Using Visual Feedback to Improve Article Searches

Steven F. Vella
Faculty of Business
Charles Sturt University
Wagga Wagga, Australia
svella@postoffice.csu.edu.au
Intelligent Question Routing Systems (IQRS)

Linking people with questions to those with answers.

Here are some IQRS approaches

- iLink
- Probabilistic Latent Semantic Analysis in Community Question Answering portals (CQA)
- Question routing framework
- Routing in forums
- G-Finder
- Aardvark
- Confucius
- Yahoo! Answers recommender system
- Segmented topic model in CQA
- Classification-based routing in CQA
- Social query model

Three issues suggested for future research

Visual feedback to automate accurate and unambiguous questions

Knowledge profiles to match questions in spite of typos and words with the same meanings

Knowledge profiles from internal and external sources of information


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An example of visual feedback

An application in Education

Researching ICT management from the perspective of the school executive

School executive leverage learning skills for training, staffing and funding shortfall

S. F. Vella, “Managing information and communication technology (ICT) in NSW government schools with a low socioeconomic status (SES) from the perspective of the school executive,” unpublished.
The question

Is there a relationship between visual feedback and asking accurate and unambiguous questions to get useful answers?
The null hypothesis

Probably not!

The alternative hypothesis
there probably is!
The experiment

A scenario
The school principal shortens a meeting to address a Facebook issue at school
Method

1 x PrimoSearch engine
search terms (facebook issues school)
materials: Journal articles
date range: since 2013
Sort order: popularity
The PrimoSearch engine

Visual Feedback in Article Searches

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Method (cont)

1 x IQRS simulation
Excel: Cut and paste
20/50/100 journal names and subject values
1 x IQRS simulation

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Back in the game: longtime administrator Attila J. Weninger</td>
<td>School Districts</td>
</tr>
<tr>
<td>Social media as a destination marketing tool: its use by natïcDmos</td>
<td>Social Media; Twitter; School Of Tourism</td>
</tr>
<tr>
<td>The Risks of Internet Communication 3</td>
<td>Cyberbullying; sexting; internet attacks; sexual offenders; cyberbullying; Facebook</td>
</tr>
<tr>
<td>Building Culturally Responsive Communities</td>
<td>Culturally Responsive Instruction; Classroom Management; Urban Schools</td>
</tr>
<tr>
<td>Tensions Across Federalism, Localism, and Professional Aut Accountability</td>
<td>Policy Implementation; Professionalism; Technology; Education Reform</td>
</tr>
<tr>
<td>Dysfunctional disloyalty standards in employee criticism</td>
<td>Employee Loyalty -- Standards; Employment At Will -- Laws, Regulations And Rules</td>
</tr>
<tr>
<td>Influences of media on social movements: Problematizing the Digital divide; Egypt; Empowerment; Facebook revolution; Kenya; Mobile telephony</td>
<td>Social Network Sites and Young Adolescent Identity Develop</td>
</tr>
<tr>
<td>The shadow power list: who really runs Britain? The new est Gas Utilities -- Contracts</td>
<td>Gas Utilities -- Political Aspects; Social Services -- Political</td>
</tr>
</tbody>
</table>

The Future of Music Education

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Method (cont)

1 x IQRS simulation

Excel: Tidy the data

Remove duplicate spaces, blank lines, double dashes (in sub-subjects), place 1 subject per line, sort them alphabetically and change spaces to ~.
**Visual Feedback in Article Searches**

1 x IQRS simulation

<table>
<thead>
<tr>
<th><strong>A</strong></th>
<th><strong>B</strong></th>
<th><strong>C</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>55 Juvenile~delinquents</td>
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<tr>
<td>56 Learning~communities</td>
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<td>57 low-income</td>
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<td>58 Maltreatment</td>
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<td>59 Measurement</td>
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<td>60 Medical~education</td>
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<td>61 Mobile~applications</td>
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<td>62 Nutrition~education</td>
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<td>63 Online~campaigns</td>
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<tr>
<td>64 Online<del>social</del>networking</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Method (cont)

1 x IQRS simulation

wordle.net:

Cut and paste the subject list

Change the default: Font, number of words, alphabetic order, rounder edges and colour
1 x IQRS simulation
Method (cont)

1 x PrimoSearch engine
Refine the search terms
facebook “social issues” schools
Facebook bullying schools
Method (cont)

Experiment features

Dependant variables: keywords

Repeatable: for 20, 50 and 100 records

Word image varies with quantity

Accurate with controlled variables
## Results

**Key word search:** 12,835 journal articles

**Add filters**

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Search</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013 Journal articles + Any field contains</td>
<td>facebook issues school</td>
<td></td>
<td>facebook &quot;social issues&quot; schools</td>
<td>facebook bullying schools</td>
</tr>
<tr>
<td>Totals</td>
<td>1,395</td>
<td>44</td>
<td>80</td>
<td></td>
</tr>
</tbody>
</table>

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Results

As more journal articles were returned:

More data was available but also missing

From three publishers

<table>
<thead>
<tr>
<th>Journal articles</th>
<th>Subject records</th>
<th>Journal articles without subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>118</td>
<td>2</td>
</tr>
<tr>
<td>50</td>
<td>291</td>
<td>5</td>
</tr>
<tr>
<td>100</td>
<td>503</td>
<td>19</td>
</tr>
</tbody>
</table>
Discussion

Word clouds were created

Resulting in changing the word “issue” to “social issues” and “bullying” “school” to “schools”
Discussion

Article counts improved
From
nearly 1,400 journal articles
to
under 100.

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Discussion

Do the number of journals articles returned improve the results?
Some words disappeared and others showed up as record numbers increased.
Women, Australia and technology
Discussion

But do the articles answer the question asked?

Worth investigating
Discussion

Would a second IQRS simulation improve the results?

Also worth investigating
Discussion

What about journal articles without subjects?

More found as more journal articles were retrieved. Is data not supplied with journals from some publishers?
Discussion

Automation

If this process could be automated:
a larger sample could be tested and
further iterations done
Conclusion

Is there a relationship between visual feedback and asking accurate and unambiguous questions to get useful answers?

The experiment does not support the null hypothesis.
Conclusion

Instead it supports the alternate hypothesis that

Visual feedback may be useful to help ask accurate and unambiguous questions to get useful answers
Conclusion

Limitations

Sample: less than 100 journal articles used
Accuracy: lowered with more returned articles because articles without subjects increased
Reliability: Depends on article having subjects
Conclusion

Suggested research

To find a way to automate the process
Increase the sample size
Attempt to use visual feedback for more than one search iteration
Conclusion

Application

Search engine providers may:

• be interested in applying these findings
• have resources to automate the process and
• be able to source keywords from fields other than subject when the subject is missing a value