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Using video observation to gain insight into complex clinical work practices

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Abstract. Experience shows that the precondition for development of successful health-information-technologies (HIT) is a thorough insight into clinical work practices. In contemporary clinical work practices, clinical work and health information technology are closely integrated. Research within Virtual Centre for Health Informatics at Aalborg University, Denmark have during recent years focused on video observation to supplementing traditional ethnographical research methods in providing insight into complex clinical work practices. The objective of this paper is to argue for the potentials of the video observation method to inform and to improve HIT development compared to traditional ethnographic methods. Based on several studies conducted within the healthcare sector, we find, that the video observation method is superior to other ethnographical research methods when it comes to rapidly disclosing the complexity in clinical sociomaterial work practices. We also find that the video techniques used in the healthcare context allows us to revisit the field of observation through the data, to broaden our initial focus and to share data with both the clinical staff involved and other researchers. Hence, it provides us a more in depth insight in the complex clinical sociomaterial work practices than when observing by the use of pen and paper.

Keywords. Health information technology, Video observation method, Visual ethnography, Work Practice, Sociomateriality

1. Introduction

Research within V-CHI (Virtual Centre for Health Informatics) at the Department of Development and Planning at Aalborg University, Denmark shows that in contemporary clinical work practices, clinical work and information technology are closely integrated. Therefore, they should, when studied, be viewed as mutually dependent and not as discrete entities [1-5). Orlikowski and Suchmann support this view and have introduced the concept of "Sociomateriality", which has the notion that there is an inherent inseparability between people and technology in organizational work [6,7). Additionally, clinical sociomaterial work practices involve specialised examination and treatment, specialized health professions as well as use of knowledge of a tacit nature [8,9). This stipulates specific demands when the work practices are studied.

It is a great challenge to capture the complexity and the tacit work practices using traditional ethnographical research methods as, e.g. personal observation, question-

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naires, and interviews, which for decades have been the most applied research methods, because these practices are difficult to pass on to others in words or in writing. Realizing this dilemma, researchers in social sciences already more than three decades ago introduced video observation as a method capable of providing insight into sociomaterial work [10). Since then, the use of video observation has become still more widespread within disciplines of social anthropology (visual anthropology) and sociology to study people's behaviour and their social interactions in a number of different contexts [11-13).

In design and development of e-Health technologies, the potentials of video observation are to generate insight into complex interactions between people and technology in a reusable form. Recent studies in e-Health success and failures stresses the need for more research into the development of new research methods and techniques for achieving a better understanding of the complex clinical work practices, and hence to design and develop sustainable e-Health technologies [14,15). Today most studies of clinical sociomaterial work practices are performed by traditional ethnographical methods. Different types of interviews provide a good insight into "what the health care professionals *think* they do" as well as "what they *say* they do", whereas personal observation methods, where the observer note down what he or she captures by the eyes and ears, is used to get closer to an understanding of "what health care professionals *actually* do" when they perform their work in real time and place. This may turn out problematic when doing explorative studies in very complex settings and in unknown terrain.

Researchers within V-CHI have during recent years focused on the development of new methods and techniques capable of getting closer to understand the very complex and interdisciplinary work practice of health care professionals. When work practices become routine, they slip to the background of the conscious awareness and may be difficult to recognise without having the context to support recall. [16). Here video observation turns out to be a valuable tool. With a participatory view to user involvement, we have conducted several studies within the healthcare sector in real work, time and place. Through those studies we have found that video observation of health care professionals, performing their daily tasks provide a thorough insight into the clinical sociomaterial work practices - including parts of the tacit work practices [1-5). It is our experience that video observation within the healthcare sector, allow us to obtain a *rapid* valuable insight into the clinical work practise. The objective of this paper is to argue for the potentials of the video observation method to inform and to improve HIT development compared to traditional ethnographic methods.

2. Methods

The views, knowledge and experiences presented in this paper are based on a hermeneutical point of view on clinical sociomaterial work practices. In the specific context of the healthcare sector, this means that we use video observation to understand and to interpret "how health care professionals and e-Health technologies interact", when they perform their daily clinical work in their normal working. One of the factors characterising the hermeneutical, ethnographical approach is that the relevant actors have to be identified, in order to interpret their opinions on the process and on the results. Our participatory approach to user involvement in studies of the sociomaterial interactions between humans and technology is fully in line with this [1,2,4,17).

It is important to stress that we do not consider the video technique itself a research *method*. It is a technique, which can be used to collect rich and reusable data within the ethnographical observation method. In contrast to data generated by personal observation, data generated by video observation are rich as it is both visual and audial [18]. The video observation technique becomes a video observation method, when the data collected are analysed by the researcher, the health care professionals, system developers and other relevant stakeholders.

