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Federated Searching in an Age of Web Services Newton, Glen

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Federated Search in an Age of Web Services

Glen Newton CISTI Research

National Research Council Canada

Michael Fortin, Concordia University

Access 2005

October 17-19 2005



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Outline

- Original Problem
- Initial solution
- Experimentation
- Implications
- Conclusion

Two Important Points

- This is a talk on federated search

Two Important Points

- This is a talk on federated search
- This is NOT a talk on federated search

Original Problem Part 1

- Canadian government has standard look & feel for web pages, known as “Common Look and Feel” (**CLF**)
- Includes accessibility, design, navigations, official languages, metadata, etc.
- All web sites must comply (limited exceptions)
- Sometimes difficult to make compliant

Original Problem Part 1

- CISTI has web interface to Catalogue (Innovative)
- Not CLF compliant



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Year

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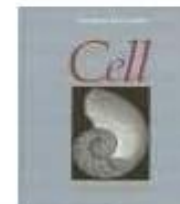
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Original Problem Part 2

- NRC has adopted a commercial content management system (CMS) for managing web sites (Interwoven *TeamSite*)
- Proprietary, but relatively open, using XML & other standards
- Web sites & applications to migrate to CMS
- CLF templates
- While the CMS understands HTML, XML, JSP, ASP, PHP, servlets, etc. did not understand the catalogue web interface
- **How to migrate the Web view of the catalogue to CLF and into the CMS**

Initial Solution

- “Bridging” Web application which the CMS would understand, and which could talk to catalogue
- PHP 5
- Used Z39.50 to query catalogue
- Could be embedded into CMS
- Due to Z39.50 performance & connection dropping issues, used YAZ Z39.50 accelerating & caching Z39.50 proxy
- Implemented using Linux, Apache, PHP 5

Initial Solution (Problems)

- Z39.50 problems: server could not handle sustained, but not high level, of queries
- Connections would be dropped, new connection attempts would time-out
- Due to Z39.50 performance & connection dropping issues, used YAZ accelerating & caching Z39.50 proxy



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Cell .	1974-
Gekkan saibô =	[1969]-1999.
Introduction to bioinformatics :	c2003.
Life, the science of biology /	c1992.
Molecular biology of the cell /	c1989.
Molecular cell .	c1997-

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Alternate Author Alberts, Bruce.

Title Molecular biology of the cell / Bruce Alberts ...
 [et al.].

Edition 2nd ed.

Publisher New York : Garland Pub., c1989.

ISBN 0824036956
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Call Number

QH581.2 M718 1969

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Initial Solution Completed

- Successfully showed that a view of the Catalogue could be moved to both the CMS and to CLF
- Altered (“cleaned up?”) web GUI
- Limitations:
 - Could not limit to specific collections (only electronic, etc)
 - Could not build patron web GUI using Z39.50

What next?

- Having the application built using PHP, this allowed for easy extensions
- AJAX (Asynchronous Javascript and XML) ?
- Other Z39.50 databases ?
- Other non-Z39.50 databases ?

Experimentation

- Having the application built using PHP, allowed for easy extensions
- First extension was to move to AJAX (Asynchronous Javascript and XML)
- Search of other Z39.50 databases
- Search of PubMed using HTTP REST
- Search of Amazon using Web Services
- Use Web Services to get cover art from Amazon
- Search of our own metadata database (MySQL)



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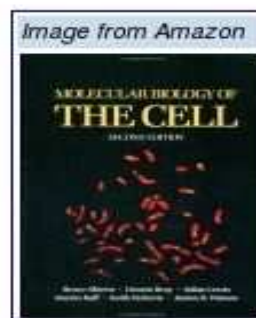
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ISBN	Title	Publisher	Publication Date	# of Pages	List Price
0824036956	Molecular Biology Of The Cell	Garland Publishing, Inc.	1989	1308	CDN\$ 89.50
0824036964	Molecular Biology of the Cell	Taylor & Francis	1989-06		CDN\$ 63.54

