research papers, just as we expect scholars to do with other software, tools and methodologies.
- AI does not meet the Cambridge **requirements for authorship**, given the need for accountability. AI and LLM tools may not be listed as an author on any scholarly work published by Cambridge
- **Authors are accountable** for the accuracy, integrity and originality of their research papers, including for any use of AI.
- Any use of AI must not breach Cambridge’s **plagiarism policy**. Scholarly works must be the author’s own, and not present others’ ideas, data, words or other material without adequate citation and transparent referencing.

According to the ACRL,
"Although some could argue that public libraries would be better suited to introducing their users to artificial intelligence, academic libraries are in a unique position where they can combine their information literacy initiatives with AI literacy."

HOLOGRAM

HOLOGRAPHED HERITAGE



<https://ihc.ucsb.edu/holographed-heritage/>

SCHOLARLY COMMUNICATION IN LIBRARIES

1. Software like DSpace to create and manage institutional repositories where academic papers and theses are archived and made accessible.
2. Systems like CONTENTdm to manage digital collections <https://www.oclc.org/en/contentdm.html> & <https://www.youtube.com/watch?v=PSoZnhbB9ew>
3. Software such as Figshare offers platforms for storing, sharing, and citing research data. <https://www.youtube.com/watch?v=WlJlPmoJcJk>
4. Reference Management: Tools like Zotero and EndNote.
5. Platforms such as bepress's Digital Commons scholarly communication, including journal publishing, conference management, and showcasing faculty contributions <https://bepress.com/webinar/kick-starting-ir-success-stage/>
6. Current Research Information Systems (CRIS): PURE provides an overview of an institution's research output, facilitating reporting, analysis, and promotion of scholarly work <https://www.youtube.com/watch?v=s0k9VA7hyA4>

THANK YOU



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