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### A case study on collaboration with clients, in community interaction and learning design

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# *Working Paper*

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**By**

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## Client Centred Design

### a case study on collaboration with clients, in community interaction and learning design

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#### Abstract

*In this paper the Human Computer Interaction (HCI) Research Group reports on the pre-phase of an e-learning project, which was carried out in collaboration with the client. The project involved an initial exploration of the problem spaces, possibilities and challenges for an online accredited Continued Medical Education (CME) programme at the Lundbeck Institute. The CME programme aims at end-users, which are primarily general practitioners, but also specialists (psychiatrist and psychologists), from all over the world. The assumption was that it would be possible to identify and build on resources and competencies already existing in the client organisation. We asked: What is it we know? Uncovering the prerequisites and background of and with the client allowed us concurrently to identify: What do we not know? Working iteratively in collaboration with the client, allowed us to build on existing resources and networks, suggesting a design, which also included end-users community needs and work-context. Our argument is that if a preparation phase both seeks to confirm knowledge and contemplate what is not yet known, giving attention to the context and need of the client (i.e. not only end-users,) then it is possible to build on existing resources within the client organisation, leading to grounding of design decisions and a match between the e-learning environment designed and the capabilities of the client.*

#### Keywords

Client centred studies, Preparation phase, e-learning, collaboration

#### INTRODUCTION – BACKGROUND AND MOTIVATION

We begin this paper with a short introduction to our case study and describe the issues which motivated us to look further into the concept of building on the clients current resources in design of e-learning environments.

The HCI group was contacted by the Head of the E-Education department at the Lundbeck Institute. The Institute is an independent educational subsidiary company of the Danish medical company H. Lundbeck A/S. It was our research on design and planning of e-learning and our experience as co-developers and lecturers of the virtual Master degree in ICT and Learning (MIL), which had caught the client's eye. The request was for a meeting to explore possible collaboration and to discuss "...a possible process for an e-learning strategy for..." the Lundbeck Institute educational area. This request was formulated in an e-mail in the spring of 2002.

The Lundbeck Institute stated explicitly and from the beginning that they wanted to collaborate with researchers - not with consultants from an IT-company, which developed e-learning systems. Over the following nine months the idea unfolded and resulted in a preparation-phase contract, known by both partners as the pre-phase. This pre-phase ran over approximately four more months, were Lundbeck Institute and the HCI group collaborated on the strategies and e-learning scenarios for Knowledge Acquisition / in Continued Health Education / in Computer-Human Environment. Thus became the name of the project KA-CHE.

The pre-phase resulted in a tangible product in the form of a report, describing the design scenarios as well as the issues identified and investigated. The aim of the report was to serve as basis for negotiating a project contract. It was also seen as a way of initiating discussions within Lundbeck Institute and the mother organisation H. Lundbeck A/S, with respect to the role of this e-learning project in the organisation. From the beginning, however, the HCI research group saw the process of working together with the client as being one of the main results of the pre-phase. Considering it a way for both partners to investigate the Lundbeck Institute's current activities and raise questions about what the Lundbeck Institute needs to consider when contemplating a relatively large e-learning project. So our work in the pre-phase and the resulting report do not contain a specific

design solution, rather it focuses on critical questions to ask and further steps to explore and investigate in order to benefit from the opportunities within an online (CME) programme at the Institute.

We would at this stage like to clarify our use of two concepts in the paper, both of which evolves around the concept of users, and the concept of user centred design. The users of the application / product developed are in the HCI literature either addressed with the broad term users, or more precisely as end-users. In more project management oriented HCI literature, the concepts of customers or target groups are often also applied. However, the term customer as well as the term client is in HCI literature also applied to the organisation, which have ordered the product being developed. To add to the confusion, the client/customer is also addressed as users of the product – as administrators etc.

The organisation, who commissioned the work, is known in this paper as the client. In our case study, the client is the Lundbeck Institute. We will also use the terms end-user and target group, but with a significant different meaning. We will refer to the term end-users, when we are dealing with issues that influence the specific (and also individual use) of an e-learning system. In this case study, the end-users are the general practitioners and specialists. However, we may also refer to this same group as the target group, as much knowledge can be derived from thinking about end-users as coming from a specific group of people (with demographic characteristics etc). We will later show how this particular and explicit differentiation between end-users and target group became important in our work in the KA-CHE pre-phase. But we start with a literature review showing that little attention is put on collaboration, through user centred design with clients in the pre-phase. Our argument is that if a preparation phase both seeks to confirm knowledge and contemplate what is not yet known, and if attention is given to the context and need of the client (i.e. not only end-users), then it is possible to build on the existing resources within the client organisation, leading to grounding of design decisions and a match between the e-learning environment designed and the capabilities of the client.

