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# User participation in healthcare IT development: A developers' viewpoint in Finland

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## ABSTRACT

**Background and purpose:** Recent research showed that physicians in Finland were highly critical of their information technology (IT) systems. They were also critical of the methods of collaboration with the developers of the health IT systems (HITS) in use at the time of the questionnaire. This study turned the set-up around and asked systems developers the same questions about collaboration. What is developers' view on end user participation in HITS development at the moment? How would developers wish end users to participate in systems development? Do the developers' views differ from the physicians' (end users') views of the current state of collaboration in developing IT systems?

**Methods:** A web-based questionnaire study was conducted in one of the major HITS provider companies in Finland among all developers, including software developers and customer support and sales personnel. Both quantitative and free-text questions of a previous study were adapted for the purpose. The responses were analyzed with qualitative and basic quantitative methods.

**Results:** The response rate of the questionnaire was 37% and 136 responses were received. The developers who responded were experienced workers; 81% of the respondents had 6 years or more of work experience in IT systems development and 35% of them had 6 years or more of work experience in the healthcare domain. Almost three-quarters (72%) of the respondents agreed with the statement 'I work with users'. Almost all the developers (90%) thought that they are interested in user feedback and also 81% thought that they take the end users' opinions and experiences into account when developing software. A majority of the developers (57%) considered that corrections and modifications are currently not implemented quickly enough. The most popular means of user participation were that 'users would present their work and needs related to it in their workplace' (76%), followed by user groups (75%). The developers suggested many traditional user-centered and usability design methods, too.

The developers' views were compared to the views of the physicians who primarily used the case company's products. The views were in direct opposition on whether developers are interested in end users' views (90% of the developers agreed, vs. 60% of the physicians disagreed) and take them into account (81% of the developers agreed, vs. 63% of the physicians disagreed), as well as on user groups (favored by 75% of the developers vs. 14% of the physicians). The majority of the respondents, both developers (57%) and physicians (74%), were dissatisfied with the pace of implementation of corrections and modifications.

**Conclusions:** Both physicians and developers seem to be "willing but not able" to collaborate with each other. Possible reasons for the differences in views include the fact that there is no

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return channel of communication on what happened to the end users' feedback, and that developers collaborate with customer representatives who are not end users. It is obvious that there are one or more spots along the route between the "end developers" and end users where there is a breakdown of the information flow.

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## 1. Introduction

### 1.1. Background to the study

A recent large questionnaire study among all Finnish physicians showed that they are highly critical of the information technology (IT) systems that they have to use [1,2]. A sub-study [3] showed that they are also highly dissatisfied with the means and methods of participation in the development of healthcare IT systems (HITS). Physicians are interested and willing to participate in system development but they feel that they are not able to participate properly. In their opinion, the end user point of view is missing in HITS development, developers lack knowledge of the substance of healthcare, and too few experienced clinical physicians are involved in the development. They also thought that HITS have been developed entirely by engineers and those medical doctors who are working in administrative positions. In physicians' opinion, healthcare organizations should give more opportunities for physicians to participate in the development of their IT systems. Physicians also think that developers should be more interested in end users' visions and needs, and visit the workplaces of healthcare workers [3].

The physicians' opinions on the current state and methods of participation in HITS development were thus quite negative. It would be interesting to know the other side of the coin – what kind of views *systems developers* have about HITS development and end user participation. Knowing developers' views could make it easier to achieve better means and methods for end user-developer cooperation in HITS development. While there are numerous studies on end user participation and its benefits, studies on the same issue from the developers' perspective are quite difficult to find, especially in the healthcare domain. A Swedish study on computer consultants' experiences and views of different forms of user participation found that user testing was the most common form of user participation [4].

In this paper we study HITS developers' opinions on, and experiences of, end user participation and the methods used in system development. The issues were studied with a questionnaire which was conducted in the healthcare unit of a large software company in Finland. The target population of the questionnaire study mainly consisted of product developers and customer support personnel.

### 1.2. Definitions of key terms

In this paper we regard an *information system* as "the processes of managing (creating, using, storing, exchanging, etc.) information in an organizational setting (in work activities) for a purpose" – a socio-technical entity in the user organization consisting of people (actors), information (contents), and

technology (means), linked together by a process directed toward a purpose [5]. Correspondingly, *information systems development* is the activity through which such socio-technical entities are introduced to or modified in user organizations.

In this view, an *IT system* is the core technological artifact used in information systems, and a *healthcare IT system (HITS)* is such an artifact used in healthcare organizations (hospitals and clinics). Although an IT system includes hardware (end user workstations, networks, servers, etc.), the dominant part of it from the end user's viewpoint is the *software system* (also called, e.g., software package, application software, software product). We use the term *software product* to refer specifically to those software systems which are produced in an industrial way and packaged as products. *Software product development* is then the nexus of activities that are needed to design, implement, test, modify, and distribute software products.

Software product development for healthcare takes place mainly in companies ("software houses") which we call *HITS providers*. Taking their viewpoint in this paper, *customer* refers to a healthcare organization using the software product, and *end users* are the people in the customer organization who are directly using the product (doctors, nurses, etc.).

We selected the term *HITS development* to jointly refer to healthcare software product development by HITS providers and those parts of socio-technical information systems development in healthcare organizations that deal with the software product.

In this study, the term *developers* is used as a general term referring to employees of an HITS provider company. Developers are divided into two broad categories. We call people who are working in a product development department *software developers*. We call people working on a help desk or in customer support activities *customer support*.

For user-centered design (UCD) we use the definition of the User Experience Professionals Association: "User-centered design (UCD) is an approach to design that grounds the process in information about the people who will use the product. UCD processes focus on users through the planning, design and development of a product." [6]

### 1.3. Related research

It is common knowledge that the success rate of IT projects is not very high. It has been argued that only 34% of IT projects are successful [7]. Understanding the use and the use context is the key issue in the success of technology projects. When hundreds of successful and unsuccessful technology projects were compared, the main differences were in the understanding of users' needs and the quality of communication in the project. It has been claimed that the weakest part of software product development is the understanding of how end users use the IT system. In fact, it has been argued that end user

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