FROM BASIC ILS TO
SOCially ENABLED
INFRASTRUCTURE:
Modernizing Library Automation

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Vanderbilt University Library
Founder and Publisher, Library Technology Guides
http://www.librarytechnology.org/
http://twitter.com/mbreeding

Sept 20, 2010
MnLINK User Group Meeting 2010
Marshall Breeding will share his view of the current state of the library technology industry, including recent developments in the realm of integrated library systems and discovery systems. The dynamics of the industry include a number of evolved systems facing a coming wave of automation platforms built anew with different conceptual foundations. Open source and proprietary products compete vigorously. Discovery has split away from the core automation systems as a new genre that offers library users a unified tool for interacting with library collections rather than the fractured approach of traditional library websites. Breeding will also highlight how social networks, mobile devices, and cloud computing are shaping the future direction of the technologies created or used in libraries.
Current state of the industry
The Library Technology Guides website aims to provide comprehensive and objective information related to the field of library automation. It provides information on the technology products, companies, and trends that impact libraries. Whether you are in the process of selecting a library automation system, or just want to keep up with developments in the field, Library Technology Guides is the place to start.

Guides

Perspective and commentary by Marshall Breeding

Lib-web-cats Advanced Search

I have made a minor adjustment to Library Technology Guides to limit the advanced search of lib-web-cats to those who register and login to the site. No costs apply to membership. I hope that this approach will lead to a higher level of user engagement on the site and make it more possible to deploy features in the future of specific interest to those with interest in library technology topics. The basic search page and the entries for the libraries, by far the most popular features of the site, will remain open to non-members. Please let me know if you have any questions or concerns regarding this new procedure.

Marshall Breeding, editor, Library Technology Guides

Marshall Breeding Jan 24, 2010 15:32:57 Link to this thread

Marshall, I certainly hope that you succeed in generating a higher level of user engagement.

I recently read Rose Holley’s PRoLA keynote “Crowdsourcing and Social Engagement: Potential, Power and Freedom for Libraries and Users”[1] which has some useful advice on user engagement. Perhaps having a dynamic list of recent additions/updates and of top user contributors could help open up what’s going on and encourage people to start, and then continue, engaging and contributing.

There are two things that bug me that would help the user experience (and so hopefully user engagement). One is that when you log in you aren’t taken back to the page you were on originally - sometimes the back button solves this, but sometimes it’s a bit of a hassle to renavigate to whatever page it was. The other is that it seems like you get signed out quite frequently. Whether it’s just a short session timeout, or conflicts with concurrent sessions (or both), it’s a little frustrating to have to sign in so often.


David Friggens Jan 24, 2010 18:45:47

Thanks for the feedback. I have increased the time-out value from two hours to six. It would definitely be nice for it to bring you back to the original page once you log in. I’ll see what I can do about implementing that feature.

Marshall Breeding Jan 25, 2010 08:28:08


I have posted the results of the 2009 annual survey of data collected from libraries rate their current integrated library systems, the company involved, and the quality of customer support. The survey also allows to gather data regarding attitudes regarding interest levels in open source ILS products. Perceptions 2009: An International Survey of library automation gives the general conclusions and presents all the statistical results derived from the survey. As usual, some of the most interesting and valuable information lies in the comments offered by responders.

Top survey findings

- Products and companies focusing on smaller libraries and narrower niches generally receive higher perception scores than those involved with larger, more complex organizations that and that serve multiple types of libraries.
## Dynamics of the ILS market

