

Designing Evaluation of Web-Based Information Resources: "Televaluation" of Patient Clinical Information Systems

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BACKGROUND

With the increasingly widespread use of the World Wide Web for medical and health applications, the development of methods for evaluating these systems regarding their effectiveness and usability is becoming a critical issue. Designing effective evaluations in medical informatics can be difficult but becomes even more challenging when it involves evaluation from a distance. In this poster, the focus is on development of a framework for designing effective evaluations directed at assessing patients' use of Web-based information systems. Examples will be provided in the context of a system we are currently evaluating, known as PatCIS (Patient's Clinical Information System), developed at Columbia University. This system provides patients with customized views of their own medical records via the World Wide Web. PatCIS allows patients with chronic illnesses, such as diabetes and asthma, to enter their health data and receive advice about management of their illness¹.

OBJECTIVES

Our methodological framework addresses the following: (1) determining the extent to which the patient's view of the system differs from that of the designers and how potential "mismatches" between the two influence system effectiveness (2) going beyond assessment of user satisfaction to consideration of how patient's interaction with the system and human caregivers changes over time, (3) characterizing the impact of such systems on patient reasoning and thought processes, and (4) identifying technical and methodological issues for performing evaluations remotely (i.e. "televaluation").

METHODOLOGY

We employ a number of methods in conjunction, as described below:

1. Questionnaires: Several on-line questionnaires were developed using HTML, so they can be accessed by subjects from their homes via the World Wide Web. The questionnaire scales include the following:

- Patient Demographics: baseline questions about the patient's age, sex, and background.
- Patients' Prior Computer Experience: baseline questions to assess patients' computer literacy.
- Relationship with Health Care Providers: questions about the patients' interaction with health care professionals over time.
- Patient Expectations About System Use: questions to assess patients' subjective expectations about their use of PatCIS over time.

2. Log Files of System Use: Log files capturing information about usage of system features are automatically collected from all patient interactions with the system.

3. Telephone Interviews: Phone interviews are periodically conducted with patients regarding usability issues and life-style issues.

4. Video-Based Usability Testing: A subset of the patient population are asked to interact with the patient information system in performing representative tasks. These sessions are video recorded and analyzed using methods based on usability testing and cognitive analysis.

Individual methods of conducting evaluation in medical informatics alone can provide valuable information. However, in order to gain in-depth understanding underlying use of systems, convergent methodologies are required. Deployment of PatCIS, and commencement of evaluation is currently underway, including data collection using the above methods. As the project proceeds, the data collection methodology will be iteratively refined.

References

1. Cimino JJ, Sengupta S, Clayton PD, Patel VL, Kushniruk AW, Huang X. Architecture for a web-based clinical information system that keeps the design open and the access closed. Proceedings of the 1998 AMIA Annual Fall Symposium.