



Scholarly Usage Based Recommendations: Evaluating bX for a Consortium

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Agenda

- Recommender systems and evaluation methods overview
- Introduction to SFX, Primo, and bx in OCUL
- Findings to date in OCUL usage data
- Focus groups at Waterloo
- Future plans for bx evaluation at OCUL

Scholarly Recommender Systems

<p>Synthese (Vellino, 2010)</p>	<p>Content -based</p>	<ul style="list-style-type: none"> - STM digital collections - Considers bibliographic citations in articles as 'preferences' 	<ul style="list-style-type: none"> - Tested 1886 articles which generated 1.9 million recommendations - Compared to bX: - Produced similar # recommendations - High 'semantic diversity' of recommendations
<p>Google Wave-based system (Serrano-Guerrero <i>et al.</i>, 2011)</p>	<p>Content -based</p>	<ul style="list-style-type: none"> - Groups of researchers and resources (categorised via ScienceDirect) - If algorithm determines that user-suggested new resources relevant for wave/s , suggestion sent to wave administrator for approval 	<ul style="list-style-type: none"> - Prototype tested 7 waves of 34 researchers and 83 resources - Resources considered "well-inserted" by wave administrators, with low percentage of missed resources
<p>Context-aware Citation Recommendation using CiteSeerX (He <i>et al.</i>, 2010)</p>	<p>Content -based</p>	<ul style="list-style-type: none"> - Uses overall context of document and local surrounding words to produce ranked set of citations 	<ul style="list-style-type: none"> - Tested 450,000 pre-2008 articles - Title and abstract used for global context - 50 words before and after placeholder used as local citation context - Evaluated 3 measures of relevance and found to be effective compared to other systems
<p>SmartSearch (Steinberg <i>et al.</i>, 2010)</p>	<p>Content -based</p>	<ul style="list-style-type: none"> - MeSH headings mapped to 130 resources and user queries - Recommendations generated based on frequency of common headings returned 	<ul style="list-style-type: none"> - Goal was promotion of library resources - Measured user click-through rates to suggested resources - Statistically inconclusive positive

Scholarly Recommender Systems (cont'd)

<p>Bx (Bollen & Van de Sompel, 2006)</p>	<p>Usage-based</p>	<ul style="list-style-type: none"> - Usage data for user community aggregated by openURL linking - Data harvested by OAI-PMH 	<ul style="list-style-type: none"> - Tested using SFX linkage data from 9 CalState institutions and 2 million unique referents - Journal relationships established via PageRank algorithm - Potential privacy issue can be resolved using anonymized session IDs
<p>Melvyl Recommender Project (Whitney & Schiff, 2006)</p>	<p>Usage-based (circulation data from UCLA)</p>	<ul style="list-style-type: none"> - Anonymous but persistent patron IDs - Large volume of data (~9 million transaction records) - Weighted recommendations based on common checkouts, filtered by call number similarity 	<ul style="list-style-type: none"> - Checkout = +ve rating?? - Small user study (10 undergrads and grad students) - Survey and think-aloud tasks
<p>Personal Ontology Recommender (PORE) system (Liao <i>et al.</i>, 2010)</p>	<p>Hybrid</p>	<ul style="list-style-type: none"> - Uses loan history of patron to establish “personal ontology” of CCL or DDC categories and keywords used - Finds similar users based on keyword overlap in loan records - Recommends items based on frequency of keyword overlap 	<p>n/a</p>

Evaluation Approaches for Recommender Systems

- One formula to rule them all? (del Olmo & Gaudioso, 2008)
- Offline and online tests
- User studies
- Properties of interest should be identified first (Shani & Gunawardana, 2011):
 - Accuracy, ranking, novelty, serendipity, coverage, confidence, trust, diversity, utility, risk, robustness, privacy, adaptivity, scalability

Previous Evaluations

- Bx:
 - Kansas State, presented at ELUNA, faculty survey delivered through email
 - CISTI comparison of Synthese (their content-based system) and bx
- Melvyl Project:
 - CDL OPAC recommender system evaluated through focus group. Tested both collaborative filtering and metadata/content-based recommenders.

Our Context: SFX bx and Primo in OCUL

- OCUL is a consortium of 21 university libraries in Ontario with a shared technology infrastructure
- Licensed and locally hosted SFX instances for all members since 2004
- Current Primo beta at the TUG group (Guelph, Waterloo and Wilfrid Laurier)
- Various discovery systems at other schools
- TUG group started bx trial in summer 2010 The rest of OCUL began February 2011
- Activated by 8/21 OCUL schools to date.

Configuration Options used in OCUL

- Display SFX button for all recommendations: 8/8
- Recommend only full text articles: 1/8 (Waterloo)
- Display “full text available” image: 2/8
- Direct link to full text articles: 2/8
- Contributing Data: 0/8
- Most show default 3 recommendation, Carleton shows 10.

Approach to Evaluating bx in OCUL

- SFX queries: 1,2, 4, 11
 - Frequency of recommendations generated
 - Frequency recommendations clicked on
 - Ratio of recommendations followed: menus displaying recommendations
 - Titles found through bx
 - Relationship (?) between bx and ILL requesting
 - Relationship (?) between recommendations and other SFX target service use

Approach to Evaluation bx in OCUL

- Relationship (?) between configuration choices and get recommendation clickthroughs
- Focus Groups (include undergrads next)
- Surveys
 - Building on work at Kansas State by Jamene Brooks-Kieffer

OCUL Usage Data Findings

- 6 month period: February to July 2011
- Ratio of recommendations clicked/menus showing recommendations is 2.5:1
- Recommendations are shown for an average of 30 % of menus in OCUL
- Clickthrough Rate of recommendations followed varies a lot by school. Waterloo is lower at around 3% while some others are over 10%

OCUL Usage Data Findings (2)

- Relationships? Too early to tell, but for now...
 - ILL is not increasing
 - Get holding service seems to be decreasing the most as clickthroughs rise for recommendations
 - ILL requests from bx as the source is low
 - ILL requests from SFX were 22% of the total ILL borrowing and almost 50% of journal article requesting in 2010. This has risen steadily since it became available in 2007/8.

