Library & Information Science Research: Trends & Issues

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Outline

• Library development in recent decades
• Recent trends in libraries & issues
• Digital transformation in libraries
• Future trends in Library and Information science
• Impact of digital transformation on library and information science
Changing Trends in Libraries

1963-70: IBM Computers introduced in libraries

1970-75: Bibliographic Formats, Standards, and Data Exchange

1979-87: Networking and New Technologies - Micros, Optical Discs, CDROMs

1987-92: Networks, Protocols, Electronic Document Delivery, and OPACS


1998-2002: Digital libraries, Hybrid libraries

2003 – onwards: New technologies, open access, Knowledge management...

Source: IFLA
Past Decades Witnessed…

• Library automation, Digital library development
• E-journals & Databases aggregation
  - Abstracts to Full-text documents
• Integrating Web 2.0 services in libraries
• Document delivery services (offline to online platforms)
• Open access of resources & Creative Commons concept
• Service innovation in libraries
  - User centric services (SDI, discovery services, research literacy etc.)
• E-marketing of libraries & library services…
Changing Trends in Libraries…

• Modern librarians exhibit proficiency in finding information using digital and non-digital resources, but space-saving, e-resources, cost-effective electronic reading devices changing library spheres
• Technology use in libraries has increased
• SMART modern libraries need professionals
  – Who can use technology to quickly conduct research
  – Analyze data, develop new solutions
  – Tackle complex user problems
  – Train users, communities
Changing Trends in Libraries…(2)

• According to the American Library Association, libraries worldwide spend $1.8 billion on technology in 2018… empowering users
• Shift of Library vendors/Information providers from Libraries to Users
  – Use of Scopus/WoS for research measurement
  – Conducting Author workshops
  – Innovation in online searching
• The technology facilities offer users their first hands-on access to new products
Emerging Trends/Issues in LIS Research

• Website indexing
  – Automated indexing
  – Semantic web, XML/RDF
  – SEO services for information retrieval
• Use of clouds for information storage
• LIS marketing in digital space
• Application of Knowledge Management
• Digital transformation in libraries
  – Digital inclusion
  – Data driven services
Transformational Change…

Digitization
The process of making information available and accessible in a digital format.

Digitalization
The process of considering how best to apply digitized information to simplify specific operations.

Digital Transformation
The process of devising new business applications that integrate all the digitized data and digitalized applications.
Do You Know?…

- In the 15 years preceding 2025, technology experts predict that the total volume of digital information will expand from 130 to 40,000 exabytes.
- In the past two years, society has produced more data than the sum of all digital information created by humanity.
- By 2020, technology experts predict that society will generate 1.7 megabytes of information each second.
- By 2020, the sum of all digital information will grow from today’s 4.4 zettabytes to 44 zettabytes.
Cross the border ... see what is happening...outside the library block

Social media
Cloud
Bigdata
SEO
Web indexing
Crowd sourcing
Libraries to Contribute in Achieving Sustainable Development Goals

Role of data, Information and access playing a pragmatic role to address these goals
Do Libraries Need Digital Transformation?
What is Digital Transformation?

Digital transformation is a continuously changing process that represents a rapid fundamental change in how organizations should operate in a digital world. It modernizes an organization or community with digital technology at its core…

• A framework for rapid iterations
• To create powerful digital customer experiences
• Drives a cultural shift in an organization
• To provide continuous improvement in skill development
Why Digital Transformation?

- Internet use has increased up to 43% in India.
- **Under Digital India Mission, it has been estimated by Govt. that by 2030, digital economy’s share in India’s GDP will be 50%.**
- So there is a dire need to grow a digitally fluent workforce, with capabilities and competencies to use, understand, and adapt to digital technologies.
- All sectors and Libraries need to grow and develop accordingly.
What User Wants…

• Packaged services on their desktop…
• Resources and e-based services accessible using mobile…
• A space in library to explore and experience…
• A space for data driven connected learning…
• Skilled library staffs to provide on-time services…
Key To Digital Transformation...

DIGITAL INCLUSION
What Constitute DT

• **Work collaboratively** to solve problems and improve data driven services.

• **Taking collective responsibility** for a digital evolution by sharing digital skills and learning.

