Emerging Trends in Academic and Research Libraries

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Outline

- Background
- Digital Curation and Emerging Trends
- Open Access and Scholarly Communication
- Policy Frameworks and Stakeholders Roles
- Challenges and Opportunities
- Linkage of R&D and National Initiatives
- Summary
The Open Access movement is transforming scholarly communication.

While the notion of Open Access to scholarly information is not new, various factors, including local and national mandates for sharing the products of (funded) research drive scholars to rethink traditional scholarship models.

There's been some concerns, questions, and misconceptions about various issues, ranging from intellectual property and Copyrights to predator publications and quality issues.
Technology and Trends

Higher education institutions and academic libraries worldwide are undergoing transformation in the current digital and open environment.

A goal towards a global:

- Research communication Infrastructure
- Network of Interoperable digital archives
- Content network framework
- A federated system of national, regional, and global network of digital archives
Technological Infrastructure

- Submission system
- Crawling
- Indexing
- Preservation
- Archiving
- Harvesting
- Mirroring
- Search interfaces
Technological Infrastructure

• OAI–Compliant Solutions
• Web Services and API technologies
• URI
• FTP
• Servers, repository systems, high speed Internet
Open Access: Provision of unrestricted online access to results/outputs of research & development such as publications, reports, journal articles, and data, through self-archiving and open access publications.

Green Vs. Gold Open Access
- Gold OA: Publishing in journals for a fee
- Green: No fees to authors or funding agencies
Institutional Repositories

- Institutional Repository store, manage, provide access, facilitate use, re-use, and preservation

- Stages in IR development:
  - Interest in OA grows in early stages
  - Policy development
  - IR development

- IR Provisions
  - Pre/post prints, final versions
  - Articles, papers, books, chapters, reviews, presentations, reports, posters, patents, performances (audio/video)
  - Metrics, usage statistics, impact factors, creative license
Institutional Initiatives

● Facilitate depositing various output (in different formats) in the repository.

● Understanding basic copyrights:
  • Distribute, Reproduce, Create derivatives, Display, Perform your copyrighted works

● Encourage utilizing Creative Commons licenses

● Promote New Distribution Models
  • SPARC is an international alliance of academic and research libraries working to create a more open system of scholarly communication.
Creative Commons Licenses

- **Attribution**: CC BY
  - The most accommodating as long as they credit you
  - Recommended for maximum dissemination and use

- **Attribution-ShareAlike**: CC BY-SA
  - New creations under the identical terms

- **Attribution-NoDerivs**: CC BY-ND
  - Passed along unchanged and in whole

- **Attribution-NonCommercial**: CC BY-NC
  - Let others build upon your work non-commercially

- **Attribution-NonCommercial-ShareAlike**: CC BY-NC-SA
  - Attribution + NonCommercial + ShareAlike

- **Attribution-NonCommercial-NoDerivs**: CC BY-NC-ND
  - The most restrictive of our six main licenses.
Basic Assumptions about Open Access

Open Access leads to:

- Generation of more new ideas & discoveries
- Wider availability and accessibility of those ideas & discoveries
- Increased use of results of research & development
- Translation of research results (into practice)
- Improved education, economy, welfare, etc.
Open Access (OA) Policies

- Encourage the provision of open access
  - Voluntary
  - Mandatory

- Address the routes
  - Green
  - Gold
  - Hybrid

- Specify the type of repository
  - Central
  - Disciplinary
  - Institutional
# Stakeholders Roles and Levels of Influence

<table>
<thead>
<tr>
<th>Institutional</th>
<th>State</th>
<th>Country</th>
<th>Regional</th>
<th>International</th>
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<tr>
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<td>• Repositories</td>
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<td>• Funding &amp; budget support</td>
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<tr>
<td>• Declarations &amp; Statements</td>
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<tr>
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<td>• Encourage</td>
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Stakeholders Roles and Levels of Influence

- Institutional
  - Funding
  - Require
  - Infrastructure
  - Compliance
  - Repositories
- State
  - Funding & budget support
  - Require
  - Infrastructure
- Country
  - Funding & budget support
  - R&D Policies
  - Require
  - Compliance
  - Larger/Wider scale
  - Infrastructure
- Regional
  - R&D collaboration and consortium
  - Larger/Wider scale
  - Infrastructure
- International
  - Declarations & Statements
  - Support
  - Encourage
Policy Frameworks and Enforcement Mechanisms

- Not all policies are created equal

- Right policy and mandate encourage participation
  - Guidelines
  - Tools
  - Enforcement mechanisms

- Mandates and Policies by governments and funding agencies generally have a much wider coverage than institution-specific policies as they often introduce meaningful incentives and sanctions:
  - “...they are often more likely to create significant levels of change in author behavior” (Pinfield et al., 2014)
Compliance Rate of Investigators Funded by the NIH

- Voluntary (2004–2007): 5%
- Mandate (2008–2013): 80%

http://www.sparc.arl.org/resource/emerging-open-access-policy-framework-us
Digital Curation

• The selection, preservation, maintenance, and archiving of digital assets.