<table>
<thead>
<tr>
<th>Previous Integrated Library System</th>
<th>Replaced with new ILS</th>
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<tbody>
<tr>
<td><strong>Dynix</strong> (101)</td>
<td>ALEPH 500 (2) Destiny (1) Evergreen (1) Koha -- LibLime (41) Koha -- PTF S (1) Library Solution (5) Millennium (9) OPALS (0) OpenGalaxy (1) Polaris (4) Talis (1) Unicorn (34) Y-smart (1)</td>
</tr>
<tr>
<td><strong>Horizon</strong> (96)</td>
<td>AAgent VERSO (1) ALEPH 500 (2) Alexandria (1) Evergreen (6) Koha -- LibLime (9) Koha -- PTF S (1) Liberty3 (1) Library Solution (1) Millennium (6) OPALS (3) Polaris (25) Unicorn (38)</td>
</tr>
<tr>
<td><strong>Winnebago Spectrum</strong> (67)</td>
<td>AAgent VERSO (4) Alexandria (2) Apollo (9) Atrium (8) Destiny (3) Evergreen (10) Koha -- Independent (8) Koha -- LibLime (18) Library Solution (2) OPALS (2) Unicorn (1)</td>
</tr>
<tr>
<td><strong>Athena</strong> (49)</td>
<td>AAgent VERSO (2) Apollo (20) Atrium (3) Destiny (1) Evergreen (9) Koha -- Independent (2) Koha -- LibLime (2) Koha -- PTF S (1) Library Solution (2) OPALS (4) Polaris (2) Surpass (1)</td>
</tr>
<tr>
<td><strong>Unicorn</strong> (27)</td>
<td>Apollo (1) Evergreen (15) Koha -- LibLime (3) Koha -- PTF S (2) Millennium (2) Polaris (3) Spydus (1) Talis (1)</td>
</tr>
<tr>
<td><strong>Koha -- LibLime</strong> (26)</td>
<td>Apollo (1) Evergreen (4) Koha -- Independent (1) Koha -- LibLime -- PTF S (20)</td>
</tr>
<tr>
<td><strong>Voyager</strong> (11)</td>
<td>AAgent VERSO (1) Evergreen (1) Koha -- LibLime (7) Library Solution (1) Mandarin M3 (1)</td>
</tr>
<tr>
<td><strong>Library Solution</strong> (10)</td>
<td>Evergreen (8) Koha -- PTF S (1) Unicorn (1)</td>
</tr>
<tr>
<td><strong>Infocentre</strong> (10)</td>
<td>Apollo (2) Evergreen (5) Koha -- LibLime (2) Millennium (1) OPALS (0)</td>
</tr>
<tr>
<td><strong>Mandarin M3</strong> (6)</td>
<td>Evergreen (4) OPALS (1) Polaris (1)</td>
</tr>
<tr>
<td><strong>Concourse</strong> (6)</td>
<td>Atrium (2) Evergreen (3) Library Solution (1)</td>
</tr>
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<td><strong>Polaris</strong> (6)</td>
<td>AAgent VERSO (1) Evergreen (1) Polaris (1) Virtua (1)</td>
</tr>
<tr>
<td><strong>Millennium</strong> (5)</td>
<td>Atrium (1) Evergreen (1) Horizon (0) Koha -- Independent (0) Koha -- LibLime (1) Library World (0) Polaris (1)</td>
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<td><strong>CDS/ISIS</strong> (5)</td>
<td>ABCD (1) Koha -- Independent (2) Millennium (1) SIABUG (1)</td>
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<td><strong>Portfolio</strong> (4)</td>
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<td>Koha -- LibLime (1) OPALS (2)</td>
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<td><strong>PLUS</strong> (3)</td>
<td>Millennium (1) Unicorn (1) Y-smart (1)</td>
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<tr>
<td><strong>Locally developed</strong> (2)</td>
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<tr>
<td><strong>Vubis Smart</strong> (2)</td>
<td>Y-smart (2)</td>
</tr>
<tr>
<td><strong>OpenBiblio</strong> (2)</td>
<td>Koha -- Independent (1) Koha -- LibLime (1)</td>
</tr>
<tr>
<td><strong>Galaxy</strong> (2)</td>
<td>Evergreen (1) Polaris (1)</td>
</tr>
<tr>
<td><strong>PLM</strong> (2)</td>
<td>Koha -- Independent (2)</td>
</tr>
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</table>
**ILS Deployments in Minnesota – Academic**

### Academic Libraries in Minnesota

These graphs illustrate what automation systems are used by academic libraries. Illustrated on Information resources in the [lib-web-cats](http://lib-web-cats) database. Keep in mind that the lib-web-cats may not include all the libraries that use any given product.

#### Automation Systems Installed

Counting by library organizations. You can click on the product name to view lists of libraries that use them.

<table>
<thead>
<tr>
<th>System</th>
<th>Count</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td><strong>ALEPH 500</strong></td>
<td>24</td>
<td>90%</td>
</tr>
<tr>
<td>Horizon</td>
<td>1</td>
<td>4%</td>
</tr>
<tr>
<td>Koha − Libline</td>
<td>1</td>
<td>4%</td>
</tr>
<tr>
<td>LibrarySolution</td>
<td>1</td>
<td>4%</td>
</tr>
<tr>
<td>LibraryGraf</td>
<td>1</td>
<td>4%</td>
</tr>
<tr>
<td>Millenium</td>
<td>1</td>
<td>4%</td>
</tr>
<tr>
<td>Voyager</td>
<td>1</td>
<td>4%</td>
</tr>
</tbody>
</table>

Total number of libraries: 40

#### Automation Systems Installed

Counting all branches. This version of the graph counts the main facilities and all the associated branches represented in lib-web-cats.

