Unraveling the (search) string
Assessing library discovery layers using patron queries

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Library Assessment Conference 2020–2021
Location: Logan, Utah
FTE: 22,072 (fall 2020)
Budget: $12 million, $6 million materials
ILS+discovery tool: Sierra+Encore Duet
Research questions

What are users’ general strategies? (What are they doing?)
How effective are users’ searches? (Is it working?)
Methods

Data scraped: from Encore Duet, 3,604 URLs visited and the corresponding 68,022 search results

Dates collected: 3 days in Fall 2019

Tools used: Google Analytics, Airtable, Octoparse

Coding objectives: URL content, search queries, known items
General observations: Type of search

Findings

Number of Sessions by Type of Search

- **Known Item**: 570
  - kenneth heineman campus wars
  - mozart piano sonata no 18 in d major

- **Topical**: 395
  - traffic analysis logan utah
  - nouns
  - leafNDVI transmission

- **Named Entity**: 192
  - Shanghai International Settlement
  - John Steiner
  - milgram

- **Other**: 6
  - https://...
Findings

General observations: Search timing

Session Length

- 50% of sessions are less than 1 minute
- 34% are 1-2 minutes
- 16% are 2+ minutes

User Interactions

- 341 URLs logged in sessions of 1 URL
- 219 URLs logged in sessions of 2 URLs
- 137 URLs logged in sessions of 3 URLs
- 95 URLs logged in sessions of 4 URLs
- 63 URLs logged in sessions of 5 URLs
- 49 URLs logged in sessions of 6 URLs
- 25 URLs logged in sessions of 7 URLs
- 30 URLs logged in sessions of 8 URLs
- 16 URLs logged in sessions of 9 URLs
- 58 URLs logged in sessions of 10+ URLs
User strategies: Overview

- Search term adjustments
- Selection of facets
- Use of advanced search
User strategies: Overview

Search Strategies Used

- None: 532
- Changes to Search Terms ONLY: 221
- Facets ONLY: 109
- Changes AND Facets: 91
- Changes AND Advanced Search: 33
- Changes AND Facets AND Advanced Search: 25
- Advanced Search ONLY: 23
- Facets AND Advanced Search: 6
User strategies: Search term adjustments

1. Search: phone directories
   Results 1 - 25 of 253234 for phone directories

2. Search: phone directories brigham
   Did you mean: 1951- telephone directories for campus?
   Results 1 - 25 of 2708 for phone directories brigham

3. Search: brigham city phone
   Did you mean: brigham city ne?
   Results 1 - 25 of 18180 for brigham city phone
Findings

User strategies: Search term adjustments

<table>
<thead>
<tr>
<th>Types of Changes</th>
<th>Changes to Search Terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Changed some of the search terms</td>
<td>259</td>
</tr>
<tr>
<td>Added search term(s)</td>
<td>254</td>
</tr>
<tr>
<td>Changed all search terms</td>
<td>176</td>
</tr>
<tr>
<td>Removed search terms</td>
<td>132</td>
</tr>
<tr>
<td>Fixed typo</td>
<td>56</td>
</tr>
<tr>
<td>Other</td>
<td>65</td>
</tr>
</tbody>
</table>
User strategies: Search term adjustments (continued)

Use of Search Terms Changes by Search Type

<table>
<thead>
<tr>
<th>Search Type</th>
<th>Search Term Changes Used</th>
<th>Search Term Changes Not Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Known Item</td>
<td>76.9%</td>
<td>23.1%</td>
</tr>
<tr>
<td>Topical</td>
<td>58.4%</td>
<td>41.6%</td>
</tr>
<tr>
<td>Named Entity</td>
<td>77.7%</td>
<td>22.3%</td>
</tr>
<tr>
<td>Other</td>
<td>50.0%</td>
<td>50.0%</td>
</tr>
</tbody>
</table>
Refine by:
- Books & Media (12)
- Articles (8507707)
- Full Text (8507707)
- Peer Reviewed (8507707)
- Format
  - Ebook (4724897)
  - Academic Journals (4184875)
  - Conference Materials (430165)
- Magazines (278907)
- News (252979)

Results 1 - 25 of 8507719 for search terms here

Communication about suicide in YouTube videos: Content analysis of German-language videos retrieved with method-and help-related search terms
Niederkotthen, Thomas; Schachter, Ronja; Till, Benedikt
Academic Journal | In Psychiatry Research August 2020 290
Highlights+Videos on suicide on Youtube contain more potentially harmful then protect... more