Focus Groups - Waterloo

- Questions derived from previous evaluations (Kansas, CDL, Guelph)
- Primo context for recommendations

bX Recommender @ University of Waterloo Library



bX Recommender @ University of Waterloo Library

- June 10, 2011 bX Recommender activated in Waterloo's Primo Central trial view

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- Assessment Goal – learn more about user preferences and success in using Primo Central - including bX Recommender

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- bX Recommender early findings
- During the period from Aug. 22 – Sept 2., 12 students (8 undergrad, 4 grad) were interviewed

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- Goal – to determine:
 1. What students think of recommender services
 2. What students think of actual bX Recommendations
 3. Get some feedback on the “usability” of the service

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- Findings:
 - Overall, the students are generally positive about services that provide recommendations

bX Recommender @ University of Waterloo Library

- Findings:
 - *“It’s good to know what other people found and actually used. It can save you a lot of time searching”*

bX Recommender @ University of Waterloo Library

- Findings:

1. high expectations that the recommendations will yield useful information

bX Recommender @ University of Waterloo Library

- Findings:
 1. high expectations that the recommendations will yield useful information
 2. there is an expectation that recommended articles will be available online

bX Recommender @ University of Waterloo Library

- Findings:
 1. high expectations that the recommendations will yield useful information
 2. there is an expectation that recommended articles will be available online
 3. if the recommendations are not useful, students will abandon use of the service

bX Recommender @ University of Waterloo Library

- Findings:
 - When performing a search for “global warming” users generally thought article recommendations were relevant

bX Recommender @ University of Waterloo Library

- Findings:
 - When performing a search for “global warming” users generally thought article recommendations were relevant
 - However, they were quick to pick up on the ones that seemed out of place

bX Recommender @ University of Waterloo Library



Article

Global warming

GILBERT, DAVID

Nature, 1990, Vol.346(6282), p.310-310 [Peer Reviewed Journal]

Full text available

Online resource

Details

Reviews & Tags

Recommendations

Send to

4. ONISHI, Akira [The impact of CO2 emissions on the world economy Policy simulations of FUGI global model](#) Journal of policy modeling 29.6 (2007) 797-819
5. Hansen, J. [Climate Impact of Increasing Atmospheric Carbon Dioxide](#) Science 213.4511 (1981) 957
6. Lashof, Zindel A [Relative contributions of greenhouse gas emissions to global warming](#) Nature 344.6266 (1990) 529-531
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9. Broecker, W.S. S [Fate of Fossil Fuel Carbon Dioxide and the Global Carbon Budget](#) Science 206.4417 (1979) 409-418
10. Houghton, Houghton [Global warming](#) Reports on Progress in Physics 68.6 (2005) 1343-1403

bX Recommender @ University of Waterloo Library

- Findings:
 - Students were asked if they thought they might have found these articles if they had not been listed as a recommendation

bX Recommender @ University of Waterloo Library

- Findings:
 - Overall usability (design, ease of use, how information is presented & organized)

bX Recommender @ University of Waterloo Library

- Findings:
 - Students thought it was “pretty straight forward”, “easy to use”, “convenient”

bX Recommender @ University of Waterloo Library

- Findings:
 - Students thought recommendations were “hidden”

bX Recommender @ University of Waterloo Library

- Findings:
- There was some confusion about the different citation styles that students encountered when they looked at the recommendations.

bX Recommender @ University of Waterloo Library

- Findings:



Article

- Global warming**
GILBERT, DAVID
Nature, 1990, Vol.346(6282), p.310-310 [Peer Reviewed Journal]
Full text available

[Online resource](#) [Details](#) [Reviews & Tags](#) **[Recommendations](#)**

Send to

bX Users interested in this article also expressed an interest in the following:		About bX
1. BROECKER, Wallace S. CLIMATIC CHANGE - ARE WE ON BRINK OF A PRONOUNCED GLOBAL WARMING Science 189.4201 (1975) 460-463		
2. DICKINSON, R.E. E FUTURE GLOBAL WARMING FROM ATMOSPHERIC TRACE GASES Nature 319.6049 (1986) 109-115		
3. Kuzyakov, Yakov Priming effects: Interactions between living and dead organic matter Soil biology & biochemistry 42.9 (2010) 1363-1371		
4. ONISHI, Akira The impact of CO2 emissions on the world economy Policy simulations of FUGI global model Journal of policy modeling 29.6 (2007) 797-819		

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bX Recommender @ University of Waterloo Library

- Findings:
 - Thumbs up/thumbs down – how does this work?
 - *“Does that get saved to your user account, like if you like it or don’t like it?”*
 - *It would be nice to see “numbers like 3/5 people liked this article”*

bX Recommender @ University of Waterloo Library

- *“I think it’s fantastic. I’m a big fan of recommendations ... if nothing else, it makes research easier ... I might not think of all the things that other people thought of that did similar research and found similar things. So it’s nice to kind of have the Internet hive mind working to my advantage”*

Next Steps – OCUL and Institutional Levels

- Work with the bx api
- Analyze longer-term usage stats
- Contribute data and assess whether this improves our recommendations
- Get feedback from undergraduate students

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