<table>
<thead>
<tr>
<th>System</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ALEPH 500</strong></td>
<td>30</td>
<td>66%</td>
</tr>
<tr>
<td>Horizon</td>
<td>2</td>
<td>2%</td>
</tr>
<tr>
<td>Koha − Libline</td>
<td>2</td>
<td>2%</td>
</tr>
<tr>
<td>LibrarySolution</td>
<td>2</td>
<td>2%</td>
</tr>
<tr>
<td>LibraryGraf</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>Millenium</td>
<td>3</td>
<td>6%</td>
</tr>
<tr>
<td>Voyager</td>
<td>2</td>
<td>4%</td>
</tr>
</tbody>
</table>

Total number of library facilities: 47
ILS Deployments in Minnesota -- Public

Public Libraries in Minnesota
These graphs indicate what automation systems are used by Public libraries in based on information recorded in the lib-web-cats database. Keep in mind that lib-web-cats may not include all the libraries that use any given product.

Automation Systems Installed
Counting by Library organizations. You can click on the product names to view lists of libraries that use them.

<table>
<thead>
<tr>
<th>System</th>
<th>Count</th>
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<tr>
<td>Evergreen</td>
<td>1</td>
<td>1%</td>
</tr>
<tr>
<td>Horizon</td>
<td>81</td>
<td>100%</td>
</tr>
<tr>
<td>Millennium</td>
<td>6</td>
<td>4%</td>
</tr>
<tr>
<td>Polaris</td>
<td>1</td>
<td>1%</td>
</tr>
<tr>
<td>Unicorn</td>
<td>41</td>
<td>10%</td>
</tr>
<tr>
<td>Unknown</td>
<td>3</td>
<td>2%</td>
</tr>
<tr>
<td>Winnebago Spectrum</td>
<td>2</td>
<td>1%</td>
</tr>
</tbody>
</table>

Total number of libraries: 135

Automation Systems Installed
Counting all branches. This version of the graph counts the main facilities and all the associated branches represented in lib-web-cats.

<table>
<thead>
<tr>
<th>System</th>
<th>Count</th>
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<tr>
<td>Evergreen</td>
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<td>49%</td>
</tr>
<tr>
<td>Horizon</td>
<td>174</td>
<td>49%</td>
</tr>
<tr>
<td>Millennium</td>
<td>3</td>
<td>11%</td>
</tr>
<tr>
<td>Polaris</td>
<td>80</td>
<td>23%</td>
</tr>
<tr>
<td>Unicorn</td>
<td>88</td>
<td>22%</td>
</tr>
<tr>
<td>Unknown</td>
<td>3</td>
<td>11%</td>
</tr>
<tr>
<td>Winnebago Spectrum</td>
<td>2</td>
<td>11%</td>
</tr>
</tbody>
</table>

Total number of library facilities: 375
ILS market in Australia – Public

http://www.librarytechnology.org/lwc-ils-marketshare.pl?Country=Australia&Type=Public
# ILS market in Australia – Academic

<table>
<thead>
<tr>
<th>Library</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALEPH 500</td>
<td>15</td>
<td>17%</td>
</tr>
<tr>
<td>Advance</td>
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<td>1%</td>
</tr>
<tr>
<td>Amlib</td>
<td>1</td>
<td>1%</td>
</tr>
<tr>
<td>Horizon</td>
<td>8</td>
<td>9%</td>
</tr>
<tr>
<td>Koha -- Independent</td>
<td>1</td>
<td>1%</td>
</tr>
<tr>
<td>Liberty3</td>
<td>1</td>
<td>1%</td>
</tr>
<tr>
<td>Millennium</td>
<td>19</td>
<td>22%</td>
</tr>
<tr>
<td>Unicorn</td>
<td>12</td>
<td>14%</td>
</tr>
<tr>
<td>Unknown</td>
<td>2</td>
<td>2%</td>
</tr>
<tr>
<td>Virtua</td>
<td>5</td>
<td>6%</td>
</tr>
<tr>
<td>Voyager</td>
<td>21</td>
<td>24%</td>
</tr>
</tbody>
</table>

Total number of libraries: 86

Perceptions 2009

- Third annual survey
- Survey results were gathered
  November 4, 2009 -- January 11, 2010
- 2,098 responses
- Published only through Library Technology Guides

http://www.librarytechnology.org/perceptions2009.pl
How satisfied is the library with your current *Integrated Library System (ILS)*?

