



Scenarios, personas and user stories: User-centered evidence-based design representations of communicable disease investigations



Anne M. Turner^{a,b,*}, Blaine Reeder^c, Judith Ramey^d

^a Department of Health Services, School of Public Health, University of Washington, Box 354809, Seattle, WA 98195, USA

^b Biomedical Informatics and Medical Education, School of Medicine, University of Washington, Box 357240, Seattle, WA 98195, USA

^c Biobehavioral Nursing and Health Systems, School of Nursing, University of Washington, Box 357266, Seattle, WA 98195, USA

^d Human Centered Design & Engineering, College of Engineering, University of Washington, Box 352315, Seattle, WA 98195, USA

ARTICLE INFO

Article history:

Received 20 August 2012

Accepted 11 April 2013

Available online 22 April 2013

Keywords:

Human centered design

Public health informatics

Communicable disease reporting

Information workflow

Personas

ABSTRACT

Purpose: Despite years of effort and millions of dollars spent to create unified electronic communicable disease reporting systems, the goal remains elusive. A major barrier has been a lack of understanding by system designers of communicable disease (CD) work and the public health workers who perform this work. This study reports on the application of user-centered design representations, traditionally used for improving interface design, to translate the complex CD work identified through ethnographic studies to guide designers and developers of CD systems. The purpose of this work is to: (1) better understand public health practitioners and their information workflow with respect to CD monitoring and control at a local health agency, and (2) to develop evidence-based design representations that model this CD work to inform the design of future disease surveillance systems.

Methods: We performed extensive onsite semi-structured interviews, targeted work shadowing and a focus group to characterize local health agency CD workflow. Informed by principles of design ethnography and user-centered design we created persona, scenarios and user stories to accurately represent the user to system designers.

Results: We sought to convey to designers the key findings from ethnographic studies: (1) public health CD work is mobile and episodic, in contrast to current CD reporting systems, which are stationary and fixed, (2) health agency efforts are focused on CD investigation and response rather than reporting and (3) current CD information systems must conform to public health workflow to ensure their usefulness. In an effort to illustrate our findings to designers, we developed three contemporary design-support representations: persona, scenario, and user story.

Conclusions: Through application of user-centered design principles, we were able to create design representations that illustrate complex public health communicable disease workflow and key user characteristics to inform the design of CD information systems for public health.

© 2013 Elsevier Inc. All rights reserved.

1. Introduction

Despite years of effort and millions of dollars spent to create unified electronic communicable disease reporting system, the goal remains elusive. The timely monitoring and control of communicable infectious diseases is critical to maintaining the health of communities and is a primary activity of local health agencies (LHA) [1]. Post 9/11, the application of information technology (IT) to support disease monitoring efforts at public health agencies has been a high priority [2]. However, efforts to implement com-

municable disease (CD) information systems into public health practice have been slow, with costly mistakes [3]. Independent implementations of in-house and commercial-off-the-shelf technology have resulted in great variability in purpose, function and capacity of these CD information systems [4,5]. As a result, effective and efficient surveillance systems that support CD work remain a goal of the future.

Research into the factors that influence the adoption of IT in clinical healthcare suggests that adoption is hindered by economic barriers, contextual barriers, lack of training, user resistance, policy constraints, and legal constraints [6–9]. System design and usability are important to the adoption of health IT. A systematic review of usability methods used in health informatics found that the majority of studies failed to report an explicit qualitative design approach, focused only on a single aspect of the work environment, and rarely used task and/or workflow analysis to contextualize the

* Corresponding author at: Department of Health Services, School of Public Health, Box 354809, University of Washington, Seattle, WA 98195, USA. Fax: +1 206 616 9415.

E-mail addresses: amturner@uw.edu (A.M. Turner), breeder@uw.edu (B. Reeder), jramey@uw.edu (J. Ramey).

fit of users, tasks, systems and work environments in the early stages of design [10]. To reduce barriers introduced at the early stages of system design, design approaches that address these oversights are necessary.

Over the last several years, we have seen increased efforts to improve interoperability and electronic data exchange between public health agencies and clinical systems [11]. However, budget cuts and resource constraints [12] have limited the ability of staff to dedicate time to provide input into the design of information systems used in their work. Despite recent state-level improvements in disease surveillance capacity enabled by information systems, tools and representations to assist system designers in understanding CD work at the local level are needed.