• Involves maintaining, preserving, adding value, and facilitate use and re-use throughout its lifecycle and over time.
Challenges of Digital Curation

- Rate of creation of new data and data sets
- Storage format evolution and obsolescence
- Maintaining accessibility to data through links and search results
- Comparability of semantic and ontological definitions of data sets
- Different community inclined to share items at different level of normalization
ARL’s Scenarios

Breaking the textbook monopoly

Bridging the scholar/practitioners divide

Everyone is a ‘non-traditional’ student
  – Cross the digital divide

I see what you see
  – Collaboration

Increasing threats of cyberwar and cybercrime
  – Cyberterrorism and digital preservation issues

Access from anywhere, anytime, via mobile devices
  – right here with me
Evolving Challenges

Challenges

- Versions
- Copyright
- Embargos
- Name Authority
- Author Rights
- Record Keeping
No single Approach or Model Addresses all Aspects of Digital Curation or Preservation Issues
The DCC Curation Lifecycle Model

Source: DCC: http://www.dcc.ac.uk/
In addition to the originally deposited PDF format, the data desiccation process provides and facilitates additional methods of access by:

- Exposing the page level OCR text to an increasing number of search engines
- Allowing page turning interfaces or other interfaces designed for emerging mobile devices
Visits from 200+ Countries

http://digital.library.unt.edu/explore/collections/UNTETD/browse/
6,000+ visits from Africa

437,719 visits came from 216 countries/territories

437,719 visits

Pages/Visit: 4.25
Avg. Time on Site: 00:02:33
% New Visits: 84.69%
Bounce Rate: 35.71%

This continent sent 6,007 visits via 5 subcontinent regions

Site Usage

Visits 6,007

Pages/Visit: 2.80
Avg. Time on Site: 00:02:49
% New Visits: 88.93%
Bounce Rate: 33.03%

Sub Continent Region | Visits | Pages/Visit | Avg. Time on Site | % New Visits | Bounce Rate
--- | --- | --- | --- | --- | ---
Northern Africa | 1,609 | 3.70 | 00:02:52 | 84.03% | 36.79%
Eastern Africa | 1,574 | 2.84 | 00:02:35 | 86.83% | 31.86%
Western Africa | 1,406 | 2.24 | 00:03:34 | 85.90% | 34.50%
Southern Africa | 1,356 | 2.53 | 00:02:19 | 93.51% | 28.30%
Middle Africa | 63 | 1.85 | 00:00:43 | 63.85% | 20.57%
These mobile devices sent 12,111 visits via 13 operating systems:

<table>
<thead>
<tr>
<th>Operating System</th>
<th>Visits</th>
<th>Pages/Visit</th>
<th>Avg. Time on Site</th>
<th>% New Visits</th>
<th>Bounce Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPhone</td>
<td>4,296</td>
<td>2.14</td>
<td>00:01:40</td>
<td>85.24%</td>
<td>42.33%</td>
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<tr>
<td>iPad</td>
<td>3,457</td>
<td>2.98</td>
<td>00:01:30</td>
<td>89.67%</td>
<td>36.99%</td>
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<tr>
<td>Android</td>
<td>2,737</td>
<td>1.99</td>
<td>00:01:38</td>
<td>89.99%</td>
<td>37.89%</td>
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<tr>
<td>iPod</td>
<td>835</td>
<td>1.89</td>
<td>00:01:03</td>
<td>90.66%</td>
<td>41.92%</td>
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<tr>
<td>BlackBerry</td>
<td>489</td>
<td>1.54</td>
<td>00:01:13</td>
<td>94.48%</td>
<td>50.31%</td>
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<tr>
<td>SymbianOS</td>
<td>105</td>
<td>1.80</td>
<td>00:05:15</td>
<td>100.00%</td>
<td>47.62%</td>
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<tr>
<td>Nokia</td>
<td>88</td>
<td>1.49</td>
<td>00:01:05</td>
<td>95.45%</td>
<td>80.68%</td>
</tr>
<tr>
<td>Windows</td>
<td>43</td>
<td>4.70</td>
<td>00:03:42</td>
<td>93.02%</td>
<td>48.84%</td>
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<tr>
<td>Samsung</td>
<td>38</td>
<td>1.61</td>
<td>00:00:30</td>
<td>97.37%</td>
<td>55.26%</td>
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<tr>
<td>Sony</td>
<td>11</td>
<td>1.27</td>
<td>00:00:11</td>
<td>90.91%</td>
<td>90.91%</td>
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<tr>
<td>LG</td>
<td>6</td>
<td>1.00</td>
<td>&gt; 00:00:00</td>
<td>83.33%</td>
<td>66.67%</td>
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<tr>
<td>Danger Hiptop</td>
<td>4</td>
<td>1.00</td>
<td>00:00:00</td>
<td>100.00%</td>
<td>100.00%</td>
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<tr>
<td>PalmOS</td>
<td>3</td>
<td>1.00</td>
<td>00:00:00</td>
<td>100.00%</td>
<td>100.00%</td>
</tr>
</tbody>
</table>
Traffic Sources Overview