<table>
<thead>
<tr>
<th>Satisfaction Score for ILS</th>
<th>Response Distribution</th>
<th>Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company</td>
<td>Responses 0 1 2 3 4 5 6 7 8 9</td>
<td>Mode Mean Median Std Dev</td>
</tr>
<tr>
<td>Apollo</td>
<td>35 6 10 19</td>
<td>9 8.37 9 1.35</td>
</tr>
<tr>
<td>AAgent VERSO</td>
<td>71 1 1 5 16 27 21</td>
<td>8 7.83 8 0.95</td>
</tr>
<tr>
<td>Polaris</td>
<td>92 1 1 2 1 1 13 52 21</td>
<td>8 7.79 8 0.83</td>
</tr>
<tr>
<td>Koha -- Independent</td>
<td>26 4 5 10 7</td>
<td>8 7.77 8 1.57</td>
</tr>
<tr>
<td>OPALS</td>
<td>41 1 1 1 1 12 7 18</td>
<td>9 7.66 8 1.41</td>
</tr>
<tr>
<td>Atrium</td>
<td>55 4 13 14 19</td>
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<td>Millennium</td>
<td>343 7 10 31 32 109 102 51</td>
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<tr>
<td>Library Solution</td>
<td>110 1 2 4 3 6 4 45 26 19</td>
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</tr>
<tr>
<td>Evergreen</td>
<td>19 1 10 5 21 6 6</td>
<td>7 6.76 7 1.00</td>
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<tr>
<td>Circulation Plus</td>
<td>38 2 2 1 2 2 1 3 7 9 9</td>
<td>8 6.39 7 1.30</td>
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<tr>
<td>Spydus</td>
<td>22 1 1 1 1 4 7 6 1</td>
<td>7 6.36 7 1.28</td>
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<tr>
<td>ALEPH 500</td>
<td>133 2 1 1 7 7 16 27 37 31 4</td>
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<td>Virtua</td>
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<td>Koha -- LibLime</td>
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<td>Horizon</td>
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<tr>
<td>Symphony (Unicorn)</td>
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</tr>
<tr>
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<td>164 0 10 2 31 32 21 4 22 4</td>
<td>7 5.91 6 0.23</td>
</tr>
<tr>
<td>Athena</td>
<td>21 1 3 2 1 1 4 4 1 2 3</td>
<td>6 5.57 6 0.65</td>
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<tr>
<td>Winnebago Spectrum</td>
<td>33 3 1 3 1 5 6 3 5 5 1</td>
<td>5 4.91 5 1.22</td>
</tr>
<tr>
<td><strong>All Responses</strong></td>
<td><strong>2041 22 25 46 61 88 222 266 594 466 251</strong></td>
<td><strong>7 6.62 7 0.20</strong></td>
</tr>
</tbody>
</table>
How likely is it that this library would consider implementing an open source ILS?

<table>
<thead>
<tr>
<th>Interest Level in Open Source</th>
<th>Response Distribution</th>
<th>Statistics</th>
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</thead>
<tbody>
<tr>
<td>Company</td>
<td>Responses</td>
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<tr>
<td>Koha -- Independent</td>
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<td>19</td>
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<tr>
<td>Evergreen</td>
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<tr>
<td>Koha -- LibLime</td>
<td>46</td>
<td>39</td>
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<tr>
<td>OPALS</td>
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<td>23</td>
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<tr>
<td>Winnehago Spectrum</td>
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<td>23</td>
</tr>
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<tr>
<td>Voyager</td>
<td>164</td>
<td>21</td>
</tr>
<tr>
<td>Symphony (Unicorn)</td>
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<td>24</td>
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<td>Virtua</td>
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<td>16</td>
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<td>Millennium</td>
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<td>3</td>
</tr>
<tr>
<td>All Responses</td>
<td>1995</td>
<td>1</td>
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</tbody>
</table>
Perceptions 2009 -- observations

- Products and companies focusing on smaller libraries and narrower niches generally receive higher perception scores.
- Companies supporting proprietary ILS products receive generally higher satisfaction scores than companies involved with open source ILS.
- Except for the libraries already using an open source ILS, the survey reflected low levels of interest, even when the company rates their satisfaction with their current proprietary ILS and its company as poor.
Library Journal Automation Marketplace

- Published annually in April 1 issue
- Based on data provided by each vendor
- Focused primarily on North America
  - Context of global library automation market
LJ Automation Marketplace

Annual Industry report published in *Library Journal*:

- 2010: New Models, Core Systems
- 2009: Investing in the Future
- 2008: Opportunity out of turmoil
- 2007: An industry redefined
- 2006: Reshuffling the deck
- 2005: Gradual evolution
- 2004: Migration down, innovation up
- 2003: The competition heats up
- 2002: Capturing the migrating customer
## ILS Sales Statistics: total

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<th>2007</th>
<th>2008</th>
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<td>6</td>
<td>23</td>
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<td>47</td>
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<td>18</td>
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<tr>
<td>Evergreen</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6</td>
<td></td>
<td>18</td>
<td></td>
<td></td>
</tr>
<tr>
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<td>22</td>
<td>34</td>
<td>12</td>
<td>4</td>
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<td></td>
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</tr>
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<td>27</td>
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</tbody>
</table>
New Models…

