



Eliciting end-user expectations to guide the implementation process of a new electronic health record: A case study using concept mapping



Erik Joukes^{a,*}, Ronald Cornet^{a,b}, Martine C. de Bruijne^c, Nicolette F. de Keizer^a

^a Department of Medical Informatics, Academic Medical Center, University of Amsterdam, P.O. Box 22700, 1100 DE Amsterdam, The Netherlands

^b Department of Biomedical Engineering, Linköping University, SE-581 83 Linköping, Sweden

^c Department of Public and Occupational Health, EMGO Institute for Health and Care Research, VU University Medical Center, Van der Boechorststraat 7, 1081 BT Amsterdam, The Netherlands

ARTICLE INFO

Article history:

Received 29 June 2015

Received in revised form

18 December 2015

Accepted 19 December 2015

Keywords:

Concept mapping

Electronic health record

Implementation

Healthcare professional

Expectation

ABSTRACT

Objective: To evaluate the usability of concept mapping to elicit the expectations of healthcare professionals regarding the implementation of a new electronic health record (EHR). These expectations need to be taken into account during the implementation process to maximize the chance of success of the EHR.

Setting: Two university hospitals in Amsterdam, The Netherlands, in the preparation phase of jointly implementing a new EHR. During this study the hospitals had different methods of documenting patient information (legacy EHR vs. paper-based records).

Method: Concept mapping was used to determine and classify the expectations of healthcare professionals regarding the implementation of a new EHR. A multidisciplinary group of 46 healthcare professionals from both university hospitals participated in this study. Expectations were elicited in focus groups, their relevance and feasibility were assessed through a web-questionnaire. Nonmetric multidimensional scaling and clustering methods were used to identify clusters of expectations.

Results: We found nine clusters of expectations, each covering an important topic to enable the healthcare professionals to work properly with the new EHR once implemented: usability, data use and reuse, facility conditions, data registration, support, training, internal communication, patients, and collaboration. Average importance and feasibility of each of the clusters was high.

Conclusion: Concept mapping is an effective method to find topics that, according to healthcare professionals, are important to consider during the implementation of a new EHR. The method helps to combine the input of a large group of stakeholders at limited efforts.

© 2016 Elsevier Ireland Ltd. All rights reserved.

1. Introduction

Electronic health records (EHRs) store medical information of the patient and provide functionalities such as computerised physician order entry and decision support that assist physicians in providing care of good quality. Earlier studies showed that implementing a new EHR can result in both improved [1,2] as well as decreased quality of care [3].

The implementation of a new EHR is not merely a technical project, but rather a socio-technical project involving the EHR itself, the end-users, and the organisation [4]. The end-users and the

working processes of the organisation have to be taken into account thoroughly to maximize the chance of success during this change process [5]. To realize full user adoption end-user involvement, and monitoring and managing of end-user expectations is critical [6]. Therefore it is advisable to elicit the expectations of users in the local situation before the start of an actual implementation. Based on the outcomes the hospital can plan interventions which improve involvement and support of end-users during the implementation. Having positive and realistic expectations from the start of the implementation process can help to reach high acceptance of the new EHR in later phases.

Future end-users of an EHR all have their own expectations of the new EHR. There is a distinction between expectations on EHR functions and on implementation processes. Functional expectations concern the requirements for the system itself and its functions (e.g. “I need a warning when I make a mistake”). Process expectations concern the implementation process and the way the

* Corresponding author.

E-mail addresses: e.joukes@amc.uva.nl (E. Joukes), r.cornet@amc.uva.nl (R. Cornet), mc.debruijne@vumc.nl (M.C. de Bruijne), n.f.keizer@amc.uva.nl (N.F. de Keizer).

system is embedded in the organisation (e.g. “I need training”, or “I need to change my work processes”). In this study we focused on the process expectations before implementing a new EHR which can be seen independently from any specific EHR.

Two reviews [7,8] have described barriers and facilitators that influence an EHR implementation according to the users. One of these [7] focused on physicians only, the other [8] included more types of end-users. Both reviews included qualitative studies, using mainly interviews, and quantitative studies, using primarily surveys and questionnaires. Gathering detailed information by performing, transcribing, and summarising interviews from a large group is time consuming. Using questionnaires, a larger group of participants can be reached, but the questions are determined in advance and they offer less possibilities to delve into context-dependent details. Concept mapping is a method to determine and classify the expectations of a large diverse group of end-users that could overcome these limitations [9].