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Cell Phones: Invisible Hazards in the Wireless Age: An Insider's Alarming Discoveries about Cancer and Genetic Damage	2000-11-27
The Dictionary of Cell & Molecular Biology	1999
Tom Clancy's Splinter Cell	2004-12-06
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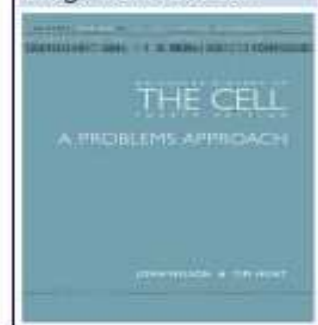
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Author John Wilson; Tim Hunt
Title Molecular Biology of the Cell: A Problems Approach
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Date Published 2002

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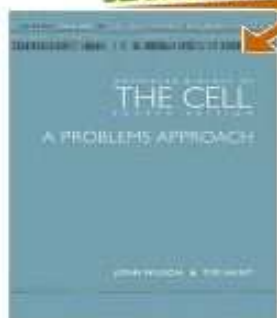
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Calcification as an indicator of osteoinductive capacity of biomaterials in osteoblastic cell cultures.	Biomaterials	Aug/2005
Influence of carboxyl group density on neuron cell attachment and differentiation behavior: Gradient-guided neurite outgrowth.	Biomaterials	Aug/2005
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Influence of stirring-induced mixing on cell proliferation and extracellular matrix deposition in meniscal cartilage constructs based on polyethylene terephthalate scaffolds.	Biomaterials	Aug/2005
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Cell -free studies on the synthesis and regulation of alpha-fetoprotein / by David Wayne O'Keefe.	O'Keefe, David Wayne.		1975.
Cell -mediated immunity in breast carcinoma patients / by Julie P. Deans.	Deans, Julie P.		1975.
Cell division and macromolecular synthesis in <i>Tetrahymena pyriformis</i> : the action tetrahydrocannabinol, morphine, levorphanol and levallorphan / by Daniel K. McClean.	McClean, Daniel K., 1944-		1972.
The cell envelope of <i>Rhizobium meliloti</i> in relation to nitrogen-fixing effectiveness / by Colin Roger MacKenzie.	MacKenzie, Colin Roger.		1973.
The cell / Horst Beenek. Introd. by Daniel Berrigan. Translated from the	Bienek, Horst, 1930-		c1972, 1973

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Creating good user interfaces for search results

- 1) One source containing one kind of metadata: **very easy**
- 2) 5-8 sources containing one or a small number of kinds of metadata: **fairly easy** (we did this)
- 3) Many sources containing many different kinds of metadata:
heavy lifting involved

AJAX

- Asynchronous Javascript And XML
- Important step in Web-based applications becoming more desktop GUI-like, with finer level of interaction granularity (no more “full-in-form-and-submit” entire page update cycle)
- [Google maps](#) best known AJAX-driven application
- While initially rather complicated to implement applications using AJAX, toolkits are becoming mature for most programming languages making implementation very easy and flexible

Amazon Web Services

- Very rich Web Services API allowing searching by various metadata (ISSN, title, author, etc)
- Ability to request cover art for books, CDs, etc. via API
- Additional Amazon information also available, like reviews, ratings, wish lists, etc.
- If you become an Amazon partner, any users who make purchases at Amazon, you get a cut from the purchase

Amazon Web Services: *Caveats*

- Make sure you read the
Amazon Web Services Licensing Agreement
- Peace Palace Library, The Netherlands

Implications

- Explosion of Web Services by many disparate players beyond the initial few (Google API, Google Scholar API, Amazon, etc)
- M2M becomes basis of applications
- Services Oriented view of the universe
- Z39.50 history of library world puts it in good standing
- (Yet still more!) legal & licensing issues with which to deal
- Rich applications with better & more responsive GUI presenting users with information from a number of

Conclusion

- Able to build prototype embedding Web view of catalogue into CMS & compliant to CLF
- Open standards helped(Z39.50 to communicate to Catalogue; XML & others with CMS; Web Services)
- Easily implemented using Open Source (PHP, Apache, Linux)
- Issues also resolved using Open Source & open standards (YAZ Z39.50 proxy)
- Implications of proliferation of Web Services and AJAX signify major change in the Web



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<http://www.amazon.com/gp/aws/landing.html>
- Canadian Government Common-Look-and-Feel standards and guidelines: http://www.tbs-sct.gc.ca/clf-nsi/index_e.asp
- Innovative Interfaces: <http://www.iii.com/>
- Interwoven Teamsite CMS: <http://www.interwoven.com/>
- PHP: <http://www.php.net/>
- PubMed scripting page:
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