...no longer an industry where companies compete on the basis of the best or the most features in similar products but one where companies distinguish themselves through products and services that define different futures for their library customers.
Core Systems…

Although ILS sales no longer completely define the library automation market, new sales and ongoing support of these flagship products continue as the largest and most reliable revenue stream.
General Findings

- Moderately slow year for Core ILS products
- Strong sales in Discovery Products
  - Strategy to move forward with new user interfaces and defer investments in ILS replacement
  - Current products deliver modern interfaces, while mainly addressing local content (ILS / local digital)
  - Emerging products bring vast collections of articles into the primary discovery layer: Web-scale discovery
Business Transitions

- Polaris Library Systems
  - Management buy-out

- LibLime
  - Acquisition by competitor PTFS
  - Consolidation in fragmented market niche
Key Context: Libraries in Transition

- Shift from Print > Electronic
- Increasing emphasis on subscribed content, especially articles and databases
- Strong emphasis on digitizing local collections
- Demands for enterprise integration and interoperability
Key Context: Library Users in Transition

- New generations of library users:
  - Millennial generation
    - Self sufficient – reluctant to seek assistance
    - Perceive themselves as competent to use information tools without help
  - Web savvy / Digital natives
  - Pervasive Web 2.0 concepts /
  - Inherently collaborative work styles
Key Context: Technologies in transition

- XML / Web services / Service-oriented Architecture
- Beyond Web 2.0
  - Integration of social computing into core infrastructure
- Local computing shifting to cloud platforms
  - SaaS / private cloud / public cloud
- Full spectrum of devices
  - full-scale / net book / tablet / mobile
  - Mobile the current focus, but is only one example of device and interface cycles
Dynamics of the Library Automation Scene

- Evolutionary ILS
- Revolutionary ILS
- Open source and Licensed alternatives

http://www.uoquelp.ca/theportico/science/people/
Evolutionary path

- Gradual enhancement of long-standing ILS platforms
- Wrap legacy code in APIs and Web services
- SirsiDynix
  - Unicorn (+Horizon functionality) > Symphony
- Innovative
  - INNOVAQ > INNOPAC > Millennium > Encore
- Civica
  - Urca > Spydus
    (Urca Integrated Systems, Amalgamated Wireless Australia, McDonnell Douglas Information Systems, Sanderson)
Evolution vs. Revolution

- The library automation market has a long-standing preference of evolved systems.
- Very difficult and lengthy process to build a new library automation system from scratch.
- Ramp-up period for a new system is 2-5 years.
- Legacy systems bring forward both rich functionality as well as concepts tied to the past.
Revolutionary Path

- Ex Libris URM
- Kuali OLE
- OCLC Web-scale Management Service
Competing Models of Library Automation

- Traditional Proprietary Commercial ILS
  - Millennium, Symphony, Polaris
- Traditional Open Source ILS
  - Evergreen, Koha
- Clean slate automation framework (SOA, enterprise-ready)
  - Ex Libris URM, OLE Project
- Cloud-based automation system
  - WorldCat Local (+circ, acq, license management)
Rethinking library automation

- Fundamental assumption: Print + Digital = Hybrid libraries
- Traditional ILS model not adequate for hybrid libraries
- Libraries currently moving toward surrounding core ILS with additional modules to handle electronic content
- New discovery layer interfaces replacing or supplementing ILS OPACS
- Working toward a new model of library automation
  - Monolithic legacy architectures replaced by fabric of SOA applications
  - Comprehensive Resource Management

Ex Libris URM

- “integrates back-office processes across all library materials, regardless of type, format, and acquisition method”
- “reduces effort and lowers costs associated with metadata management”
- “a flexible environment for libraries to join forces …”
- “service-oriented architecture and fully-documented Web services”
Kuali OLE

- http://kuali.org/ole
- Mellon funded project to create new enterprise level automation platform for research libraries
- 1-year planning project led by Duke University
- Manage resources of all formats
- More than an ILS / Less than an ILS
- Community Source / Open Source
OLE Project: Phase I

- Planning and Design Phase
- Develop Vision + Blueprint
- Work with consultants with expertise in SOA and BPM
- Instill community ownership of OLE
- Recruit partners for Phase II
OLE Project: Phase II

- 2-year build project led by Indiana University
- $2.38 million from Mellon matched by capital and in-kind contributions by development partners
- Community source reference implementation
- Create software based on OLE blueprint from current project
- Early software in 18-24 months
- High level of investment and commitment to implementation
OCLC Web-scale Management Service

- "the first Web-scale, cooperative library management service"
- New highly scaleable platform for WorldCat
  - Cataloging
  - Interlibrary loan
  - Discovery (WorldCat Local)
  - Circulation
  - Acquisitions
  - License Management
- Early deployments underway now – UTC, Pepperdine, etc