## LITTERATURE REVIEW

Whether as research case studies from practice or as more basic theoretical considerations in journals or textbooks and monographs, our studies show that collaborative methods to facilitate the design process by involving the client in e-learning projects are not well described. Our literature review is based on searching full papers online, and reading abstracts of approximately 750 titles found at the ACM Portal (<http://80-portal.acm.org.esc-proxy.lib.cbs.dk/portal.cfm>) and at Google (<http://www.google.com>). The keywords used in the search are: e-learning and HCI (human computer interaction) in connection with the keywords: client, collaborative, (end-)user, user centred design, practice, costumer and target group. Publications which contained some information about this particular perspective: collaboration through user centred design with clients in the pre-phase – and within e-learning projects, were selected and looked into in more depth. We are aware, however, that even though this focus is not easily found, it may indeed exist among researchers and developers. Our claim is that the perspective of involvement of clients in a collaborative pre-phase, building on client's resources and on the mutual learning process (between the client and the consultants/developers) in HCI development processes, is not well documented.

Bødker and Sejer Iversen (2002) states, that methods are often taken “off the shelves” rather than chosen on the basis of pre-analysis and grounded decisions. This also seems to be the case with HCI or related work which describes ICT development processes. There is a tendency to jump directly from an identified problem to working on solutions either with the perspective (i) to evaluate a specific method or tool, which the authors have developed or used, or with the focus (ii) to design and evaluate use of a specific product(s). Consequently, our review can be divided into two categories, with respect to the perspective taken in collaborative methods within e-learning:

- (i) Evaluation of methods/tools
- (ii) Design and use of products

### **(i) Evaluation of methods/tools**

Some case studies have the presentation and demonstration of a specific method as their focus. Therefore they do not deal with pre-analysis or choice among methods. However, this does not mean that we may conclude that the authors of our sampled papers, which do deal with e-learning HCI activities (e.g. Vass et al. 2002, Urnes et al. 2002, Iacucci & Kuutti 2002), are not aware of pre-phase issues; neither does it mean that they do not take these issues serious. It suggests that the authors' mission is to research and demonstrate the use of an already established or a new method/tool. Thus any consideration about whether it is an appropriate tool for the context at hand, is not considered in detail, i.e. questions as when the method/tool is generally applicable or where is it limited in use, are not part of the presentations. Recent surveys of the application of collaborative user-centred design practice and of HCI practitioners' use of methods and tools, claims that the most widely used methods and tools in HCI are usability test, simple prototyping and heuristic evaluation. That is, methods used in the

phases succeeding the initial pre-analysis and requirement analysis (Mao et al. 2001, Clemmensen and Leisner 2000).

In publications such as textbooks and monograph, the applicability of methods in the whole development process is often contemplated. For example, Beyer & Holtzblatt (1997) offer, with their Conceptual Design Approach, a method acknowledging that projects begin with an initial phase where the project focus is set, but the data collection methods are still a matter of decision-making. They also talk about costumers, but costumers as users of the future product, not as clients. Hence the involvement of the client as stakeholder and co-producer is not included in their method.

Cato (2001), however, takes outset in both project management and HCI and warns against the creation trap where clients too early in the process claim that: *“we know what we want; ‘don’t waste any more time exploring and understanding. Just get on and create it.’* “ (Cato 2001, p. 20). But the client is not involved as an active participant, and involvement of users is restricted to user tests, not collaborative initiatives.

Publications having their point of departure in project management of multimedia- or web projects have a better focus on the collaboration with clients, as well as establishment of clients’ needs and the context. However, the HCI aspect is almost absent. This literature deals with projects ranging from consumer products (games, e-trade) to e-learning (applications and environments) describing methods, similar to the collaborative methods of the KA-CHE project. These methods deal with the design and management of the processes, from the initial idea of a project to the final delivery. Examples are: the presentation of the MUST-method (Bødker, Kensing & Simonsen 2000), the Holistic Approach (Christensen & Harder Fischer 2004) and England and Finney’s reputed book on Managing Multimedia and Web Design (England & Finney 2002). The need for describing and documenting the involvement of the client is also stressed by a recent study in Sweden, which confirms that in practice, the client do in most cases participate as a co-producer in multimedia- and web productions (Molin 2002).

