Specialized Search Tools for Clinical Decision Support

Mahsa Rouzbahman, Mark Chignell *mrouz@mie.utoronto.ca, chignell@mie.utoronto.ca*

hSITE

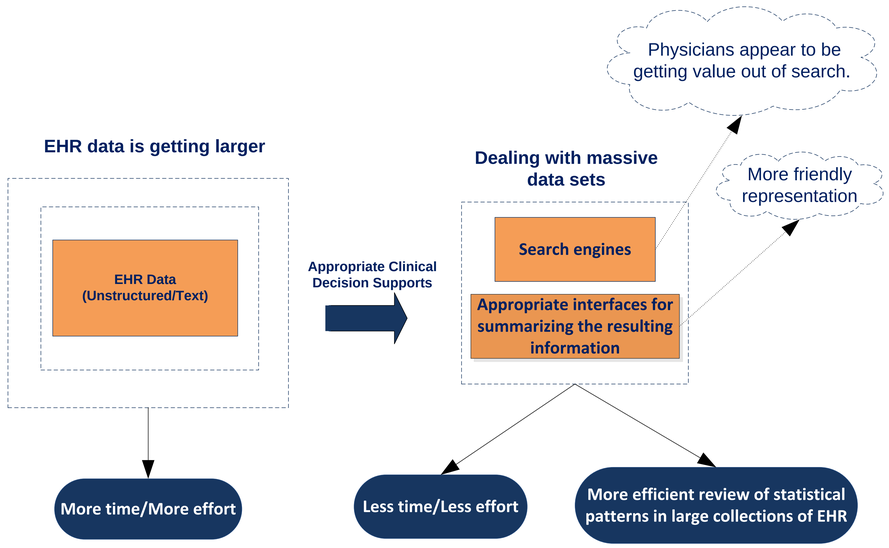
Mechanical and Industrial Engineering
UNIVERSITY OF TORONTO

Google

Interactive MediaLab

Background and Problem Statement

- Appropriate information is critical for clinical decision making.
- Physicians frequently need to carry out search as part of clinical decision making.
- Searching current Electronic Health Records (EHR) is difficult and physicians tend to review individual records manually.
- As EHR data gets larger, clinicians have to dedicate more effort and time to deal with these massive data sets.
- The utilization of generalized search engines in Emergency Departments (EDs) is controversial due to the presence of unreliable information and the associated possibility of decision errors.
- Specialized search tools for clinical decision support are required.



Can search processes be more effectively integrated within clinical decision making ?

How to provide meaningful clinical decision support for physicians based on summaries of similar patients and search process?

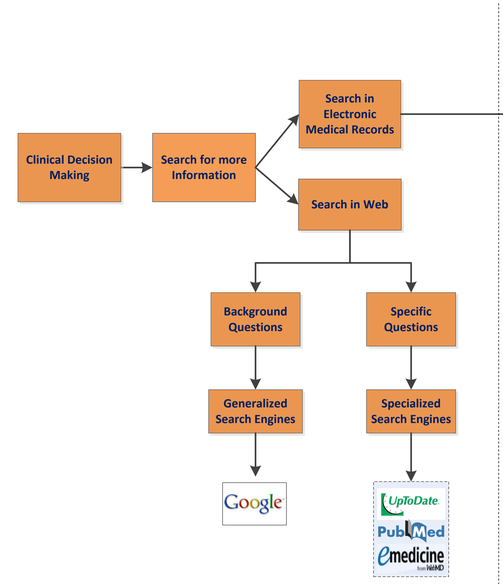
Research Goals

1- Enumeration of requirements for patients information systems in EDs.
2- Developing a physician-centered model of clinically-motivated search.
3- Designing a medium-fidelity prototype clinically-motivated search system.
4- Conducting user testing and focus groups to evaluate the proposed search system.
5- Eliminating potential bugs and redesign the prototypes.
6- Implementing the concept of similar patients in the search process .
(Summaries of similar patients and their treatments and outcomes might be useful for physicians).
7- Measuring how willing physicians will be to have an implicit search process rather than an explicit process under their direct control.

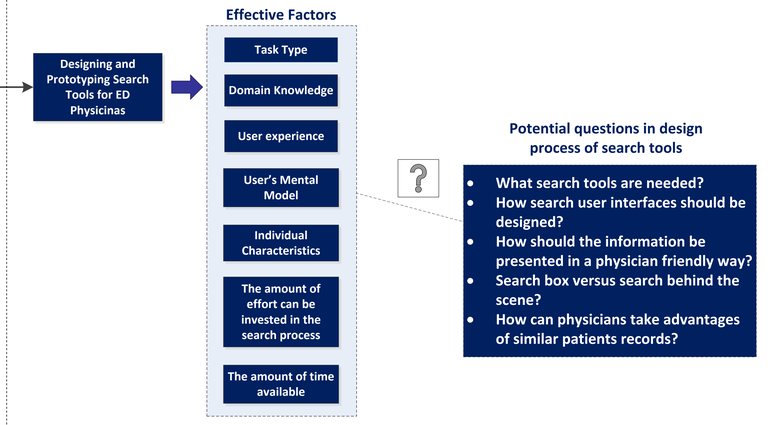
Challenge

Hospitals do not provide easy access to electronic health records, whether due to policy or to limitations in the technology.

Possible Search Usage in EDs



Search User Interface Design



Project Phases

Phase I: Requirement Analysis

Objectives:
The objective in this phase is to determine when and how search is useful In the context of clinical decision making in an emergency department.

Methodology:
- Observational studies of emergency room physicians
- Questionnaires
- Interviews

Phase II: Design and Prototyping

Objectives:
The objective in this phase will be to take the learnings from Phase one and use them to inform the design of a clinically motivated search system.

Methodology:
Paper and pencil prototyping and the development of wireframes.

Two initial prototypes will be developed:
- The first incorporating a more standalone search functionality.
- The second involving search features that are less obtrusive, and integrated into the workflow.

Phase III: Iterative Design /User Testing

Objectives:
- Testing the initial prototypes.
- Establishing the role of search as either a separate and explicit feature or else an integrated (and behind-the-scenes) process.
- Enhancing the prototype, and establishing its level of usability and acceptability for physicians.

Methodology:
- Using a standard iterative design process and successive rounds of prototyping and testing.