In Challenge to ILS Industry, OCLC Extends WorldCat Local To Launch New Library System
http://www.libraryjournal.com/article/CA6653619.html
Open Source Library Automation

- Koha
- Evergreen
- Kuali OLE
Open Source Companies

- US: LibLime, Equinox, MediaFlex
- Australia/NZ: Katipo, CALYX information essentials, Strategic Data, Catalyst
- Building support
  - Concept of open source
  - Promotion of specific products
- Struggling to meet expectations
  - Satisfaction lower than many companies offering proprietary products
  - Some companies offering proprietary products score much lower than open source
What does it mean to be Open?
<table>
<thead>
<tr>
<th>Is Open Source ILS transformative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open source version of legacy models?</td>
</tr>
<tr>
<td>Or</td>
</tr>
<tr>
<td>New opportunities to support modern libraries?</td>
</tr>
</tbody>
</table>
This report aims to assess the current slate of major library automation systems in regard to their ability to provide openness through APIs, Web services, and the adoption of SOA.
“We also note that the two open source systems lag behind proprietary systems in terms of customer-facing APIs that result in tangible activities which extend functionality or enable interoperability.”
Opening up Library Systems through Web Services and SOA: Hype or Reality?

“The APIs available to library programmers continue to be quirky and less than comprehensive, even from the vendors with the strongest offerings in this area.”
Closed Systems

End User Interfaces:

Functional modules:

Data Stores:

Staff Interfaces:

Programmer access:

No programmable Access to the system.

Captive to the user Interfaces supplied by the developer
Open Source Model

End User Interfaces:

Functional modules:

Data Stores:

Staff Interfaces:

Programmer access:

All aspects of the system available to inspection and modification.

Cataloging  Circulation  Acquisitions
Open API Model

End User Interfaces:

Functional modules:

Data Stores:

Staff Interfaces:

Programmer access:

Core application closed.

Third party developers code against the published APIs or RDBMS tables.
Open Source / Open API Model

End User Interfaces:

Functional modules:

Data Stores:

Staff Interfaces:

Programmer access:

Core application closed.

Third party developers code against the published APIs or RDBMS tables.
Application based on Internal Proprietary programming

Delivered Interfaces

Core Software

Core Functionality / Business Logic

Data stores

Public Interface

Staff Interface

Reports Module
Application API exposed to External Applications

Delivered Interfaces use proprietary programming

Core Software

Data stores

RDMS API

Core Functionality / Business Logic

Application Programming Interfaces

External applications
New models of Library Collection

Discovery

From local discovery to Web-scale discovery
Crowded Landscape of Information Providers on the Web

- Lots of non-library Web destinations deliver content to library patrons
  - Google Search / Google Scholar
  - Amazon.com
  - Wikipedia
  - Ask.com
Evolution of library collection discovery tools

- Bound handwritten catalogs
- Card Catalogs
- Library online catalogs – OPACs
- Discovery interfaces
- Web-scale discovery services
Moving beyond this...
Get a first look at *Beedle the Bard*, J.K. Rowling's handcrafted book of fairy tales

1. **Harry Potter and the Deathly Hallows (Book 7)** by J.K. Rowling and Mary GrandPré (Hardcover - Jul 21, 2007)
   - **Buy new:** $34.99 **$20.99** 468 Used & new from $5.25
   - Get it by Tuesday, April 8 if you order in the next 5 hours and choose one-day shipping.
   - Eligible for **FREE** Super Saver Shipping.
   - **🌟🌟🌟🌟🌟 (3,083)**
   - **Books:** See all 9,550 items

2. **Harry Potter and the Order of the Phoenix (Two-Disc Special Edition)** by Timothy Burton, Helena Bonham Carter, Robbie Coltrane, and Warwick Davis (DVD - Dec 11, 2007)
   - **Buy new:** $34.99 **$12.99** 79 Used & new from $10.70
   - Get it by Tuesday, April 8 if you order in the next 5 hours and choose one-day shipping.
   - Eligible for **FREE** Super Saver Shipping.
   - **🌟🌟🌟🌟🌟 ($90)**
   - Also available for download from Amazon Unbox
   - **DVD:** See all 137 items

3. **Harry Potter and the Order of the Phoenix (Widescreen Edition)** by Daniel Radcliffe, Emma Watson (II), Rupert Grint, and Harry Melling (DVD - Dec 11, 2007)
   - **Buy new:** $28.98 **$15.99** 106 Used & new from $8.49
   - Get it by Tuesday, April 8 if you order in the next 5 hours and choose one-day shipping.
   - Eligible for **FREE** Super Saver Shipping.
   - **🌟🌟🌟🌟🌟 ($90)**
   - Also available for download from Amazon Unbox
   - **DVD:** See all 137 items