## **(ii) Design and use of products**

Papers describing practice from a product view, i.e. development of a specific application, rather than the evaluation of a specific method/tool, seem to lack in-depth discussions of collaboration with a client in the initial phases of an e-learning project, prior to signing a contract. General HCI papers documenting the involvement of users, as well as the identification of users needs, accomplish development of a product, through methods where the grounding of the choice among various methods, is not well discussed (e.g. Mikkonen et al. 2002, Granollers et al. 2002).

Even larger (in volume) publications, such as basic HCI textbooks, do not touch upon the preparation-phase prior to the contract. Again their focus is on the product rather than the processes leading to the product, and they only consider the more traditional issues of involving the client and/or users in the actual design process (e.g. McCracken & Wolfe 2004, Preece et al. 2002, Dix et al. 2004). A general approach in these types of textbooks is first to stress the importance of HCI and User Centred Design in terms of bad (and thus very convincing) examples and economic arguments. Then follows the definition of core concepts and the HCI methods are described. From the currently recognised theories about people, ranging from cognitive theory, learning styles to cultural theories, assumptions are made about users. User Centred methods are supposed to “answer the questions on the list”. Stakeholders are considered a wide group that has to be taken into account. However, the client is, unlike many multimedia development publications on project management not included, neither as a costumer nor as co-producer (Preece et al. 2002 p. 171; Dix et al. 2004, chapter 13.3). It is interesting that in this type of textbooks the involvement of HCI-experts begins from the point where the nature and purpose of the interactive system is already settled (McCracken & Wolfe 2004, p. 5).

This critique may even be directed towards our own publications addressing collaborative methods in pre-analysis phases. E.g. user centred design, and the development of the dialog design framework (Nielsen et al 2003); e-learning development in multimedia case teaching where roles of clients, customers and learners are considered (Orngreen 2002) and design of e-learning within workplace related training (Levensen 2003). Again, the primary focus of the publications is on involvement in the design process, not looking at collaboration with the client in a preparation phases, even though this has preceded the development project.

Only Grützner’s paper focusing specifically on e-learning production addresses collaborate methods of production and practice incorporating focus on client analysis as well as user involvement, but HCI issues are not directly apparent. (Grützner et al 2004). There are some case studies, which illustrates a close co-operation with a client throughout the development of an e-learning environment. Hewlett-Packard is one example, where the pedagogical and interaction design of content for HP’s Virtual University has been developed in close collaboration with the external producer (Nielsen 2002 and Hansen & Borup 2001). The Danish Rail and the Danish Army Officers School are other examples, where the organisations act as co-producers together with the external producer (Hansen & Borup 2001). A less detailed description of a similar approach is collaboration

between the client Danske Bank and the developer Maersk Data (Kypreos 2003), but without a HCI perspective. However, these examples differ from the KA-CHE project in one important aspect. The aim of their e-learning projects is in-service training and competence development of staff – thus the client/end-user relations are very different. When the above examples address end-users needs and context they inevitably also address the client's. The Lundbeck Institute in contrast, aim at external learners, such as specialists and general practitioners within the field of psychiatry. We have not found any publications corresponding to the KA-CHE project.

In conclusion, our perspective of client centred design, i.e. collaboration with the client in the preparation phase, is not well documented. Though there are literature, which touches upon the importance of such a collaboration in multimedia literature and project management literature, the view is either not learning or definitely from a stand-alone-application type (like multimedia CD-ROM training etc), and not involving the aspect of facilitating and administering humans interacting in communities of learning. In these publications the focus is also often from a “remember to be aware of this and this prior to signing a contract”, but do not discuss the process in detail. Literature on communities (like communities of practice in Wenger 2003) have not been included in the review, as they only discuss end-users and are seldom focused on the development process and never on providing any insight into what a mutual adjustment of expectations, negotiation of meaning and scoping of project (which were the KA-CHE aims) consist of, and how this may take place. Thus the need exists to clarify and describe our KA-CHE process and results based on practise.

## **TO KNOW AND NOT TO KNOW, THAT IS THE QUESTION**

The pre-phase was characterised as an iterative process initiated by a status-question: *what do we know*, immediately followed by an initiating-question, with an explorative nature: *what do we not know*. The process was iterative and allowed us to focus on new / not yet considered issues, which when having answered the status-question often led us back to the original issues, but with a different perspective and new initiating-questions. We do realise that iterations within a project, even within phases of a project is not unique. Our point here is that our work process considering client centred design in pre-phases is different.

