



Internet-Based Tools to Enhance Use of Online Health Resources

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Abbreviated Abstract

The purpose of this project is to improve the ability of people to access high quality and individually relevant health information on the Web. Up to 80% of Internet users use it for health information and 81% of online "healthseekers" use a search engine first to find health information. Seventy percent of studies on health Web site quality concluded that quality is a problem. In addition, only about 25% of health seekers consistently assess information quality before use. Unfortunately, current search engines provide millions of generic hits that are often of questionable quality. Poor quality information may result in inappropriate health decisions, unhealthy behaviors, higher healthcare costs, and reduced worker productivity. Current search engines also do not allow users to personalize their search results according to individual needs and preferences. Healia® is a next-generation health search engine that helps people find high quality and personalized health information. Healia uses patent-pending algorithms and methods for machine assessment of quality and numerous other attributes of Web content so that the highest quality and individually relevant search results and messages are presented to the user.

Primary Investigator

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Tom Eng, VMD, MPH, is the Founder & CEO of Healia. He is a national expert in eHealth product development, eHealth strategies, and the use of emerging technologies to improve healthcare and public health. He is an Adjunct Clinical Assistant Professor at the University of Washington; a judge for several business plan competitions such as the Global Social Venture Competition; a judge for the Siemens Westinghouse Science, Technology, and Math Competition; a member of the National Advisory Committee of the Health e-Technologies Initiative, and an advisor to several nonprofit and commercial eHealth ventures. Dr. Eng has authored or co-authored more than 100 peer-reviewed articles, books and book chapters, and abstracts on a wide range of health and technology issues. He has worked previously at the US Department of Health and Human Services, the Institute of Medicine, the Centers for Disease Control and Prevention, the Peace Corps, the US Senate, and two state health departments. He is an alumnus of the University of Pennsylvania and Harvard University.

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Research Team & Affiliations

Tom Eng, EvaluMetrix and Holly Jimison, Oregon Health Science University

Total Budget

\$856,698

Research Objectives

Aim 1: Develop a health search engine that enables users to find high quality and individually relevant information

Aim 2: Evaluate whether the health search engine is better accepted among consumers than currently available search engines and whether it produces higher quality results as judged by health professionals.

Theory/Hypothesis

A health vertical search engine can provide higher quality and more relevant results than a general search engine.

Experimental Design

Phase 1: pseudo-randomized design with post-exposure questionnaires

Phase 2: blinded trial

Final Sample Size & Study Demographics

Phase 1: 66 participants, mean age 35.6 yrs \pm 12.5 yrs (range 21-70 yrs); 66.7% female and 33.3% male; White, non-Hispanic (78.8%), African American (10.6%), Asian / Pacific Islander (7.6%), Multiracial (1.5%), Other (1.5%).

Phase 2: Three physicians

Data Collection Methods

Convenience sample of visitors to a healthcare facility and a small group of physicians.

Outcome Measures

In Phase 1: outcome measures included participants' impression of the usefulness of each search engine, its ease-of-use, the relevance of the material returned, and their overall satisfaction with the experience.

In Phase 2: outcome measures included participants' impression of each search result according to relevancy in answering the specific question, accuracy of the information, and trustworthiness of the source.



Evaluation Methods

The features and functionality of Healia were designed based on extensive review and analysis of relevant literature, health information evaluation tools, specialized search engines, focus groups, and health Web sites. The algorithms and methods used were developed and tested based on rapid prototyping techniques.

A usability evaluation of the initial search engine UI was conducted at the National Cancer Institute's Usability Lab in Rockville, MD. The intent was to ensure that the search engine UI was easy to learn and use, useful to the intended audience, and satisfying to use. Several changes to the UI were implemented as a result of this evaluation.

An independent comparative trial of Healia, a general search engine, and another health-specific search engine was conducted at the Oregon Health & Science University. Our goal was to determine whether Healia, which was developed specifically for retrieving quality health information, performed better than the currently available search engines (i.e., Google and MedHunt).

This study had two phases: Phase 1 involved the assessment of the search engines from a consumer satisfaction perspective and Phase 2 evaluated the quality of search results as judged by health professionals.

In Phase 1: 66 participants (non-health professionals) were recruited and asked to use a search engine to find answers to a set of questions covering areas including diabetes, colon cancer, prescription drugs, weight loss, alternative medicine, and smoking. The ordering of the questions and the search engines were pseudo-randomized. Multiple methods of data collection were employed including naturalistic observation of consumers using the search engines along with post-search questionnaires.

In Phase 2: three physicians were asked to score each set of search results from the three search engines in response to nine consumer health questions. The physicians were blinded to the identity of the search engine that produced each search result.

Research Results

In Phase 1: both Google and Healia were rated significantly better than MedHunt in all measures ($p < .005$). The scores with respect to ease-of-use, relevance of results, and overall satisfaction were not significantly different between Google and Healia.

In Phase 2: Every physician rated Healia higher than Google and MedHunt on each dimension of quality. Healia was significantly rated higher in overall quality measures than Google and MedHunt ($p < .005$).

Barriers & Solutions

Brand bias was a major issue in Phase 1. Thus, the Phase 2 blinded trial was conducted.

Product(s) Developed from This Research

Healia® (www.healia.com)