



Physicians' experiences of participation in healthcare IT development in Finland: Willing but not able

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ABSTRACT

Objective: To learn (1) about the kind of experiences that physicians have with participation in healthcare IT development; (2) whether physicians are interested in participating in IT development activities, and if so, how; and (3) the visions that physicians have regarding future IT systems.

Methods: A web-based questionnaire which was answered by about one-third of the working-age physicians in Finland, which is exceptionally broad and sizeable a sample. This research deals with only a small part of the entire questionnaire. The questions used for this study were both quantitative and qualitative. Statistical methods were applied to the former and content analysis to the latter.

Results: The responding physicians were highly critical of their IT systems, and their experiences with the current methods of participation, or rather the lack of it, were quite negative. However, a very significant proportion of the respondents were willing to contribute to IT systems development, contrary to a common assumption that clinicians are disinterested. Visioning of future systems was quite cautious, dealing mainly with usability improvements to the current systems.

Conclusions: Major improvements are needed both in the usability of the systems currently in use in Finland and in the collaboration between end-users and developers. Improved methods of participation need to be developed and applied, particularly for the procurement, deployment and on-going development of commercial-off-the-shelf applications.

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1. Introduction

1.1. The need for end-user participation in healthcare IT development

A large body of research supports the argument that healthcare information technology (IT) development should involve

end-users, i.e. healthcare professionals as the primary users of these systems.

Firstly, clinicians seem to have a critical attitude towards the adoption and usefulness of healthcare information systems. Studies have indicated that the most significant barriers in electronic health record (EHR) system adoption and use are concerns about the amount of time it takes to use the system [1–3]. Following this, questionnaire studies about

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system adoption and user satisfaction have shown worrisome findings. A recent survey of over 10,000 respondents from medical offices in the USA pointed out serious challenges to the appropriate use of patient charts (medical records): 86% of respondents agreed that an incorrect chart had been used for a patient during the past 12 months; 63% indicated that a patient's chart was not available when needed; and 44% stated that a patient's medication list was not updated during the visit [4]. Further, a cross-sectional survey with primary care physicians, which was conducted in seven countries, found significant satisfaction differences with the overall experience of practicing medicine at the information system level [5]. Similar findings have been reported in Finland, where information and communication technologies are widely used in healthcare. Recently, several critical articles have been published in national medical journals [6–10] and the recently published results of a national usability survey indicated that physicians assess their EHR systems very critically [11,12].

Secondly, several researchers have emphasized the need for understanding contextual aspects behind system design and involving end-users in development activities. One may argue that clinical work and processes have characteristics that are typical to the healthcare delivery domain only, and therefore, are crucial for consideration in healthcare IT development: a high degree of communication and collaboration among professionals [13,14], diverse and dynamic working practices [15,16], and governmental and professionals regulations [17]. According to Nykänen and Karimaa, the starting point for development should be to obtain an insight into the healthcare work practices where the information systems are to be used [18]. Toivonen et al. argue that work processes and IT systems should be developed simultaneously [19]. Johnson et al. contend that significant attention should be paid to user-centred design guidelines during healthcare information system development in order to avoid the dissatisfaction and abandonment currently experienced [20]. This argument has been supported by recent empirical study findings that indicate widespread EHR adoption and integrated use among those systems that have been developed in accordance with the principles of user-centred design [21]. Further, Zhang has expressed his concern and experiences with the current state of user considerations in healthcare technology development as follows: "In healthcare the culture is still to train people to adapt to poorly designed technology, rather than to design technology to fit people's characteristics" [22]. This claim has been supported by Bleich and Slack and De Rouck et al., who argue that physicians will become enthusiastic IT users if they find the systems useful and helpful [23]; however, at present healthcare professionals still seem to be lagging behind in participation in IT development [24].

Thirdly, there has been a growing interest towards user-oriented development methods in the field of health informatics research in the twenty-first century. Discussions about user involvement have been dominated by the evaluation approach [25,26], since a number of usability evaluation studies have been published of systems already in use or in trial or prototype stages. Moreover, a structured literature review has indicated usability tests, interviews and questionnaires being the most commonly used methods for user involvement in the healthcare technology lifecycle [27]. How-

ever, in recent years a participatory approach has gained interest in design, too. Among other researchers, Clemensen et al. have proposed that participatory design holds the potential as a research approach that might effectively merge computer technology and health-related interventional research [28]. Also, Pilemalm and Timpka have argued strongly on behalf of participatory assessment, and suggested the use of a participatory design-based method, action design, in the design of a large-scale healthcare information system [29].

User-oriented studies of healthcare IT development typically address issues other than end-users' experiences and opinions of IT development. For example, established usability questionnaires (e.g. Software Usability Measurement Inventory, SUMI [30] and System Usability Scale, SUS [31] questionnaires) focus on human-computer interaction, rather than on user experiences, user support, or IT development and design activities. Additionally, user-oriented research and participatory assessment studies seem to be characterized by short-period projects with an emphasis on summative results. These studies often lack a uniform way to describe how study results contributed to the system's iterative development cycle. Therefore, it remains unclear how the research findings and related development work appear from the end-users' viewpoint. In this article we report results from a national questionnaire study, which aimed at researching clinical physicians' experiences of participation in healthcare system development and their visions of clinical IT tools in the future.

1.2. Healthcare delivery in Finland as a particular context for healthcare IT development

This research reports on a study conducted in Finland. Some particular aspects of healthcare in Finland are thus pertinent to the analysis of the results. The local level of elected government, the municipalities, have by law the primary responsibility of arranging social and healthcare services for the people living in their areas. There were 440 municipalities in 2005 for a population of 5.2 million. Preventive and primary care is organized among 251 health centres operated by individual municipalities or a few municipalities in collaboration, while specialised care, ranging from regional hospitals to central hospitals up to the five university hospitals, is provided by 20 federations of municipalities called hospital districts. The national government has a guiding role only. Public health services are mainly financed from municipal taxes, about 20% of the costs being covered from national taxes. Private healthcare (private clinics and hospitals) covers 31% of all outpatient visits nationally and 65% of specialist visits [32]; it is mainly comprised of specialised out-patient care (clinics with speciality areas such as occupational health, general practice, psychiatry, and gynaecology), which is available mostly in the larger cities. For this, we use a concept "private providers (PP)" [33].

Patient information systems including EHR systems were introduced in the early 1980s. Currently EHR systems are used comprehensively on all levels of healthcare [34,35]. The bottom-up structure of the healthcare system means that each health centre and hospital district has decided independently on which IT systems to procure. All systems are locally

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