### **How we worked - iterations through exploration and negotiation of meaning**

In all projects there is an element of working from explorative chaos to structure and mutual new understandings. In almost all our projects, the clients initial perception of what they want, their visions and needs, seems to the client to indicate a direct move towards specification of requirements and suggestions to solutions. However, we often find that the needs are very general, and that further investigation is needed prior to being able to contemplate the possibilities and challenges at hand. Hence, as the process of clarification unfolds, so does the role of the HCI research group. We become not only investigators and designers, but also sparring partner and facilitators of a process.

In the beginning the client and the researchers/developers are far from each other in terms of use of concepts, pre-understanding and subject matter specialisations. It is vital to recognise that the client have implicit and explicit knowledge about the context and needs of the project (often both their own and end-users). Our aim at the HCI research group is to create a common understanding and knowledge base. However, since none of the partners knows which concepts and themes that turn out to create this knowledge base, the explorative and consciously searching iteratively process of collaboration is a good starting point.

As such, KA-CHE was a typical project where the actual project contract is preceded by a process of clarification and negotiation of meaning. A common ground is reached through communication, and language is the dominant tool. In this process different interests are played out. The ideal is a process where use of language is oriented to mutual understanding, however as different interests and possibilities unfolds, the partners also engage in “openly strategic use of language” or “concealed strategic use of language”(Apel 1999 p. 273). Such a process proceeds and constitutes the many projects described in much research literature, however as we have pointed out, it is rarely discussed. In our process the client's contextual knowledge, needs and visions meet with the researchers' competences, scientific interests and experiences. We find KA-CHE special in the way that the Lundbeck Institute not only allowed for using a considerable amount of resources (financial and time wise) on a pre-phase, but also that the contact persons in the organisation succeeded to work in this very explorative manner and became collaborative partners. At times it was very frustrating for our contact persons, because neither they, nor we, were able to see where we were heading, and also because they were not use to working under such floating or drifting conditions. Yet they realised early on, the need for this exploration of areas of interest and allowed themselves to be engaged in and to be open to this process.

At the end of the KA-CHE pre-phase, we could see we had worked through the themes in an iterative manner, and those who turned out to have vital influence on our design considerations, were not the ones we would have foreseen if we had not questioned the knowledge we had in the project.

## How we worked – causality and interrelated themes

The themes or subject area that both partners worked with in the pre-phase influenced each other in complex processes and relations. Underneath we have illustrated two chronological examples of how themes guided our current focus and how new themes had an impact on our perspective on a previous, and that we were not able to foresee these causalities and interrelations at beforehand.

1) First example: from learning theories to complex understanding of clients and end-users needs and back.

From the beginning we found the contact persons at Lundbeck Institute open for a dialog on their e-learning perspective, of what learning is. While discussing learning, we – the HCI research group – learnt about and tried to understand the institute's current educational activities:

- *Seminars* are the spearhead of the Lundbeck Institute activities, which are weekly seminars held in Skodsborg, Denmark. Approximately 25 “top seeded” specialists participate each time. More than 1.500 people from all over the world have participated in such seminars.
- On-line activities: *CNS-forum* containing news and knowledge on evidence-based medicine in psychiatry and neurology. *Luinst.org*, is Lundbeck Institute's homepage containing information about seminars and other institute activities, as well as the drug database *Psychotropics*. Within the *Luinst.org* “meetings of minds” sessions, where experts discuss topics, has been arranged. *Brain Explorer*, an educational tool explaining the brain functions and disorders, aimed primarily at medical students, is accessible for the general public. *DepNet* is targeted at patients, family and friends as well as individuals, who think they may suffer from depression. It is a forum in which people can ask questions and receive answers from a panel of medical professionals, patients, a welfare worker, a clergyman and the Depression Association. The forum supports chat functions, exchange of experiences and contains information on depression.
- Other activities: Previous seminar participants are offered to participate in *network meetings* at conferences, receive *newsletters* etc. They are also encouraged to organise *local workshops* in their own region. *Booklets*, describing different subjects within psychology and neurology, where the latest edition is primarily targeted at General Practitioners (GPs).

In our discussions with the client about face-to-face or attendance learning, the contact persons found that learning was grounded in dialogue, learning from experience, practice and new knowledge in the field. The seminars were mentioned as the good examples of having people meet in dialogue – sharing knowledge, discussing new theories, as well as meeting the crème de la crème of the field in a “meet the expert” dialogue - session. As a contrast, the type of learning that the contact persons pointed out as examples of good e-learning, was very subject matter driven (new knowledge, new facts, high-end professors giving lectures...) and at a level of awareness creation or dissemination of knowledge. It was not learning, where the priority is on providing “real and valid” information.

