On the Need for Interdisciplinary Teams in Health IT Design

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Abstract—**Health Information Technology is recognized as a solution to manage health care and improve the quality of care. However, literature reports on unsuccessful implementation projects, challenges and unforeseen consequences of IT in health care. In order to define health IT system requirements, a methodology to comprehensively model health care processes is described. It is concluded that the design of health IT systems should not be done by software engineers or technical personnel in an isolated manner. It is argued for the necessity to engage with the health care sector as an empirical field, and the need for interdisciplinary teams, to tackle the idiosyncrasies of health care processes. The suggested methodology is a useful approach for supporting the definition of the IT requirements, aiming a successful implementation.**

Keywords- Methodology; Interdisciplinary Studies; Health Information Systems; Workflow; Physicians; Nurses; Secretaries.

I. INTRODUCTION

Many studies have identified inefficiencies in the current health care systems. Health Information Technology (IT) is often presented as a solution to such inefficiencies, as it supports health care management and improves the quality of care. However, health IT has only proven its full potential and benefits in specific fields [1]. The aim of the work presented herein is to describe a methodology to comprehensively model health care processes in order to define health IT system requirements. The elective surgery cancellation problem, in a University Hospital in North Norway, is used as a case study to describe the methodology and the gains that come from its application in health IT design.

In order to reduce elective surgery cancellations due to lack of information, at the University Hospital of North Norway (UNN), the eTeam-Surgery project was established. eTeam is approaching the pre-operative planning process to determine if it can be moved from the hospital to the patient at home, through electronic collaboration.

To develop a tool for electronic collaboration between the patient and the hospital is not an easy, nor a straightforward task. Literature surveys report on unsuccessful implementation projects, challenges and unforeseen consequences of IT in health care [2-12]. A contributing factor for the slow diffusion of health IT may be found on its focus on improving individual tasks, rather than supporting value added care processes.

The aim of the work presented is to describe a method on how to comprehensively model care processes to establish a basis to define health IT requirements. It is argued the necessity for health IT designers to understand the complexity of care processes, and their dynamic relation with the environment in which it takes place. Given the idiosyncrasy of care processes, it is recognized that an interdisciplinary team is essential.

This report is divided in four sections. In the first section, the health IT limitations are introduced and the aim of the study is described. In the second section, a brief introduction to the challenges in Health IT implementation are presented. The methodology to model health care processes is described and explained in the third section. The last section elaborates on the need for interdisciplinary teams to understand care processes, in order to achieve successful health IT implementations.

II. BACKGROUND

The patients within the Norwegian population are well prepared and able to use IT [13-15], and health care workers use personal electronic devices to support their clinical work [9, 16, 17]. Hence, there is a substantial evidence in the field of health IT, on unsuccessful implementation projects [2-4]. IT implementation challenges, slow diffusion, and unforeseen consequences in health care, have been described [2-12].

There is vast amount of literature on how to design IT systems that address the problem of unsuccessful IT implementations. A cause may be found in the inadequate design of IT. Several techniques for IT design are used as a tool to approach this issue, e.g., goal-oriented requirements engineering (GORE) [18], user-centered and participatory design [19], and others. However, within this report, the focus is on how to model a care process, in all its aspects (i.e., patient flow, workflow and information flow), so its complexity can be understood, and described in health IT design. It is argued that, when applied to healthcare, this task requires a different methodology that uses an interdisciplinary approach.

III. METHODS AND RESULTS

The methodology is described below; for further information refer to [20].

Stage 1 Gathering data on the hospital's representation of the problem;

Stage 2 Observations and semi-structured interviews at the hospital, related to the processes at the departments;

Stage 3 Individual, in-depth interviews with all professional groups involved in the process at a specific department.

In Stage 1, the aim was to gather knowledge on how the problem is represented by the field itself. The hospital understanding of the elective surgical cancellation problem and the hospital's representation of the pre-operative planning process was approached.

In Stage 2, the aim was to model the process at different departments at the hospital. This comprised three weeks of fieldwork at UNN, conducting observations and thirteen interviews with physicians, nurses and administrative personnel. The main finding from this stage, was internal variation between the different departments in who plans the surgery and how, and when it was done.

In Stage 3, one department was chosen to proceed with an in-depth study based on the knowledge gained in the two first stages. This department was described to be more efficient but still evidenced a representative number of cancellations. The aim at this stage was to comprehensively model the process at this department. We interviewed representatives from the different health professions (e.g., physicians', nurses and secretaries) involved in the preoperative planning, at this specific department. The interviews were semi-structured, on the pre-operative planning process at the department, lasted between one to two hours, and were done at the workplace. This enabled the identification of decision activities, and the health worker responsible for each of them. In addition, knowledge on the information flow was gathered, and the underlying process issues were identified. The main finding was heterogeneity in how departments and individual professionals carry out the pre-operative planning process

IV. DISCUSSION AND CONCLUSIONS

The described three-stage methodology permitted the modelling of the information flow and the workflow, and to describe the complexity of the process.

For the eTeam-Surgery project, the models will facilitate the development of a standard preoperative planning process, as future work. It is our understanding that in order to move the pre-operative planning from the hospital to the patient at home, through electronic collaboration, the preoperative planning process at UNN needs to be re-engineered, in order to resolve the identified bottlenecks, targeting the process standardisation. This is a sensitive job that has impact on the whole organization. The knowledge gathered while applying the described methodology will enable a sensitive analysis, and the integration of the health care workers empirical and/or personal knowledge into IT.

It is concluded that the design of health IT systems should not be done by software engineers or technical personnel in an isolated manner. It is necessary to engage with the health care sector as an empirical field, and an interdisciplinary team is required to tackle the idiosyncrasies of health care processes. The suggested methodology is a useful approach for supporting the definition of the IT requirements, aiming a successful implementation.

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