Application of the Multi-disciplinary Thematic Seminar Method in two Homecare Cases - A comparative study

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Abstract. A significant problem with current health information technologies is that they poorly support collaborative work of healthcare professionals, sometimes leading to a fragmentation of workflow and disruption of healthcare processes. 

Objective: This paper presents two homecare cases, both applying multi-disciplinary thematic seminars (MdTS) as a collaborative method for user needs elicitation and requirements specification. Methods: This study describes the MdTS application to elicit user needs from different perspectives to coincide with collaborative professions’ work practices in two cases. Results: Despite different objectives, the two cases validated that MdTS emphasized the “points of intersection” in cooperative work. Different user groups with similar, yet distinct needs reached a common understanding of the entire work process, agreed upon requirements and participated in the design of prototypes supporting cooperative work. Conclusion: MdTS was applicable in both exploratory and normative studies aiming to elicit the specific requirements in a cooperative environment.

Keywords. Needs Assessment, Human Factors, Change Management, Organization, Process, User-Computer interface, Collaboration

Introduction

Homecare staff requires both information at the point of care and insight into other care professionals’ work and documentation [1]. To develop ICT systems that actually support cooperation and coordination of homecare work, there is a need for a development process that focuses on the entire care process and all professions involved [2, 3], as opposed to conventional methods working with one care profession at a time.

To meet the demands from integrated healthcare organizations for design of new ICT systems, we have developed a multi-disciplinary thematic seminar (MdTS) method. It differs from conventional requirements engineering methods as it implies a thorough investigation of the entire interdisciplinary cooperative work, and it supports
rapid transformation of the agreed user requirements into technical specifications in order to develop appropriate ICT for the variety of occurring work situations.

To validate the method, MdTS was applied in two different homecare cases. This paper describes the various contexts and analyzes the differences of the application of the method.

1. Methods

The first author participated in both cases and could therefore describe the interventions and the contexts in which the interventions occurred [4] as an intrinsic case study (when the researcher has an interest in the case) [5] (cited in [6]). Sources relevant to the study were participant and direct observation, documentation and physical artifacts [4] e.g. the prototypes developed in the cases.

The MdTS method is based on established theories from the Human-Computer Interaction fields of Participatory Design (PD) [7, 8] and Computer Supported Cooperative Work (CSCW) [2, 9], and is thoroughly explained in [10]. In short, MdTS consists of a seminar series of twelve seminars with set themes (figure 1) and work was to be performed in multi-disciplinary working groups.

Two types of multi-disciplinary seminars were held; (1) intra-professional seminars where focus was on one healthcare profession, and (2) inter-professional seminars where the cooperative aspects of work were handled. Two perspectives of the multi-disciplinary work were covered in the seminars; (1) a holistic perspective aiming to reach a common understanding among the participants and a holistic view of the entire cooperative work process, and (2) a detailed perspective in which results from the holistic perspective were further elaborated. The detailed perspective included examining “points of intersection” and specific details for each profession, items that were necessary for development of a health information system supporting integrated care.

Figure 1. Thematic seminars performed in multi-disciplinary working groups.
The seminar series was preceded by pre-seminar work in form of field observations and interviews [11] carried out by health informaticians with knowledge in usability issues (i.e. HI-U specialists) [10, 12] at different workplaces to gain an understanding of the work performed and to capture users’ tacit knowledge.

Analyses of the users’ needs and translations into more technical specifications were performed by the HI-U specialists after every theme handled in the seminars. The structured analyses of the requirements were iteratively fed back to the multi-disciplinary working groups and agreed upon, as it was essential to validate the system specification during evolution. After every detailed seminar, the validated results, in the form of task analyses and use cases, were handed over to the developers.

2. Results

The MdTS method was developed in case 1, OLD@HOME, [13] and applied as an explorative study. All 12 themes were realized. In case 2, VIHO [14], aiming for normative results, the six holistic themes were applied (Table 1).

<table>
<thead>
<tr>
<th>Case 1: OLD@HOME</th>
<th>Case 2: VIHO</th>
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<tbody>
<tr>
<td><strong>Total project time</strong></td>
<td>Fall 2002- fall 2005</td>
</tr>
<tr>
<td><strong>Type of study</strong></td>
<td>Explorative</td>
</tr>
<tr>
<td><strong>Pre-seminar work</strong></td>
<td>17 days during 3 months, working within 3 professions</td>
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<tr>
<td><strong>Thematic seminar series</strong></td>
<td>6 months</td>
</tr>
<tr>
<td><strong>Seminars performed</strong></td>
<td>Holistic: No 1-6, Detailed: 7-12</td>
</tr>
<tr>
<td><strong>Hours/theme</strong></td>
<td>Holistic perspective: 1 day/theme, 8h</td>
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<tr>
<td></td>
<td>Detailed perspective: Each group worked for 4h/theme, c.f. iterations.</td>
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<td></td>
<td>Technical workshops lasted 2 days.</td>
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<tr>
<td><strong>Frequency of seminars and meetings between different professions in the project</strong></td>
<td>Seminars –every two weeks</td>
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<tr>
<td></td>
<td>“Homework” assignments in between, HI-U’s also had an office next to HHS</td>
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<tr>
<td><strong>Iteration of themes</strong></td>
<td>- No 9; Detailed information needs - Topic: integrated care planning</td>
</tr>
<tr>
<td><strong>Field work during the seminar period</strong></td>
<td>6 days, 2/each profession</td>
</tr>
<tr>
<td><strong>Participants in multi-disciplinary groups</strong></td>
<td>Participants from stakeholders as buyers/owners, project managers, operational services, (HI-U) designers, and developers and users [15]</td>
</tr>
<tr>
<td>(Start-up and progress presentation meetings)</td>
<td></td>
</tr>
<tr>
<td><strong>Participants in inter-professional working groups for holistic themes</strong></td>
<td>One group containing: 3 HHS (i.e. assistant nurses), 2 DN, 1 GP, 1 care planning specialist, 2 HI-U specialists.</td>
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<tr>
<td>(same people during the entire seminar series)</td>
<td>Other stakeholders received continuous progress reports.</td>
</tr>
<tr>
<td><strong>Overall outcome</strong></td>
<td>Evaluated working prototypes, a final prototype: the Virtual Health Record.</td>
</tr>
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Table 1: Comparison between the cases, OLD@HOME and VIHO
In Case 1, **OLD@HOME**, the objective was to develop prototypes for inter-organizational ICT systems in homecare in order to provide a seamless and consistent information and communication flow between different professions caring for elderly living in private homes. Two groups of care professionals from different care providers jointly participated in the seminars. Those were general practitioners (GP) and district nurses (DN) in a primary care group from the County Council of Gävleborg, and a home help service (HHS) group i.e. 14 assistant nurses from the municipality of Hudiksvall. Three of them participated in the seminar series, and the entire group tested the prototypes during a period of five months [13]. The primary care group consisted of seven members, GP and two DN participated in the seminar series while an additional four others (two DN and two GP) participated in testing the prototypes. In the inter-professional seminars, participants from all user groups were involved. The researchers (i.e. HI-U specialists) conducted all pre-seminar work, seminars and transformation of user needs and agreed requirements into use cases and technical specifications. Furthermore, a technical group was involved in coordinating technical infrastructure, architectural design, software development, technical implementation, and support.