We knew from experience that this kind of discrepancy between attendance and online learning was often seen, but also recognised that though we were HCI, learning and e-learning knowledgeable, we knew little about the medical area and thus CME in practice – and so a mutual learning process began. To increase our knowledge within CME specifically, we investigated the journals including CME initiatives and the CME sites available. Here we learnt that a continuing educational activity could be to read an article and answer a questionnaire. One could even gain accredited points for this kind of activity, with no direct contact to a human educator or even a validation mechanism checking whether the answers in the questionnaire were reasonable. This gave us insight into the history and culture of CME, as well as a clear indication of how CME traditions and accreditation points was carried over into new media. During our evaluation of on-line CME activities, we presented the client with some examples that showed different media usage and pedagogy, which all were based on a “know the content by heart” behaviouristic paradigm. We do not claim that there is anything wrong in reading new information. However, it is doubtful whether just reading/ seeing and/or hearing information, really make a difference in the daily actions of a GP. One of our examples showed how it was possible to gain points very easily, without going through the material in the e-learning application and without any knowledge what so ever about this field.

The examples served as an eye opener for our two contact persons at the Lundbeck Institute, as they saw how easy it was to obtain accreditation if one wishes to, and also how little learning might take place in the process of gaining the accreditation points. These examples were later used by our contact persons internally in the organisation at a meeting, where it too created an unpleasant surprise, which gave cause for reflection. The examples were a god initiator of a discussion of for example: Should it be possible to fail (not to pass) an activity at the Lundbeck institute e-learning programs? What is learning and how do we design for learning at the Lundbeck Institute, both in attendance and online learning situations?

This again led back to a discussion on the official criteria's and procedures for accreditation, but also or as well as a dialog on the target group. We knew that the Lundbeck Institute wanted to focus on GPs as a "new" target group, i.e. a target group, which had not yet been focused on until recently in the Lundbeck Institute activities, but how did they envision motivating the GPs to use e-learning. How could GPs be reached and motivated as end-users, and what if they designed a similar kind of product, as the examples, what would the consequences be, considering the kind of value a bad e-learning program could have (backfiring on the other activities and reputation of the Institute)? Regarding getting the target group to use the program; E-learning cannot be implemented and expected to live a life in its own – neither with respect to getting people to attend, nor with respect to maintenance etc. These were questions and issues, which the Lundbeck Institute had not thought much on, prior to our involvement in the pre-phase. Main remarks from the Lundbeck Institute about for example administration were a kind of: this must be tasks of the subsidiaries (i.e. the local organisations of the mother organisation). They did not contemplate, how much work this could be, depending on the type of learning model chosen, involvement of facilitators/teachers in learning activities, of knowledge sharing activities etc.

## 2) Second example: from target groups, to end-users and design, and back to the client's needs and context

When we first were introduced to the task, the development of an e-learning project, the target group was pointed out to be GPs and specialists, and in particular the first group. The Lundbeck institute saw GPs as playing an important role in the first diagnosis of patients, but the client also found that GPs as in contrast to specialists may not possess up-to-date information and knowledge about psychiatric and neurological diseases in particular depression. At the same time GPs have a need for accreditation points in order to keep their licenses. By investigating and talking to the accreditation committees, we found that this is true already in some countries (i.e. Australia, Belgium, Canada, Czech Republic, Germany, South Africa, UK and US) and will be in the near future in the EU. The Lundbeck Institute had prior to our involvement in the project, formulated what they called the 7C's. The 7C's covers features, which the e-learning programme should accommodate: *Content*, up-to-date, high quality and relevant; *Convenient*, whenever, wherever; *Continuous*, tracking progress; *Collaborative*, content provider/physician and physician/physician; *Customisable*, addressing unique needs; *Case-based*, relevant and practical content and; *Credits*, ensuring the courses are accredited, where applicable.

A target group report focusing on for example e-literacy skills had also been made prior to our involvement into the pre-phase. The report was made by a medical marketing/information broker for the Lundbeck Institute and was based on statistical calculations, from large quantitative surveys in a vast number of countries. In the HCI research group we found that exploration and analysis of the end-users in their context was also needed. We simultaneously found that exploring the Lundbeck Institute's knowledge of and expectation of this target group would provide us all in the project team with important insight.