All traffic sources sent a total of 437,719 visits

- 11.77% Direct Traffic
- 26.77% Referring Sites
- 61.46% Search Engines

Top Traffic Sources

<table>
<thead>
<tr>
<th>Sources</th>
<th>Visits</th>
<th>% visits</th>
</tr>
</thead>
<tbody>
<tr>
<td>google (organic)</td>
<td>240,051</td>
<td>54.84%</td>
</tr>
<tr>
<td>(direct) ((none))</td>
<td>51,533</td>
<td>11.77%</td>
</tr>
<tr>
<td>en.wikipedia.org (referral)</td>
<td>33,949</td>
<td>7.76%</td>
</tr>
<tr>
<td>yahoo (organic)</td>
<td>12,891</td>
<td>2.95%</td>
</tr>
<tr>
<td>stumbleupon.com (referral)</td>
<td>11,138</td>
<td>2.54%</td>
</tr>
</tbody>
</table>

Keywords

<table>
<thead>
<tr>
<th>Keywords</th>
<th>Visits</th>
<th>% visits</th>
</tr>
</thead>
<tbody>
<tr>
<td>crs reports</td>
<td>3,672</td>
<td>1.36%</td>
</tr>
<tr>
<td>congressional research service</td>
<td>1,323</td>
<td>0.49%</td>
</tr>
<tr>
<td>unt digital library</td>
<td>1,122</td>
<td>0.42%</td>
</tr>
<tr>
<td>congressional research service</td>
<td>680</td>
<td>0.25%</td>
</tr>
<tr>
<td>federal arbitration act</td>
<td>531</td>
<td>0.22%</td>
</tr>
</tbody>
</table>
Search Engines

UNT Digital Library

Search Engines

Sep 8, 2010 - Sep 8, 2011
Comparing to: Site

Search sent 269,022 total visits via 23 sources

Site Usage

<table>
<thead>
<tr>
<th>Visits</th>
<th>Pages/Visit</th>
<th>Avg. Time on Site</th>
<th>% New Visits</th>
<th>Bounce Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>269,022</td>
<td>3.45</td>
<td>00:01:57</td>
<td>88.34%</td>
<td>31.59%</td>
</tr>
<tr>
<td>% of Site Total: 61.46%</td>
<td>Site Avg: 4.25 (-18.82%)</td>
<td>Site Avg: 00:02:33 (-23.70%)</td>
<td>Site Avg: 84.75% (4.24%)</td>
<td>Site Avg: 35.71% (-11.53%)</td>
</tr>
</tbody>
</table>

Source | Visits | Visits | %
---|-------|-------|-------|
google | 240,051 | 89.23% |
yahoo | 12,891 | 4.79% |
bing | 9,982 | 3.71% |
search | 2,652 | 0.99% |
ask | 1,549 | 0.58% |
aol | 1,442 | 0.54% |
baidu | 176 | 0.07% |
daum | 107 | 0.04% |

89.23%
Committee Members Visualization
For open access to take off and flourish, especially in developing countries, institutions & governments need to:

- Invest in R&D and open access infrastructure
- Create or formulate open access mandates and policies
- Encourage all stakeholders to ensure compliance and policies implementations.
- Encourage a cultural change in academic & scientific communities (collaboration & sharing)
Challenges and Opportunities for Developing Countries

• To enhance the development of a global information society, increased attention has been given to the importance of addressing the digital divide.

• ICT enable economic growth and have strategic spillover effects on other sectors

• Similarly, OA empower people and help create greater access to information for all.

• In a world that links knowledge with economic growth, building an indigenous knowledge base and the ability to publish and disseminate local/national or regional research outputs critically important.
Linkage Between R&D and National Priorities

Long-Term Outlook for R&D Expenditures

Even if the historic stability of the U.S. and European commitment to research intensity (i.e., spending as a percent of GDP) continues, growth in China’s economy is likely to propel it to the top position in absolute R&D spending by the early 2020s.

Source: Battelle and R&D Magazine
Linkage Between R&D and National Priorities

Different Priorities Among Research Leaders

- U.S.: [Pie chart showing proportions of basic research, applied research, and development]
- China: [Pie chart showing proportions of basic research, applied research, and development]
- EU30: [Pie chart showing proportions of basic research, applied research, and development]

China places more emphasis on development, less on basic research.
Concluding Remarks

– Summary
– Collaborative Approach
The digital library environment provides scholars with access to more diverse and previously unavailable contents that span myriad technologies across institutions and nations.

Given the pressure of reading more in less time, today’s users, more than ever, demand access to various formats regardless of temporal and spatial restrictions and the types of devices used.

This poses challenges and presents opportunities to those who organize and provide access to digital resources.
Collaborative Approaches

- Considering the multiple stakeholders in the digital ecosystems, addressing the evolving scholarly communications and digital curation challenges require collaborative approaches.

  - In light of the rapid growth of Open Access and availability of scientific and educational resources, partnerships and multifaceted synergetic activities like CEARL enhance academic institutions’ ability to improve the creation, management, use, and exchange of scientific information in a manner that today’s users expect.
References