Concept mapping is a structured group conceptualisation method, resulting in a map of clusters containing statements concerning a specific theme. This method is a combination of qualitative and quantitative research. Performing focus groups with end-users results in a qualitative description of their opinions. Combining these results using statistical clustering methods leads to a quantitative summary of the general opinion of the group of users. Concept mapping has been used in the healthcare domain before, e.g. to design an indicator framework for addiction treatment centres [10], health planning and evaluation [11], and developing conceptual frameworks for complex constructs such as anxiety [12].

Two university hospitals in Amsterdam, The Netherlands, are in the process of jointly implementing a new EHR. We investigated the expectations of their personnel regarding the first phase of the implementation (before go-live) using concept mapping. The goal of this research was to evaluate the suitability of the concept mapping method to determine, from the end-user perspective, topics that enable working successfully with the EHR as soon as it is implemented.

2. Methods

This study was performed in the Academic Medical Center (AMC) and the VU University Medical Center (VUmc), both university hospitals located in Amsterdam, The Netherlands. Both hospitals have approximately 7000 staff members each working in patient care, research, and education. The AMC has 1003 beds and the departments work with either a set of computer programs, together forming the EHR, or a paper-based record, or a combination of both options. The VUmc has 733 beds and works predominantly with paper-based records, combined with computerized systems to view information from laboratories and radiology.

The implementation of the new EHR in the two hospitals was organised through a shared multidisciplinary team of medical and information management specialists. This team included a working group to measure the effects of the implementation on the personnel. Our research was performed in close collaboration with this working group.

For our concept mapping process we used the method of Kane and Trochim [9]. The method consists of 6 steps; preparation, generating ideas, structuring statements, concept mapping analysis, interpretation of results, and utilization of the results. The method and process are described in Ref. [13]. Concept mapping has several characteristics that can be relevant in healthcare [14]. The method takes advantage of multidisciplinary sessions. In the healthcare sector this is most likely a team of participants representing multiple

roles and multiple medical fields. Using a diverse group of people in the discussion session enables people to interact with others' views on the subject. Additionally, the results of the concept mapping method are maps that can be interpreted by people who are not familiar with the method. This ensures proper diffusion of the results in the organisation.

2.1. Step 1: prepare for concept mapping

In this particular study we investigated the process expectations of the employees of the university hospitals in the pre-implementation phase of an EHR. The focus statement “To enable me to work properly with the new EHR once implemented, in the early stages of implementation I need . . .” was used to start the discussion among the participants. We explicitly aimed to exclude statements concerning system's functionalities (e.g. “I need medication order sets to support my medication prescription”) as functional requirement analyses were already performed. To exclude functionalities we added to the focus statement that the discussion should be limited to changes in work processes and the process of implementation.

The EHR implementation team contacted employees with information management or medical roles, who were already involved in the preparation of the EHR implementation. These contacts were asked to suggest possible participants to the concept mapping sessions. Some of these participants were already involved in the preparation of the EHR implementation, others have not had any role in the implementation before.

Concept mapping works best when the group is heterogeneous [9] (pp. 35–6). Therefore we strived to include personnel of both hospitals, of multiple departments, in all roles that will be using the new EHR (nurses, physicians, supporting professionals), and who are both involved and not involved in the implementation. In total four sessions were organised with 8, 16, 9, and 13 participants.

2.2. Step 2: generating the ideas

After signing an informed consent form and being presented with the goal, rules and scope of the focus session, the participants were given approximately ten minutes to individually write down statements in accordance with the focus statement.

Subsequently, the chairman of the group session asked every participant to present one statement of their list. The chairman extracted the main point of each statement and checked with the participant whether this summary was correct. Each statement that contained more than one subject was split into single statements after consulting the participant. When the statement was clear to all participants it was typed into a computer and presented to the participants using a projector. The participant could thus directly check the transcription of the statement. During the discussion we excluded statements that were of a functional nature (e.g. “I need a large button to go to medication”). However, we have tried to identify the underlying issue in the employees work processes (e.g. “I need a good overview of the current medication”).

After the statement was written down the next participant was asked to provide the first item on his/her list and the process was repeated. All participants were asked to keep their own list up to date by removing items that were already mentioned by other participants. After one round of statement gathering the process started again until none of the participants could add a new statement.

2.3. Step 3: structuring the statements

After the focus group sessions were completed, the statements were combined into one general statement list. Duplicates were

Download English Version:

<https://daneshyari.com/en/article/516711>

Download Persian Version:

<https://daneshyari.com/article/516711>

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