   - **Buy new:** $59.94 **$35.87** 35 Used & new from $28.95
   - Get it by Tuesday, April 8 if you order in the next 4 hours and choose one-day shipping.
   - Eligible for **FREE** Super Saver Shipping.
   - **🌟🌟🌟🌟🌟 (236)**
   - **Books:** See all 9,558 items
Disjointed approach to information and service delivery

- Silos Prevail
  - Books: Library OPAC (ILS module)
  - Articles: Aggregated content products, e-journal collections
  - OpenURL linking services
  - E-journal finding aids (Often managed by link resolver)
  - Subject guides (e.g. Springshare LibGuides)
  - Local digital collections
    - ETDs, photos, rich media collections
  - Metasearch engines

- All searched separately
Lack of unified Web presence

- User’s don’t understand the distinctions we make
  - Web site content
  - Search interfaces based on content formats
  - Non-library Web sites are much more unified
A simple vision

- A single point of entry to all the content and services offered by the library

- ...but with precision, nuanced sophistication, and multiple dimensions
Modernized Interface

- Single search box
- Query tools
  - Did you mean
  - Type-ahead
- Relevance ranked results
- Faceted navigation
- Enhanced visual displays
  - Cover art
  - Summaries, reviews,
- Recommendation services
Discovery Products

http://www.librarytechnology.org/discovery.pl
### Decoupled from ILS

<table>
<thead>
<tr>
<th>Discovery Product</th>
<th>Integrated Library Systems</th>
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<tbody>
<tr>
<td>AquaBrowser Library:</td>
<td><strong>ALEPH 500</strong> (4) <strong>Alexandria</strong> (1) <strong>Amicus - Italy</strong> (2) <strong>BIBDIA</strong> (1) <strong>BICAT</strong> (17) <strong>Bibliotheca2000</strong> (1) <strong>Carl</strong> (27) <strong>Carl.X</strong> (6) <strong>Circulation Plus</strong> (1) <strong>Concerto</strong> (2) <strong>DB/TextWorks</strong> (1) <strong>Evergreen</strong> (1) <strong>Heritage</strong> (1) <strong>Horizon</strong> (137) <strong>Koha -- LibLime</strong> (2) <strong>Koha -- PTFS</strong> (1) <strong>Library.Solution</strong> (50) <strong>Locally developed</strong> (1) <strong>Millennium</strong> (79) <strong>Polaris</strong> (11) <strong>Sunrise</strong> (1) <strong>Talis</strong> (2) <strong>Unicorn</strong> (59) <strong>Virtua</strong> (3) <strong>Voyager</strong> (41) <strong>Vubis Smart</strong> (17)</td>
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<td><strong>Infocentre</strong> (1) <strong>Millennium</strong> (2)</td>
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</tr>
</tbody>
</table>
Social discovery

- Tags, user-supplied ratings and reviews
- Leverage social networking interactions to assist readers in identifying interesting materials: BiblioCommons
- Leverage use data for a recommendation service of scholarly content based on link resolver data: Ex Libris bX service
- Move beyond Web 2.0 mindset of social computing as an add-on to an infrastructure inherently based on collaborative computing models.
Deep indexing

- Metadata can no longer serve as the only basis for discovery
- Increasing opportunities to search the full contents
  - Google Library Print, Google Publisher, Open Content Alliance, government publications, etc.
  - High-quality metadata will improve search precision
- Commercial search providers already offer “search inside the book” and searching across the full text of large book collections
- Important transition to full-text book search beginning in library projects
  - HathiTrust indexing 6 million volumes
  - Must become a routine component of library discovery
- Deep search highly improved by high-quality metadata
Discovery product Trend

- Initial products focused on technology
  - AquaBrowser, Endeca, Primo, Encore, VUfind
  - Mostly locally-installed software

- Current phase focused on pre-populated indexes that aim to deliver Web-scale discovery
  - Summon (Serials Solutions)
  - WorldCat Local (OCLC)
  - EBSCO Discovery Service (EBSCO)
  - Primo Central
  - Encore with Article Integration
Discovery Interface

Search: [ ]

Local Index

MetaSearch Engine

ILS Data
Digital Collections
ProQuest
EBSCOhost
MLA Bibliography
ABC-CLIO

Search Results

Real-time query and responses
Web-scale Search

Search:

Consolidated Index

Pre-built harvesting and indexing

ILS Data
Digital Collections
ProQuest
EBSCOhost
MLA Bibliography
ABC-CLIO
Web-scale Search + Federated Search

Search:

Digital Collections
ProQuest
MLA Bibliography
ABC-CLIO

Pre-built harvesting and indexing

Non-harvestable Resources

Consolidated Index

Search Results

Fed Search

Interim model to deal with resources not possible to harvest into consolidated index
Pre-populated discovery services