The types of arguments we have met in the Lundbeck Institute when validating the need for e-learning, are based on segmentation or a target group perspective. These types of data are vital when determining the target groups and their needs in relation to the buying and motivation process of a product/service (here e-learning environments). Traditionally it is factors of cultural, social, personal and psychological nature that has been used when trying to determine the way target groups may behave in a buying process (Kotler 2002). The Lundbeck Institute knows quite a lot about the specialists due to their current activities. They also have experience in reaching hospital and private clinics healthcare personnel via the local workshops. Now, the Institute is contemplating to expand from specialists to GPs and from hospitals and private clinics to general practises, and there are large differences between these two groups, a fact which was not obvious for the client.

The HCI research group presume that the specialists represent a very qualified group within the subject area, with a work related motivation from the beginning, and they may also have research interest in the topics presented and discussed in a future e-learning environment. GPs on the other hand, have a more broad perspective and need to keep them selves updated on a number of subject fields, thus the Lundbeck Institute may find that they are competing with several fields within CME. The awareness creating and dissemination strategies, i.e. activities that make the target group aware of the Lundbeck Institutes e-learning programme existence are not a trivial matter. The buying process or the decision-to-buy process are quite complex when it comes to information communication technologies as a e-learning product, compared to more trivial industry products as food, clothes or even medicine etc.

An e-learning project as it is envisioned in the 7C's and the more challenging learning models (compare to the accreditation and learning model discussion in the first example) can be viewed as an innovation within the online CME area. As such Rogers (1995) famous curve showing a percentage distribution of the diffusion of any innovations point out that some people have a later adoption of innovations than others, here only 2,5% are innovators and 13,5 early adopters. (Figure 7-2, p. 262 in E. Rogers 1995). However, these are the factors Kotler (2002) and Rogers (1995) ascribe to influence in a buying process, and though factors within these may be



determining for the Lundbeck Institute with respect to which implementation strategy should be used, there are other factors of relevance to the end-user context.

The end-user factors are related to design and system requirements, where one has to clarify the problems of the e-learning project and identify future use situations. The design of a system has to fit its end-users, and here the concept is a much more refined term than just knowing the social status of ones target group. An end-user is an individual with a particular learning style, interaction / communication preferences, with a way of acting and being and working and living.

As the Lundbeck Institute, through our analysis and questions, realised the more complex information needed about the GPs, they clearly signalled that they expected the pre-phase would provide more knowledge about the end-users. Particularly in the beginning of the process, they believed that we in the couple of month's time would be able to plan and carry out user studies in at least two countries and gather these in a kind of requirement specification. We tried to clarify that prior to using extensive resources on user studies, it is vital that we (both us and the client) had to know more about background, possibilities and constrains of the e-learning project, but this was clearly a point of frustration and a feeling of unredeemed results from the clients point of view.

At the working meetings with the two contact persons, and later also in the interviews with other people at the Institute, a figure known as *the cascade* was time and time again mentioned as illustrating the Lundbeck Institute success. The cascade is a triangle, with the general population at the base followed by the general practitioners, then specialists placed above followed by a faculty and finally the board of the Lundbeck Institute on top. The Lundbeck Institute mentioned the seminars and the participants continuing local activities as major contributors to reach further down in the cascade. However, though the HCI research group learned that the Lundbeck Institute knew a lot about who attended the seminars, little was known about the diffusion taking place further down in the cascade.

A survey had been made giving data about the number of specialists organising local workshops, the number of workshops held by each participant, and the number of people participating in them. But it did not show, who the participants are, whether there is achievements of better diagnosis and treatment for patients after the seminars and local workshops, and if there is a diffusion of knowledge from seminar participants to the rest of the cascade. However, the survey did show that quite a large number of the people responding are interested in conducting such local workshops. These findings suggest that it is worth while investigating if the organisation of workshops could be enhanced, a possibility the client had not considered in an e-learning perspective. For example the HCI group asked, if some participants might be interested in facilitating learning activities in the e-learning environment or in arranging attendance workshops in their local region, thus supplementing the e-learning activities and creating a basis for sharing knowledge.

These were questions not even Lundbeck Institute knows the answer for. They need further investigation before too many assumptions about the diffusion effect of the cascade is believed to be of use. These questions also opened for more immediate questions about local workshops, such as: What is taught by the previous seminar participant? Which kind of message is given to the participants? Who are the participants? Is the desired effect visible / measurable? How can we get information about this? etc. They also made us look more into the seminars per se, as they made us ask: We do not know how people attend the existing seminars – how are people “recruited”? What is important for the Lundbeck Institute? Which role does the faculty play in the seminar? etc.