CHAPTER 5: How to Do Your Own Trademark Search.
Fahman, Stephen
more

The robots are here, but are nurse educators prepared?
McAllister, Margaret; Kelkenbourn, Krysalis; Wood, Denise
Academic Journal | In Collegian January 2019
Background As robotics continues to be applied to medical and nursing practice, nurses ... more

Art and resistance : studies in modern Indian theatres / Dorothy Figueira
Figueira, Dorothy Matilda, 1955- author.
Print DDA books discovery | 2019

CHAPTER 10: EAST Meets WEST.
Hitchcock, David
Additional actions:
User strategies: Facets

Facet Categories Selected

- Articles: 290
- Format: 170
- Books & Media: 65
- Publish Date: 49
- Language: 20
- Collection: 19
- Journal: 15
- Tag: 5
- Category: 2
- Content Provider: 2
- Publisher: 1
User strategies: Facets (continued)

Facet Categories Selected

- Articles: 290
- Format: 170
- Books & Media: 65
- Publish Date: 49
- Language: 20
- Collection: 19
- Journal: 15
- Tag: 5
- Category: 2
- Content Provider: 2
- Publisher: 1

Article Facets

- Articles: 15
- Peer Reviewed: 97
- Full Text: 73
User strategies: Facets (continued)

Facet Categories Selected

- Articles: 290
- Format: 170
- Books & Media: 65
- Publish Date: 49
- Language: 20
- Collection: 19
- Journal: 15
- Tag: 5
- Category: 2
- Content Provider: 2
- Publisher: 1

Format Facets
- Academic Journals: 11
- Ebook: 18
- Magazines: 12
- Book (Print): 8
- Electronic Resources: 6
- News: 4
- Conference Materials: 3
- ...
Facet Categories Selected

- Articles: 290
- Format: 170
- Books & Media: 65
- Publish Date: 49

Language Facets

- English: 15
- Spanish: 3
- French: 1
- Portuguese: 1
- German: 1
User strategies: Facets (continued)

Use of Facets by Search Type

- Known Item: 89.4% Facets Used, 10.6% Facets Not Used
- Topical: 68.7% Facets Used, 31.3% Facets Not Used
- Named Entity: 67.8% Facets Used, 32.2% Facets Not Used
- Other: 100.0% Facets Used

Facets Used vs. Facets Not Used
User strategies: Advanced search

Advanced Search

Findings

🔍🔍

t:(tables for supersonic flow around cones) a:(kopal)

Title

tables for supersonic flow around cones

Author

kopal

Add boolean:

AND  OR  NOT

Books & Media

Format:

ANY

Language:

ANY

Collection:

ANY

Year:

Search  Reset search
### Findings

#### User strategies: Advanced search

**Advanced Search Options Applied**

<table>
<thead>
<tr>
<th>Search Options</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keyword</td>
<td>124</td>
</tr>
<tr>
<td>AND</td>
<td>108</td>
</tr>
<tr>
<td>Author</td>
<td>41</td>
</tr>
<tr>
<td>Title</td>
<td>24</td>
</tr>
<tr>
<td>Language</td>
<td>20</td>
</tr>
<tr>
<td>Format</td>
<td>14</td>
</tr>
<tr>
<td>OR</td>
<td>8</td>
</tr>
<tr>
<td>Year</td>
<td>7</td>
</tr>
<tr>
<td>Subject</td>
<td>6</td>
</tr>
<tr>
<td>Collection</td>
<td>2</td>
</tr>
<tr>
<td>NOT</td>
<td></td>
</tr>
</tbody>
</table>
Findings

User strategies: Advanced search (continued)

Use of Advanced Search by Search Type

- Known Item: 94.7% Used, 5.3% Not Used
- Topical: 89.2% Used, 10.8% Not Used
- Named Entity: 88.4% Used, 11.2% Not Used
- Other: 100.0% Used, 0.0% Not Used
🔍🔍 User strategies:
💎 Advanced search vs. facets

User Choice of Advanced Search or Facets Where Both Options are Available

- Format: 220 (Facets), 14 (Advanced Search)
- Year: 46 (Facets), 6 (Advanced Search)
- Language: 20 (Facets), 20 (Advanced Search)
- Collection: 19 (Facets), 2 (Advanced Search)
Search effectiveness: Search-term adjustments