• The digital ecology is to foster **digital inclusion of people across the library domain** to lead digital initiatives.
  • Library staffs
  • Patrons
  • Community users
Debate and Discuss with Subject Domain Experts …

Collaborative service development
Digital Convergence at the Bottom of the Pyramid
Growth Path to Digital Inclusion

• Access to open knowledge
  – Open licensing, open data, and open access management
  – Data driven collaborative research
  – Promoting open educational resources and e-learning

• Strengthen digital literacy in communities
  – Creating a network of libraries to deliver digital literacy programmes
  – Bridging the digital divide at the ‘bottom of the pyramid’

• Empowering technologies
  – To use the appropriate digital technologies for services
  – To develop digital strategies using ICT future plan.
  – To develop ‘digital maker spaces’ for learning
Digital Inclusion of Users

- Designing & developing data driven services
  - Web-based databases & Analytics
  - Social Media driven
  - AI & VR application
- Incubation Hub in Libraries
  - Community participation
  - Users from SMEs, students
- Skill development of communities
  - Digital tool use
  - Privacy and online security
  - Maker spaces
The DML gives the Darien community access to high quality equipment for their digital projects. The room and equipment is reserved for special projects instead of general computing which is available in the Power Library. The lab was made possible thanks to the Friends of the Library and a reverse auction held at the 2012 spring’s Imagination Gala.

To make a reservation, please contact the Help Desk via email or call 203-699-5238. If you will need help in using the equipment, please ask for a one-on-one appointment as well.

All library cardholders may use the DML. Reserving the DML in advance and scheduling one-on-one appointments is limited to Darien residents, those who work in Town, and Friends of the Library. The Lab will be available for 2 to 4 hour reservable time slots. Members 14+ may use the Lab unassisted while anyone younger needs to be with an adult. Up to four people may be in the DML at one time. The person who makes the reservation needs to be present in the room.

Hardware

- Mac Pro
- VHS to DVD Converter
- Green Screen
- Camcorder
- Lighting Kit
- CD/DVD Replicator

Darien Library in Connecticut, USA
New Trend: Digital Inclusion…Makers space
Hudson Library in Ohio, USA
Makerspace

• Makerspaces can serve many valuable purposes including:
  – Facilitating prototype creation for entrepreneurs and inventors
  – Educating patrons on science and technology
  – Promoting creative problem solving
  – Offering experiential learning opportunities
EQUIPMENT

- 3D printers
- 3D scanners
- CNC machines
- Injection molders
- Laser cutters
- Plasma cutters
- Vacuum formers
- Wide format printers
- Vinyl cutters
New Trend: Gamification for Users

Gamification is an emerging trend that frames learning through a game format. Game mastery helps promote many skills, including math, logic, spatial reasoning, reading, and writing.

- Players may seek out the library for guides and handbooks.
- Video games encourage kids to read books like *The Ultimate Player’s Guide* & encouraged elementary age children.
- By supplying the right literature, libraries can promote literacy among players.
New Trend: Data Analytics

Huge digital data collection poses biggest challenges in analyzing the information to find meaningful conclusions

- Some opportunities in Library include:
  - Compiling and connecting data across research studies and reports
  - Providing easily searchable and understandable data to users
  - Developing and promoting educational content curated using data sources
  - Translating data into informational exhibits and programs
  - Dashboard & App based mobile libraries
<table>
<thead>
<tr>
<th>Information</th>
<th>Past</th>
<th>Present</th>
<th>Future</th>
</tr>
</thead>
<tbody>
<tr>
<td>What happened? (Reporting)</td>
<td>What is happening now? (Alerts)</td>
<td>What will happen? (Extrapolation)</td>
<td></td>
</tr>
<tr>
<td>How and why did it happen? (Modeling, Experimental Design)</td>
<td>What’s the next best action? (Recommendation)</td>
<td>What’s the best/worst that can happen? (Prediction, Optimization and Simulation)</td>
<td></td>
</tr>
</tbody>
</table>

Key Questions Addressed by Analytics ...
Welcome to CIHI’s Indicator Library

This library brings together metadata for health indicators in a convenient location on CIHI’s website. For each indicator, definitions, methodologies and characteristics such as reporting level are summarized in a standard template. Indicator results can also be accessed from hyperlinks provided in the library. The indicators in the library are organized according to CIHI’s Health System Performance Measurement Framework, but the tool also allows you to search for indicators by areas of need and reporting levels.