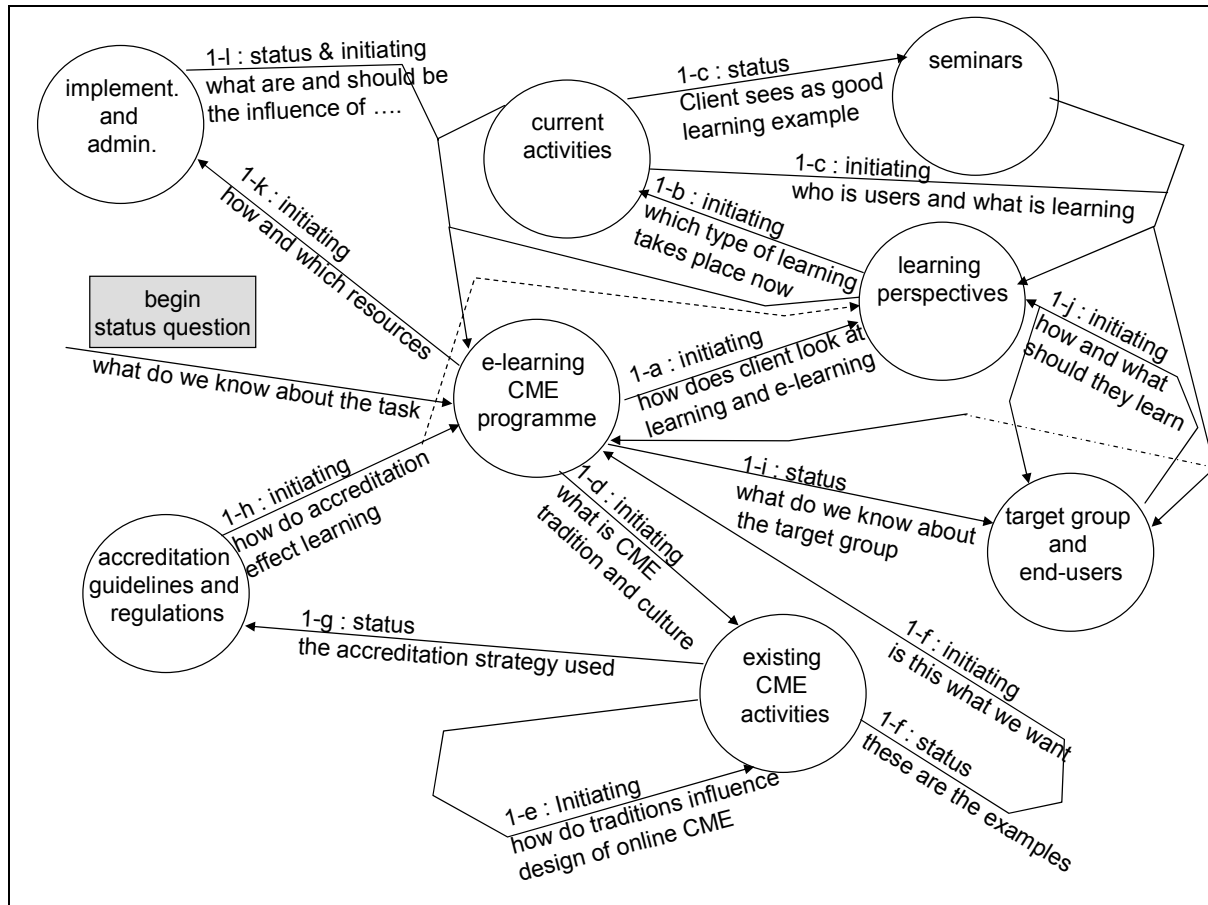
Through all these questions along with a clearer picture of the dissemination possibilities, we also got a clearer picture of the seminars and the amount of money it costs Lundbeck Institute and particular the mother organisation and subsidiaries to arrange seminars (for travelling and accommodation expenses). This made us wonder how the e-learning project should be administered and financed. One thing is the development costs and investments, but how did the client look at continuing support of the learning process and the administration for a considerable larger group of people than the 1.500 having attended a seminar? Lundbeck Institute hadn't considered this at all, and did not realise how big and complex a task running e-learning could be. Their first ideas thus were to have a self-running system (similar to the “bad examples” of online CME applications we had found), with any additional costs put on the subsidiaries side. So we ended our collaborative work with a report showing the vast number of dissemination and design possibilities building on the clients own context and community networks (including many possibilities and challenges for interaction not mentioned here), but also illustrating the complexity of e-learning and understanding of end-users. We even showed how going for a very small stand-alone, cheap solution might be worse than not doing anything; as such a solution might turn out to be counter-productive.

