Development of User-configurable Information Source Pages for Medical Information Retrieval

Yalini Senathirajah, MA¹, Suzanne Bakken, RN, DNSc¹²
¹. Department of Biomedical Informatics and ²School of Nursing, Columbia University, NY, NY

Abstract
We describe the creation and evaluation of an online system which allows users to configure information delivery as filtered feeds, extracts from medical text information, and other resources in user-configurable layouts. The need for such a resource, expected advantages and findings with respect to speed of access, effectiveness of alerting, user priorities, information exchange among colleagues, serendipity effects, and usability are discussed.

The problem
Review of the literature on clinical information needs reveals that belief in the existence of definitive answers, time constraints, urgency, and the need to aggregate information from different sources are all factors influencing the decision to seek information and search success (1). Studies also reveal that literature search is a major use of the internet for practicing physicians in the US (2). Current methods of providing access include the provision of links to databases, journals, and medical texts, and links from within clinical information systems. Users must usually search for the appropriate source link and then search within the source; such interfaces are not usually customizable for individual users. In addition they may require visiting multiple sites or parts of an EMR, or require the user to search through volumes of text to find small pieces of information; as in the medical reference UpToDate.

Recent advances in internet technologies have been collectively described under the name ‘Web 2.0’, to emphasize the qualitatively different nature of technologies which allow widespread user participation, creation, acquisition, aggregation and repurposing of small chunks of information for different, often user-defined, purposes. Such systems have been successful in substantially reducing the time for keeping abreast of literature in other areas, notably journalism. In addition they present the opportunity for collaboration and information transfer at very granular levels through the use of opml exchange and other means. While this has not yet been much exploited in science and medicine, it has been suggested (3-5).

System Description
Features of a possible Web 2.0 system to meet clinical information needs include:

- drag-and-drop configurable views so that users could select and layout existing information feeds, including clinical information such as notes, lab results, visualization tools, alerts, protocols, without programmers. This is expected to increase user engagement, decrease resistance to the system, reveal useful information about user priorities and mental representations, increase user expectation of finding useful answers, and assist in future system design.
- user-selectable filtering, use of keywords and other search methods, cross-linking of resources (6).
- creation of feeds from text-based resources such as UpToDate to permit granular search/notification without the user having to search large areas of text
- creation of common, granular formats to decrease cognitive load in searching and allow exchange of materials between scientists or clinicians. (4)

AJAX and server-side scripting methods will be used to implement these features.

Evaluation with respect to access speed, alert effectiveness, user priorities, information exchange among colleagues, serendipity effects, and usability will be carried out through formal usability testing, logfile analysis, tracking mechanisms built into the system, and surveying-structured interviewing. Evaluation with a few clinical users on initial prototypes has been carried out; and work is ongoing.

Acknowledgments
Ms. Senathirajah is funded by LM 007079-15.

References