Recent research that characterized barriers to the work of disease surveillance recommended further study of public health information work and inclusion of public health practitioners in the early stages of system design [13]. User-centered design has been used to explore interface design for public health services during emergencies [14], to develop tools that visualize simulated outbreaks for disease detection and control training [15] and to create research tools for data mining and visualizations of health data [16]. However, these studies focused primarily on applying user-centered design for improving functionality of interphase design of an existing system. They do not address the need for a more complete understanding of disease surveillance case investigation workflow nor do they demonstrate how user-centered design methodology can be used to produce verified design artifacts that illustrate to designers the users, tasks and context of public health work early in the system design process. Therefore, this study was conducted to fill the gap in knowledge regarding CD investigation and reporting information workflow and apply user-centered design to inform system designers about users of CD systems.

1.1. Aims of the study

To address this problem our study had two aims:

- (1) Describe the work processes, influences and environment of CD monitoring and control at an LHA.
- (2) Based on the data produced by the first goal, develop both traditional and novel evidence-based design representations that model CD monitoring and control as references for system designers to inform design of future disease surveillance systems.

To achieve our first aim, we conducted a workplace ethnographic study to produce *workflow diagrams* and *descriptions of themes* that influence work. To achieve our second aim we employed methods of design ethnography and user-centered design to produce *personas*, *scenarios of use* and *user stories* to convey key findings based on the workflow analysis. We describe here the initial ethnographic studies of CD information workflow at a Washington State LHA and the application of user-centered design as a novel way to represent these findings to designers.

1.2. Workflow and design

The *workflow diagram* is a common representation from traditional task analysis [17–19] that schematically presents structures and relationships of work tasks in a flowchart. Workflow studies can include people [20], groups [21,22], context of work [23], and human values and beliefs [24]. The use of ethnographic methods and thematic analysis can complement workflow diagrams with *descriptions of themes* of work [23]. *Design ethnography* is a research

practice that draws on traditional ethnography and focuses on common patterns that are important to the design of information systems [25]. A form of action research, design ethnography focuses closely on discovering opportunities for design interventions in the situation under study. To make research findings as vivid as possible to designers, user-centered design offers alternative forms of representation for user and workflow data. Three common representations of user/task data in forms that are useful to designers are *personas* [14,26], *scenarios* [14,27–29], and, more recently, *user stories* [30,31] (see Table 1 for definitions). These representations have been used primarily to describe user behavior for improving Internet interface design. These representations have not heretofore been used in public health informatics research to represent users and complex workflow to designers early in the process of developing CD systems.

2. Methods

In this section we discuss the study setting, participants, data collection, and data analysis.

2.1. Setting

Kitsap County Health District (KCHD) is one of 35 LHAs in the state of Washington. It is located in Bremerton, Washington on the Kitsap Peninsula in the western part of Washington State. Kitsap County has a population of approximately 250,000 and is characterized by a mixture of urban and rural areas, with a large naval population and two Northwest Indian tribes. KCHD has 124 FTE and is classified as a medium-sized LHA (size classification is defined in terms of population served; medium = 50,000–499,999 [32]). KCHD provides the following major community services: parent-child health services; clinical services; communicable disease and HIV/AIDS services; environmental health services; health promotion and health education programs; and community assessment. At the time of primary data collection, KCHD had recently adopted a new statewide information system to support CD activities.

2.2. Participants

Eleven participants were recruited from LHA personnel based on their job roles in CD programs, including the Sexually Transmitted Disease (STD) Program, the HIV/AIDS program, and Environmental Health. Participants provided data through a variety of methods including initial informant interviews, semi-structured interviews, selected work shadow observations, and a focus group. Table 2 shows participants by job role and the data collection methods with which they were engaged.

2.3. Data collection

A mixed methods approach to data collection was used in order to triangulate our understanding of CD activities at the LHA. Interview data were collected over a 3-month period in the autumn of 2006. Selected work shadow observations and a focus group were used to triangulate and validate our interview findings. Principle members of the research team have maintained a relationship with participants at the study setting since that time. All study instruments and protocols were approved by the Institutional Review Board (IRB) of the University of Washington. Informed consent was obtained from all participants prior to conducting interviews, observations and the focus group.

Download English Version:

<https://daneshyari.com/en/article/10355478>

Download Persian Version:

<https://daneshyari.com/article/10355478>

[Daneshyari.com](https://daneshyari.com)