The results presented in this paper are based on a number of case studies conducted by V-CHI researchers 2004-2011 using audio-visual video observation methods for data collection within different healthcare settings [1-5,19]. Prior to data collection, we have obtained the necessary formal approvals from the authorities. Besides, out of informal ethical considerations, we have avoided getting the patients into the picture and obtained acceptance from the health care professionals.

3. Results

During our research we have gained thorough experiences on where, when and how to use video observation. Our experiences show that video observation is beneficial in studies with the following objectives:

1. to *inform and improve* the design of new e-Health technologies through studies of present clinical work practices
2. to *study changes* of clinical work practices before and after the implementation of new e-Health technologies
3. to *identify potentials* for new ways to organize clinical work practices - including potential labour savings - when implementing new e-Health technologies through studies of present clinical work practices
4. to *document* current clinical work practices for future research purposes through studies of present clinical work practices
5. to engage in *dialog* with health care professionals on current work practices

We have found that generally, video observation is most beneficial for studies of specific work practices within delimited clinical settings as trying to study a wide range of clinical work practice at a number of different clinical settings at once is extremely time consuming.

Within the healthcare sector, video observation permits us to explore *context dependent* clinical sociomaterial work practices including unforeseen interruptions and communication challenges. In a video observation study on the impact of the EHR on sharing information's between nurses at morning meetings, the nurses sought information's in two different EHR systems, while at the same time making handwritten notes at several schemes and other papers. The interactions between the nurses and the different artefacts went on extremely fast. When analysing the data, new insights were gained every time, we revisited the field through the recorded data [19]. Thus, the video observation method is capable of capturing real time and continuous activities and hence of providing data, which allow a study of interactions between health care professionals and technology. Besides, in contrast to personal observation data, data from video observation allow us time and again to revisit the observation site and gain new insights without having to physically return to the field.

In the same study [19], the impact of the EHR on the exchange of information's during ward rounds was studied. At the wards, a number of actions went on simultane-

ously: communication between the patient and the clinician's and between the clinician's themselves, decisions on new medication and treatments, different clinical measurements etc. When subsequently analysing the data, we recognized that our original focus on information flow was too narrow, because the EHR turned out to have a major impact on other aspects also, e.g. the organization of work. Thus, video observation has the advantage compared to personal observation that, despite the focus for the observation (by hand or video) is subjectively decided by the observer before or when the observation takes place, the recorded data are that rich that they embrace more than the initial focus. Compared to hand written notes, they can be revisited time and again presenting revised research questions.

When analysing the data from an explorative study on medical secretaries work practice before the implementation of the EHR together with the involved secretaries, it became obvious that during interviews and personal observations conducted previously, only part of this had been captured, partly because of the complexity, partly because of the routine and tacit nature of their work practice [3]. Thus, compared to data from personal observations, video data become a data repository allowing both contextual knowledge and the analysis process to be revisited and shared – and hence to be validated – with the involved clinical employees. Besides, the video observation method also allows other stakeholders insight into the comprehensiveness and complexity of clinical work practice.

4. Discussion

As it is the case with all qualitative data collection methods involving the researchers, video observation will not lead to the "truth" about how clinical work is practiced. However, data collected using video observation has many advantages in understanding how health care work is being practised. As with the hand written observation method, the video observation method allows you to a) be a fly on the wall – record what take place, b) follow the health care professionals and make them elaborate on their actions while in action or, c) display real time and place data to planner, designers, developers that otherwise would have no access to and insight in the complex clinical work practice. In contrast to the personal observation method, the video observation method permits the health care professionals to validate the data by accessing and discussing if the data recordings actually do represent their clinical work practices.

It is important for us to stress that our concern - when studying clinical sociomaterial work practices from a hermeneutical point of view - is to broaden our insight and understanding on the study settings from local situated work practices and individual instances. In more of our studies, we have video recorded work practises one day before and one day after the implementation of a new e-Health technology. This provides insight into concrete sociomaterial work practices and hence into whether the associated interactions between the health care professionals and the technology are in balance or dysfunctional. We are well aware of the fact that this does not provide a foundation for comparisons or for generalizations across settings or even within settings in the positivistic sense, e.g. to make claims of statistical significance from our results.

Compared to other ethnographical methods, video observation generates large amounts of data in a short period of time – both visual and audial – therefore, to avoid collecting irrelevant data, it is important to have a clear strategy for the study. Also, ac-

cording to our experiences, gaining access to video recording within hospital settings rest primarily on the study objective being clearly formulated and on the overall methodology being transparent, as this is the basis for convincing hospital management and IT-board that the study is worthwhile carrying through.

In conclusion, we have found, that the video observation method is superior to other ethnographical research methods when it comes to rapidly disclosing the complexity in clinical sociomaterial work practices. We have also found that video observation used in the healthcare context (at hospital-wards) allows us to revisit the field of observation through the data, to broaden our initial focus and to share data with both the clinical staff involved and other researchers. Hence, it provides us a more in depth insight in the complex clinical sociomaterial work practices than when observing by the use of pen and paper.

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