- New-generation interface
- Harvested local content
  - ILS metadata
  - Institutional repositories, ETDs, Digital Collection platforms
- Vendor-supplied indexes of library content
  - E-journals, databases, e-books
    - Full-text and metadata corresponding to e-content subscriptions
  - Book collections beyond local library collections
Other Key Library Tech Trends
Mobile

- Increased adoption of mobile devices
- Gartner (reported by cnet:)
  - By 2013, mobile phones could easily surpass PCs as the way most people hop onto the Web. Gartner's statistics show that the total number of PCs will reach 1.78 billion in three years, while the number of smartphones and Web-enabled phones will shoot past 1.82 billion units and continue to climb after that. This trend will force more Web sites to revamp their pages to make them easier to surf on a mobile gadget.

Mobile phones getting smarter

- Not just for calls
- SMS Messaging
- Web access
- Specialized apps
- Built-in GPS
- Camera
Tablet computing

- Tablet computers have been around for a while, but the introduction of Apple’s iPad increases popularity.
- High-quality device for content consumption.
- Impact on e-books?

Mobile devices displacing laptops?

- Initial headline
  - “Mr. Dunn [Best Buy Chief Executive Brian Dunn] also said internal estimates showed that the iPad had cannibalized sales from laptop PCs, especially netbooks, by as much as 50%.”

- Some backtracking, but clear that new devices are changing the landscape.
Mobile access to library content and services

- New opportunity to retain and attract library users
- Mobile web and apps
- Working toward a unified Mobile library presence
- Unify disjointed mobile silos the same ambitions as we have for our the Web
Sampling of mobile products

- North Carolina State University
  - Early work in mobile web development
- Innovative: AirPAC
- SirsiDynix – BookMyne
- Polaris Mobile PAC
- Summon Mobile app
- LibraryAnywhere from LibraryThing
- Apps for many content products
- EBSCOhost Mobile
Do Libraries need to rethink their wholesale prohibitions toward mobile devices and offer more mobile-friendly attitudes?

http://www.flickr.com/photos/travelinlibrarian/1924719853/
E-Books and Readers

- E-books reaching critical thresholds
- Amazon e-books sales outpace hardcover books
- (but not more than paperbacks)
- Concern for library model for e-book lending

RFID-based Technologies

- Self-check
  - Beyond simple check-out to more sophisticated services at self-service stations
- Anti-theft security
- Automated sorting on return
- Inventory
- Evolving standards and best practices
RFID in action
Social Networks

- Most libraries today have a Facebook page or a Twitter feed
  - Mixed results on impact for library outreach
- Some marginal benefits to providing access to library services through popular social network sites
- Proving ground for how to build library applications that are attractive to library clientele
- Make social features part of the library’s basic technical infrastructure
Digitization

Kirtas Book Scanning system
(This model on display in Singapore)
As libraries shift to more digital books, many library patrons will need the capacity to print copies for reading.

Espresso print on demand station at the University of Melbourne
Gaming as a library service
High-capacity Storage
Continuum of Abstraction

- Locally owned and installed servers
- Co-located servers
- Co-located virtual servers
- Web hosting
- Server hosting services
- Application Service Provider
- Software-as-a-service
- Platform-as-a-service
Cloud computing – basic understanding

- Any arrangement where the library relies on some kind of remote hosting environment for major automation components

- Includes:
  - Almost any vendor-hosted offering
Cloud computing – formal definitions

- Highly abstracted computing model
- Utility model
- Provisioned on demand
- Scaled according to variable needs
- Discrete virtual machines
- Compute cycles on demand
- Storage on demand
- Elastic – consumption of resources can contract and expand according to demand
Hosting Services

- Web hosting
  - Web site only
  - Standard support for PHP, Perl, and other dynamic page generation

- Dedicated Server
  - Appropriate for applications that have not been tested and deployed in virtual environments

- Virtual server
  - Requires software that supports virtualization
Advantages

- Increasing opportunities to eliminate local servers and tech support
- Most libraries cannot support the cost of systems and network administrators which command higher salaries than professional librarians
- Eliminate hardware replacement, operating systems upgrades, etc.
Software-as-a-Service

- Complete software application, customized for customer use
- Eg: Salesforce.com
Platform-as-a-Platform as a Service

- Virtualized computing environment for deployment of software
- Amazon Elastic Compute Cloud (EC2)
Storage-as-a-Service

- Provisioned, on-demand storage
- Bundled to, or separate from other cloud services
Private vs Public cloud

- Public – multi-tenant provisioning
  - Logically isolated computing environment
  - Theoretical security / competitive concerns
- Private – cloud architecture, institutionally owned/controlled
  - Leverages cost and scalability
  - Enforces physical segregation
Questions and discussion
Thanks!