Showing all indicators

<table>
<thead>
<tr>
<th>Indicator</th>
<th>HSP Framework</th>
<th>Areas of Need</th>
<th>Reporting Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 Day Acute Myocardial Infarction In-Hospital Mortality</td>
<td>3.4 Appropriate and effective</td>
<td>B Getting better</td>
<td></td>
</tr>
<tr>
<td>30 Day Acute Myocardial Infarction Readmission</td>
<td>3.4 Appropriate and effective</td>
<td>B Getting better</td>
<td></td>
</tr>
<tr>
<td>30 Day All-Cause Readmission Rate After Isolated Coronary Artery Bypass Graft (CABG)</td>
<td>3.4 Appropriate and effective</td>
<td>B Getting better</td>
<td></td>
</tr>
</tbody>
</table>
People to People Connectivity…
New Trend: Social Media Use

Social media is an important space to connect with users. Library should put value to digital strategy as most of our users live in a digital world.

- By responding to social media tags, comments, or mentions, libraries gain a valuable opportunity to engage with their audience and strengthen social connections.
- Social media links make library events, activities, and offerings easily sharable to global masses...
- Promotion of digital contents
  - Historical photographs
  - Activities performed
  - Learning videos
  - VLoG etc.
New Trend: AI Application in Libraries

Supported with system driven, manual and sensor data, optimal resources use and measure value of libraries

• User services through resource recognition, satisfaction etc.
• Understanding library value and services through data before patrons, users,
  • System generated
  • Manually collected
  • CCTV based
• Use Library Dashboard to influence decisions making
  • Reporting to patrons about Library value
  • Data driven budget allocation
  • Support for Library purchase
  • User behaviour etc.
New Trend: Virtual Reality

Libraries may have the opportunity to offer users their first interactions with virtual reality...

– In California, Oculus launched an initiative that made 100 Oculus Rift headsets and VR-ready computers available in 90 libraries
– Users can experience museum collections or exotic travel destinations remotely
DT Impact on Libraries: Meaningful Architecture

- Reduced space for General collections
- Reduced space for collection processing
- Near-disappearance of reference collections
- More space for study and research: individual and groups
- More space for community: meetings, lectures, social gathering
- More white Boards/Smart Board/ LCD Projectors for group projects
- More space for technology peripherals for users
- Layouts that make library staff more accessible to users

Source: Grimm + Parker Architects
DT Impact on Libraries: Changing Investment Pattern

- Reduced print collections, purchase e-resources
- Spend more in technology upgradation
- Spend more on user equipments for maker-space
- Spend more time and money for adopting knowledge management
Impact of Digital Transformation in Library Space

- A new approach to curation and re-intermediation of information is urgently needed
- New labour markets drive interest in lifelong learning
- Libraries to act as powerful activators of public realm
- Library should embrace diversity and flexibility in infrastructure and data driven services
- Libraries to develop effective services through user’s participation
- Libraries need to be key assets for social resilience and economic prosperity

Source: ARUP, 2018
With the completion of this course, you will be able to understand that, how libraries have changed their services from print based to digital. Skillful modern library professionals and information scientists are needed for developing services and user empowerment.

Digital transformation is happening every field, so as in libraries. The course highlighted various aspects of digital transformation and pointed out that Digital Inclusion is of major importance for libraries. Libraries will function appropriately to achieve SDGs at global level.

Digital inclusion of users, local communities are of prime importance as these would bridge digital divide and enrich the under-previledged. In future success and value of libraries will be measured based on the extent of connectivity and training they have provided.
Summing Up

 ✓ Various new trends are coming-up and some of them are already been used in libraries such as AI, VR, Analytics etc. Modern librarians need to develop their own skillsets in order to remain valuable.

 ✓ In the future libraries will be viewed as a space where users will explore, imagine, debate and generate ideas. It will also be recognized as a space for lifelong learning. Libraries need to facilitate their quest for knowledge.
THANK YOU