The resulting system was evaluated in different ways, e.g. in a usability lab and through heuristic evaluations [16, 17]. In short, results indicated that information needed at the point of care was available to the users and presented in an understandable manner. Consequently, the MdTS method succeeded in elicitation of the correct user needs and in transferring the requirements to the system developers [1].

Case 2, **VIHO** in Kortedala, Göteborg, was a normative study, using a perspective of five years for envisioning work practices in homecare. Working ICT prototypes were not expected as result, but a proposal of future elderly care in terms of aspects of future work [18]. The VIHO working group consisted of five assistant nurses (three HHS and two working in an elderly care centre), and one homecare nurse. Four researchers, two HCI (human computer-interaction) specialists, a HI-U specialist and an expert in team work and organizations, provided input to the discussions and compiled the results for further reflections and analyses of the aspects of future work.

### 2.1. Analysis

Both projects resulted in valuable documentation on how cooperative work in homecare is currently performed and how it should preferably be performed in the future, as well as specific and detailed needs and requirements regarding information and communication handling in integrated homecare.

In case 1, extensive fieldwork was carried out, 17 pre-seminar days during 3 months containing work within three professions. Additionally, the HI-U specialists obtained an office in the HHS building and consequently spent an extensive amount of time with the staff, sharing their daily work problems at informal meetings or coffee breaks. This fieldwork was of great value for both projects. Understanding of current work situations, knowledge about problems and difficulties in cooperative work, as well as staffs’ thoughts about their work created a common ground and facilitated for communication between HI-U specialists, researchers and healthcare participants in both cases.
In both cases, the MdTS was conducted during a period of 6 months. Case 1, OLD@HOME, used the MdTS method to acquire and analyze user requirements in cooperative work with the objective to develop a virtual health record (VHR). As the results were iteratively refined in the second part of the seminar series, a working prototype of the VHR for integrated homecare was developed, allowing for information access and documentation at the point of care. [13]

In case 2, VIHO, the seminar work was considered finished when a prerequisite for requirements specifications for future work in homecare was accomplished. Case 2 iterated seminar 6, Future work perspective to finalize the work accordingly. Analyses were performed out of results from the holistic seminars and no analyses focused on details in order to develop a system, as in OLD@HOME. Accordingly, the total work load was lower in VIHO; staff participated in six holistic seminars and spent one day/theme. Case 1 needed more detailed descriptions about the information needs (no 9) and how the care planning process was performed. As required, case 1 performed much more detailed analyses. User requirements elicited in the holistic seminars were transformed into VHR prototypes and the conformity was verified in user tests, performed during the detailed phase of the seminar series. Consequently, additional time (4h/detailed seminar) was demanded.

When considering details in daily work activities studied in the two cases, the tasks contained few differences and on a general level the user needs specifications were in accordance. As a second case, VIHO validated the method developed in OLD@HOME and verified the results from the MdTS by briefly testing the prototypes developed in case 1. During development and evaluation of the prototypes, several flaws were found and adjusted, thoroughly described in [1].

3. Conclusions

MdTS is specifically adapted for cooperative work, to support gathering of requirements from different perspectives to coincide with different staff’s work practices. However, we consider the MdTS method to be generally applicable. It can e.g. be used for single profession analysis if the inter-care professional seminars number 8 and 10 are removed, and it can be applied to other domains than healthcare.

To develop a system that supports cooperation and sharing of patient information between different care professions, both the holistic and the detailed part of the multi-disciplinary thematic seminars are needed. For other purposes, e.g. activity and information needs analyses or normative studies, application of the holistic part is sufficient. Application of the method resulted in a holistic view of the entire work process achieved by the various participants and specifications of goals for future cooperative work and ideas of adequate ICT support. The detailed part specifically took into consideration the inter-care professional aspects of work and focused on details needed to develop usable HIS for cooperative work. The detailed phase was consequently regarded as mandatory as the objective was to develop an ICT tool, to ensure that it actually supported integrated care practices.

Despite different objectives, the two cases demonstrated that the method emphasizes the “points of intersection” and benefits both healthcare participants from different professions and system developers in the delicate phase of eliciting user needs and creating system requirements as well as ICT tools for integrated care.
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References