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Requirements for expertise location systems in biomedical science and the Semantic Web

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Introduction

- collaboration on the rise in biomedical science
- expertise location challenging problem
- expertise locating systems (ELS):
a new way?
- Semantic Web: new opportunity, but will it solve the problem?



Sample ELSs

- Community of Science: www.cos.com
- LinkedIn: www.linkedin.com
- Index Copernicus Scientists:
scientists.indexcopernicus.com
- BiomedExperts: www.biomedexperts.com
- Research Crossroads:
www.researchcrossroads.com
- ResearchGate: www.researchgate.net



Study objectives

- begin to define requirements for expertise location systems for biomedical scientists
- discuss requirements in relation to the Semantic Web



Methods

Multi-method approach:

- affinity diagramming to identify key issues
- literature review to extract requirements
- contextual inquiries
(10 biomedical scientists at CMU and Pitt)
- semi-structured interviews
(30 scientists at Pitt)
- grounded theorizing approach



Results

- 1. The effort required to create and update an online profile should be commensurate with the perceived benefit of the system.*



Results (cont.)

- 2. Online profiles should include rich and comprehensive information about potential collaborators in order to optimize the cost/benefit ratio of collaboration decisions.*



Results (cont.)

3. *Online profiles should to be up-to-date, because some information they contain has a short lifespan.*



Results (cont.)

4. *Researchers should be able to exploit their own and others' social networks when searching for collaborators.*



Results (cont.)

5. *The system should model proximity, which influences the potential success of collaboration in several respects.*



Results (cont.)

- 6. The system should facilitate the assessment of personal compatibility, similarity of work styles and other “soft” traits influencing collaboration.*



Results (cont.)

7. *Social networks solely based on co-authorship may only partially describe a researcher's collaborative network.*



Results (cont.)

8. *The system should account for researchers' preferences regarding privacy and public availability of information about them.*



Results (cont.)

9. *The system should provide methods to search effectively across disciplines.*



Results (cont.)

10. The system should help make “non-intuitive” connections between researchers.



Semantic Web: A platform for ELS?

Some possibilities:

- mine “digital tracks” for expertise and activity data (e.g. through SLOCs)
- leverage FOAF systems for social network construction
- integrate data from other sources, such as collaborative work environments
- integrate information *about* an individual, e.g. SCI cited references information



Some possibilities (cont.)

- searching across content domains and social spaces
 - semantic mapping among different ontologies
 - traverse social networks
- other design challenges
 - information/UI design
 - balancing private/public information
 - sensitivity/specificity of matches



Discussion

- ELS must meet a diverse and complex set of requirements.
- Some of the requirements are contradictory or difficult to meet.
- Cost/benefit to individual scientist is of paramount importance.



Discussion (cont.)

- Requirements need to be validated and expanded with other scientists, and in additional contexts and settings.
- Generalizability to other scientific domains should be explored.



Future research directions

- operationalize requirements*
- elucidate implicit contradictions
- understand the complex decision-making process of picking a collaborator better
- translate requirements into applications, incl. on Semantic Web
- define measurements for ELS performance

* see <http://www.jmir.org/2008/3/e24>





Grand Tetons, Wyoming, 10/2001

Thank you for your attention!

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