Evaluating designs against users' requirements in Latin America: an experience of human-centered methods, techniques and tools on a low budget

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Introduction

- ISO 13407 describes human-centered development (HCD) as “An approach to interactive system development that focuses specifically on making systems usable. It is a multi-disciplinary activity, which incorporates human factors and ergonomics knowledge and techniques. Applying ergonomics to the design of systems involves taking account of human capabilities, skills, limitations and needs.”

Introduction (cont.)

- Since 1998 the Hospital Italiano de Buenos Aires (HIBA), a tertiary care, teaching and research hospital, has gradually been implemented a full-scale Health Information System

- Since 2002, the hospital has had physicians in a residency program in medical informatics. During our daily work, we perceive problems with the utilization of the problem management system.

- We began with this part of the system because all interaction with the Electronic Health Record implies the creation of a new problem or the modification of an existing one.

Introduction (cont.)

- The first stage of HCD process is to establish and maintain a focus on stakeholder and user issues.
- To achieve this first stage we conducted a previous study using qualitative techniques based on ethnography.
- This evaluation allowed us to clarify how information is communicated and used, as well as to identify the causes and consequences of inadequate information flows and to meet users' needs, their tasks, expectations and problems with the information resource.
- In the second place we set up a multi-disciplinary team and developed a plan specifying how to solve the problems seen and to improve the overall system development process.
- We are now at stage known as "Evaluate designs against requirements". The purpose of this process is to collect feedback from end users on the developing design.

Objective

- This study was undertaken to measure user interaction satisfaction with the redesigned EHR in routine clinical practice in order to begin to understand which aspects of the system meet the users' requirements and which do not.

Materials and Methods

- We focus on Usability testing, version 7.0 of the paper format of the QUIS was used for the study.
- We used sections from 1 to 8 because sections 9 to 12 were not applicable to the interface[5].
- In addition to the use of the QUIS, one investigator observed and listened to the clinicians during the evaluation of the interface
- The study was carried out in a clinician's office. We used mock patient data to ensure that all items of the problem list administration module were included.

Results

- Five general practitioners agreed to participate, one female and four males, ranging in age from 30 to 44, with a mean age of 38.8.
- Users spend at least 10 hours per day with the EHR for more than 3 years.
- All were familiar with computer hardware, word processor, database software, e-mail and the Internet.

Results (cont.)

Object	Mean	St. Dev.
Overall user reactions	7.5	0.7
Screen Design and layout	7.5	0.8
Terminology and System information	7.6	0.6
Learning	7.2	1.4
System capabilities	7.1	0.8
Online Help	8.2	0.5

Mean user response to each section of the QUIS.

Discussion

- In this evaluation study, the problem list administration module scored high in all areas.
- The highest score was in “Screen design and layout” and in “Terminology” and the lowest in the areas of “Learning” and “System capabilities”.
- Interface satisfaction studies have been conducted successfully because we meet users needs on the EHR redesign.

Discussion

- These findings were not too surprising because most of the clinicians' requirements in the first study were met by a terminology server after they had made some suggestions on user interface, that were taken into account when rebuilding the problem list administration module.

- Based on extensive user feedback, screen designs and quality of terminology had improved significantly.

Conclusion

- People and organizations used to think that usability testing is very costly and complex and that it should be reserved for the big project with a huge budget and a lavish time schedule. Not true.

- The best results come from testing no more than five users and running as many small tests as you can afford.

- This study allowed us to evaluate redesign in the context of users' requirements and to empower users and motivate them.

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