System Alternatives to Search-Term Adjustments

<table>
<thead>
<tr>
<th>Option</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>677</td>
</tr>
<tr>
<td>Change WAS handled by the system</td>
<td>114</td>
</tr>
<tr>
<td>Advanced Search</td>
<td>86</td>
</tr>
<tr>
<td>Did you mean?</td>
<td>17</td>
</tr>
<tr>
<td>Facets</td>
<td>6</td>
</tr>
</tbody>
</table>

Discovery-System Alternative Options
Findings

🔍🔍 Search effectiveness: Advanced search

43.7% incorrect usage of Advanced Search
Search effectiveness: Number of results

Findings

With No Article Results Available…

53% of searches returned 0 results

Average no. of results per page decreased by 35%
Search effectiveness:

Comparison of search strategy use

Changes to Search Terms Used in Known Item Searches
- No: 18%
- Yes: 82%

Facets Used in Known Item Searches
- No: 14%
- Yes: 86%
Search effectiveness: Discoverability

Position of Known Items in Search Results

<table>
<thead>
<tr>
<th>Position in Results</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>315</td>
</tr>
<tr>
<td>2</td>
<td>233</td>
</tr>
<tr>
<td>3</td>
<td>104</td>
</tr>
<tr>
<td>4</td>
<td>66</td>
</tr>
<tr>
<td>5</td>
<td>50</td>
</tr>
<tr>
<td>6</td>
<td>46</td>
</tr>
<tr>
<td>7</td>
<td>33</td>
</tr>
<tr>
<td>8</td>
<td>26</td>
</tr>
<tr>
<td>9</td>
<td>19</td>
</tr>
<tr>
<td>10</td>
<td>26</td>
</tr>
<tr>
<td>11</td>
<td>17</td>
</tr>
<tr>
<td>12</td>
<td>18</td>
</tr>
<tr>
<td>13</td>
<td>15</td>
</tr>
<tr>
<td>14</td>
<td>16</td>
</tr>
<tr>
<td>15+</td>
<td>133</td>
</tr>
<tr>
<td>N/A</td>
<td>56</td>
</tr>
</tbody>
</table>
## Search effectiveness: Discoverability & deliverability

#### Findings

<table>
<thead>
<tr>
<th></th>
<th>Available</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Appeared in Results</strong></td>
<td>406</td>
</tr>
<tr>
<td><strong>Yes</strong></td>
<td>61</td>
</tr>
<tr>
<td><strong>No</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Discoverability vs. Deliverability of Known Items**
Findings

Search effectiveness: Deliverability

Electronic Access Steps for Known Items

No. of Steps

1  2  3  4  5

Steps Count

210  94  39  4  1
Search effectiveness: Deliverability

Circulation of Physical Known Items

- 86% Not Checked Out
- 14% Checked Out

Findings
## User Engagement and Strategies by Search Type

<table>
<thead>
<tr>
<th></th>
<th>Known item only searches</th>
<th>Topical only searches</th>
<th>Both</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Average # pages visited</strong></td>
<td>2 pages</td>
<td>4 pages</td>
<td>7 pages</td>
</tr>
<tr>
<td><strong>Average search session time</strong></td>
<td>3 minutes</td>
<td>7 minutes</td>
<td>14 minutes</td>
</tr>
<tr>
<td><strong>Uses facets</strong></td>
<td>10.6%</td>
<td>31.3%</td>
<td>25%</td>
</tr>
<tr>
<td><strong>Uses advanced search</strong></td>
<td>5.31%</td>
<td>10.8%</td>
<td>15%</td>
</tr>
<tr>
<td><strong>Uses search term changes</strong></td>
<td>22.08%</td>
<td>40.66%</td>
<td>82.5%</td>
</tr>
</tbody>
</table>
Search effectiveness

- Common search strategies are successful
- User searches are suited to web-scale discovery
- Strong relevancy ranking of known items
- Users want full text
- Electronic access is relatively seamless; some physical circulation
Unanswered questions

How much do tool defaults influence search strategy?
What user behaviors would likely be consistent no matter the tool?
How can we reduce specific types of failed searches?
Did users find the best resources, especially in topic searches?
How effective is our collection of materials (apart from discoverability)?
Conclusion

Any questions?

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