## **ITERATIONS BY VALIDATION OR EXPLORATION**

The initial task was from the client perspective quite clear – to begin working on an e-learning CME programme, that is Cato's creation trap (see the literature review). We, the HCI group, pointed out for our selves

that we lacked knowledge about the clients' internal activities and work-processes in relation to this new e-learning project. We first thought that we would use the major part of our resources in the pre-phase on understanding the learning systems in collaboration with the client. That is, the existing seminars (i.e. which learning model are used? what do participants learn? etc) and new e-learning theories. However, through a gradual unveiling process, it turned out to be equally relevant to acquire a more general (not rooted in learning) knowledge about the seminars (i.e. how people attend, who pays and administer etc.) and about the CME activities, accreditation guides and regulations.

The figure below illustrates the complex relations and meanings created in our work process. The notation used, correspond to example 1) marked 1-a to 1-k, showing both status and initiating questions posed.



Ever since the first waterfall development model saw its light in 1970 (according Preece et al. 2002, p.187), a critical movement towards more iterative processes have been prioritised. However, even an iterative version of the waterfall model and more end-user centred models as the star model (Preece et al. 2002), all focus on *go back to or return to previous activities*, thus risking to confirm assumptions and validate knowledge uncritically, on the basis of the generated output. Our argument is that inherent in such a circular movement of validating the knowledge known is the possibility of not bringing forward new issues of relevance. The consequence is a risk of aiming at a design, which the client cannot be geared for. A focus on validation rather than exploration in the pre-phase does not fully recognise, that perhaps there are already in the organisation ways of working, which contains inherent possibilities or that validated knowledge may when viewed from another perspective give reasons for concern, as was the situation with accreditation strategy and its influence on the learning strategy in the KA-CHE project.

At meetings, the Lundbeck Institute expressed that they knew what was asked for with respect to accreditations, as they had contact to relevant accreditation committees and as some of the seminars were accredited and others were about to receive accreditation. However, because of our work with existing online CME activities, we saw that there were some areas, which were unclear to us. Through our analysis we realised that there were much more to the accreditation issue than just regulations about how to get an accreditation. Thus, the accreditation strategy chosen by the client, could have significant influence on the learning models and the design of the e-learning environment (compare to the questions raised in the first example). With this new perspective in mind, we found through reviewing the regulations for accreditation, that other questions, like commercial independence became a more and more prioritised subject for the accreditation committees – not only was

product independence a requirement at this point, but also commercial medical company independence seem to become a requirement in future accreditation regulations.

## CONCLUSION

All the critical issues, which we have uncovered during the KA-CHE pre-phase, would not have been uncovered, if we had not moved from status to initiating questions, uncovering what we did not know in collaboration with the client. During this process of inquiry we avoided just confirming knowledge already known, and thus also avoided that these critical issues would pop up as serious problems too late in the process, when the solution already had been decided upon and production set to work (compare to our findings in the literature review).

By explicitly uncovering the unknown, we constitute a forward movement that increases (both broadening and deepening) our reference point, rather than validate the existing knowledge, thus continuously creating a new foundation for the future work in the project. This may not necessarily be a foundation, which automatically leads to better products (that we cannot measure and therefore cannot conclude), but one which is grounded in a better understanding of the clients needs and context. We do believe it is a basis, which because of its grounding in the clients existing resources and on a mutual understanding of the project, results in a better match between the project and the client organisation abilities, competences and needs.

However, a risk or concern with the client centred design approach in pre-phases is that the client does not feel that there are any real measurable results of the pre-phase. Despite collaboration with the client, or perhaps even particular due to collaboration, the client may feel they use a tremendous amount of resources without gaining any real results. As mentioned the Lundbeck Institute, particularly in the beginning of the process, had thought we would produce a sort of requirement specification and later hoped for user studies. Instead they got loads of questions, but also very interesting design suggestions, which evolved around learning and dissemination scenarios, which were build on their existing networks of communities.

In conclusion we see the iterative explorative process, constituting a forward movement as a mutual learning process, where the argument is that there exist resources within the company, which the project can be build on.

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